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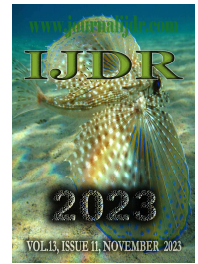
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RESEARCH ARTICLE

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## THE RELATIONSHIP BETWEEN ELECTRONIC MEDICAL RECORDS AND DETECTION OF INFECTIOUS DISEASES

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### ABSTRACT

**Background:** Epidemics are an unexpected, often sudden, increase in the incidence of a particular disease within a community or region. A pandemic occurs when an epidemic spreads throughout the world, crossing international borders and affecting large numbers of people. Epidemics and pandemics can be prevented and mitigated by predicting their occurrence well in advance, so medical records can be considered one of the tools through which an epidemic can be predicted. **Aim:** The main aim of the current study was to investigate the relationship between electronic medical records and detection of infectious diseases. **Methodology:** Prospective, cross-sectional, and descriptive study was conducted to healthcare providers (n=150) who filled the questionnaire sheets among healthcare institutions, Kingdom of Saudi Arabia. The questionnaires were comprising two sections, Socio-demographic information and Perception of participants about role of electronic health records. **Results:** Most participants (76.0%) believe that the quality of EMRs has a positive effect on predicting infectious diseases, as well as A large majority (80.7%) feels that Electronic Medical Records facilitate easy access to information about the incidence and prevalence rates of infectious diseases. In addition to, majority of respondents reported easy, support information, sustainable, high quality, accessible, and updating of electronic medical records. **Conclusion:** the healthcare providers had a positive view on the importance and effectiveness of Electronic Medical Records in predicting infectious diseases.

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## INTRODUCTION

Hospitals and Medical Centers every munity fight the infectious disease in emergency department and due to the urgency of patients condition sometimes the health care provider in ER successes and fails in their Nobel missions. In recent years, more and more of health care providers are using electronic medical record (EMR) systems. They were becoming a valuable resource for a wide range of research projects, including analysis to identify patients at higher risk for complications or who are better candidates for treatment (Shickel et al., 2017). Though out our research and site visit to ER department we can summarize the issue in one-word Swiftness in health Care, what I mean by that Doctors and Nurses in emergency department consumed long time to predicate and diagnose the case of the infected patients to let them apply the proper treatments. Disease surveillance's unit ability to predict, forecast, and control outbreaks is extremely

important. Automated case detection based on electronic medical records can cover a large population and has a significantly shorter delay than traditional laboratory reporting and physician reporting systems. However, a large training dataset for modeling may be required for the development of an automated case detection system, which is not available in all regions (Guha & Kumar, 2018). Therefore I am working build research to find out the opportunities and challenges in utilizing electronic medical records for infection surveillance, prevention, and control the infectious disease, which I think this will contribute to accelerating the recovery of patient health state.

### Research Questions:

The main research question is:

What is the relationship between electronic medical records and detection of infectious diseases?

Based on the main research question, the branched research questions are as the following:

1. How to predict infectious disease earlier through EMR and efficacy of information technology tools?
2. What are the most effective information technology tools and strategies that can be used to support swift decision-making in the emergency department when dealing with infectious diseases?

**Research Objectives:** The main aim of the current study was to investigate the relationship between electronic medical records and detection of infectious diseases.

Based on the main aim of current study, the branched aims as the following:

- Assess the ability to predict infectious disease through EMR and efficacy of information technology tools.
- Evaluate the effective information technology tools and strategies that can be used to support swift decision-making in the emergency department when dealing with infectious diseases??

**Statement of the problem:** Epidemics are an unexpected, often sudden, increase in the incidence of a particular disease within a community or region. A pandemic occurs when an epidemic spreads throughout the world, crossing international borders and affecting large numbers of people. Several infectious diseases can pose major health threats at the local, regional, and global levels, leading to outbreaks of epidemics or pandemics. Epidemics and pandemics can be prevented and mitigated by predicting their occurrence well in advance, so medical records can be considered one of the tools through which an epidemic can be predicted. The slowness impact on dealing with infectious disease in Hospitals and Medical Center's Impact negatively patients' lives due to the lack of Quick decision making on patient cases.

**Significant of the study:** The COVID-19 pandemic has highlighted the risks of major disease outbreaks and stressed the unpreparedness of countries to combat them. Pandemics are pandemics of severe diseases that affect many countries and pose health, social and economic risks on a large scale. The spread of a rapidly transmitted infectious disease across the globe could kill tens of millions of people, disrupt economic life, and destabilize national security, just as the Corona pandemic has shown. Climate change, urbanization, and lack of water and sanitation services are all factors that may contribute to the spread of catastrophic, rapidly spreading diseases. The COVID-19 pandemic unleashed a wave of global shocks with severe health, economic and social consequences that will affect many countries for years to come. Pandemic preparedness and disease surveillance, based on strong health systems covering everyone - especially the most vulnerable - is critical to ensuring better protection against major disease outbreaks. Ensuring preparedness for epidemics through several tools such as electronic medical records in health care systems ensures preparedness before the onset of disease. This Study investigated the problem from different angles we can summarized it as Predication of infectious disease, Act Swift on infectious disease and working to contain the infectious disease by Using Electronic Medical Records and of information technology tools.

## LITERATURE REVIEW

**Healthcare:** Health care services are the total services and public and private institutions provided by the state to take care of the health of its citizens, whether in its own sector or within the private sector, and it is entrusted with approaching the patient. It includes all hospitals, clinics, pharmacies, and human resources including doctors, nurses, medical device engineers, technicians, researchers, and everyone who works in this field. It encourages industries that support medical

services, such as the manufacture of medicines, devices, and others. It also includes medical research and education and creates opportunities for successive generations to support this sector (De Vries & Huijsman, 2011). Access to health care may vary across countries, communities, and individuals, and is greatly influenced by social and economic conditions as well as existing health policies. Countries and jurisdictions have different policies and plans regarding personal and population healthcare goals in their communities. Health care systems are organizations established to meet the health needs of the population. According to the World Health Organization (WHO), a well-functioning health care system requires strong financing, a well-trained and adequately paid workforce, reliable information on which to base decisions and policies, and maintenance of health facilities to provide quality medicines and devices (Yuehong et al., 2016).

**Medical Records:** The terms medical record, health record, and medical chart are used somewhat interchangeably to describe the systematic documentation of a patient's medical history and care over time within the competence of a health care provider. The medical record includes a variety of types of "notes" entered by healthcare professionals over time, recording notes, administration of medications and treatments, test results, X-rays, reports, etc. Maintaining complete and accurate medical records is a requirement for health care providers and is usually implemented as a prerequisite for licensure or certification (Boonstra & Broekhuis, 2010). The terms are used for the written (paper notes), physical (photo-film) and digital records that exist for each individual patient, and for each set of information contained within them. Recently, the Health Information Technology for Economic and Clinical Health Act appeared to incentivize the conversion of paper medical records into electronic charts. While many hospitals and doctors' offices have since implemented the concept, e-health companies' systems haven't always been compatible, and countless patients undergo repeated procedures—or fail to receive them altogether—because essential parts of their medical history are missing (Menachemi, & Collum, 2011). Because many people consider the information contained in medical records to be sensitive private information covered by the possibility of privacy, many ethical and legal issues are responsible for protecting it, such as third-party access and proper storage and disposal. Medical records are generally the property of the health care provider, and in most jurisdictions the actual record is the property of the patient, who can obtain copies of it upon request (Boonstra & Broekhuis, 2010).

**Electronic Medical Record:** An electronic medical record is a medical record in digital format. Electronic medical records in health informatics are one and the same forms of electronic health records, but in general usage these two terms are used as synonyms (Azaria et al., 2016). Medical records, or what we call the patient file, are one of the focal points on which the process of providing health care depends within hospitals and between various types of medical institutions. Treatment, follow-up reports, and important medical decisions. For decades, the nature of medical records remained constant in the form of a file or a group of papers on which information was written by hand, until during the past forty years, massive developments in information technology sciences - one of the most advanced and most influential human sciences in human life - led those developments. Scientists and specialists in the field of health care and information technology work together to design and invent electronic medical records based on the computer with all its advanced capabilities of storing information, processing, and transferring data through what we know today of information networks and modern means of communication (Denny et al., 2013).

**Development of Electronic Medical Records:** The process of developing medical records - before it reached its modern form - went through many stages, perhaps the first of which was the ancients' use thousands of years ago of papyrus and leather manuscripts to record their medical notes about surgeries they were performing or medical prescriptions they used in the ancient Pharaonic and Chinese civilizations, and he also Arab and Muslim scholars in the early tenth

century AD - in addition to the great medical references they created - wrote down their medical notes about patients, their ailments, complaints, and the medicines used in their treatment. The medical record depends on the patient as an independent, self-contained unit around which health care operations and activities are centered. By the middle of the nineteenth century, most doctors in the world were recording their patients' data and observations in the form of annual volumes containing patients' files arranged alphabetically. At the beginning of the last century, the idea of establishing a special section for files appeared. In hospitals, its employees arrange and save files and provide doctors and researchers with what they need during their work (Tang, & McDonald, 2006).

**Functional Components of Electronic Medical Records:** As a result of the connection of electronic records and the integration of their content with hospital information systems and their various services such as laboratories, diagnostic radiology departments, pharmacies, various treatment methods, multiple surgeries, etc., these records have become a center of strength in providing health care and assisting the doctor in performing his work better, as they provide all information. The medical information of the patient in an integrated and consistent form, and the difficulty of this task appears in light of the tremendous growth in the quantity and quality of medical information and the diversity of its sources. This information is no longer just verbal and descriptive texts of the patient's condition or the development of his recovery. Patient data and medical information today include complex numbers of results of blood analyzes, hormones, enzymes, compounds, diagnostic x-rays, images of body parts – such as X-rays, sonar, CT scans, and magnetic resonance imaging – and video studies of organ functions such as electrocardiograms, TV rays, films of arterial catheters, films of endoscopy of the digestive system, and others (Bowman, 2013). These electronic records were also provided with the possibility of creating and linking the doctor's multiple instructions, such as analyzes he requests for the patient, medications he prescribes for him, or various procedures he determines, and these instructions became integrated and related to the department for their implementation, for example, as soon as the doctor determines the type of analysis required to be performed by writing it in the patient's electronic medical record – while he is sitting in his clinic or next to the patient's bed – the laboratory department receives confirmation that this analysis has been performed and a determination of its nature and the type of sample to be taken, so the specialist goes to take samples from the patient, then the sample is analyzed and its results are recorded in the patient's record automatically, and once those results are received to the patient's record so that an alert process begins for the arrival of new information, so the doctor can verify immediately and without wasting any time the results of the analysis he requested and what is related to it from the opinion of the analysis consultant about the nature of the results and the meaning of each of them, and the same is the case with the rays, pictures and others, which are also accompanied by a report. It is written by a consultant radiologist, so that the doctor can review the images of those x-rays, as well as read the specialized report and find out its opinion and recommendations (Baumann, Baker, & Elshaug, 2018).

**Uses of Electronic Medical Records:** Information contained in the medical record allows health care providers to determine a patient's medical history and provide informed care. The medical record is a central repository for planning patient care and documenting communication between the patient and the health care providers and professionals who contribute to their care. The growing purpose of the medical record is to ensure documented compliance with institutional, professional, or governmental regulations (Jha et al., 2018).

**Components of Electronic Medical Records:** Although the objectives of both traditional and electronic records and their functions are quite similar, they - as we mentioned - differ completely in the way of achieving and achieving these goals. It is guaranteed by the electronic nature of that information, and the stage of entering data and information and transferring it correctly and accurately to computers is one of the most difficult and important steps for creating electronic

records and continuing their work properly. Everyone agrees that the responsibility for entering medical data into traditional records is distributed to all participants in the process of providing health care in a routine, usual and automatic manner, which does not apply to the process of entering data into electronic records, which depends on two independent stages, the first is the stage of data acquisition, identification and definition to become relevant Scientific value, and the second is the stage of entering that data, which requires effort and time to enter it as verbal texts, numbers, codes, or a combination of all of that (Kalra, 2006). Once medical information is recorded on computers, it becomes viewable in more than one way to suit many purposes. For example, recorded medical data can be displayed in the form of time-sequential tables to link medical events and their details with other procedures, operations, and instructions, which we find extremely important while caring for cases. Critical care in intensive care rooms requires following up the patient minute by minute, moment by moment, and comparing his condition with the results of periodic vital analyzes. On the other hand, the doctor may need to review the results of a patient's examinations that he had previously conducted weeks or months ago to be able to determine his response to treatment when visiting him again. Medical information can also be presented in the form of a summary or a brief report to determine a patient's condition or to decide his final treatment plan. Information can also be presented in terms of specific words used for research or in an indexed form according to the type of examination or analysis that was conducted, or in terms of other information (Jensen, Jensen, & Brunak, 2012). The great benefits of digitally recording medical information appear when we find ourselves needing to search for a specific piece of information among thousands of data, or to recall specific data for a patient based on specific medical or administrative data. These search systems can be used to define and identify groups of patients based on certain characteristics during a procedure. Scientific research and studies, as in medical statistics, epidemiological reports, and others (Kalogiropoulos et al., 2009).

**Content of Electronic Medical Record:** Medical records were traditionally written on paper and kept in folders often divided into sections for each type of note (note progress, ranking, and test results), with new information added to each section in chronological order. Active records are usually located at the clinical site, but older records are archived outside (Rajkomar et al., 2018). The advent of electronic medical records has not only changed the look of medical records but has also increased the accessibility of files. A personal medical record is used in the file style, in which records are maintained for each patient by name and type of disease at Mayo Clinic due to the desire to simplify patient tracking and allow for medical research. Protecting medical records requires security measures to prevent unauthorized access or tampering.

**Biography:** The medical history (medical history) is a long record of what happened to the patient since birth, in which diseases are recorded, including major and secondary diseases, as well as developmental milestones, and it gives the doctor knowledge of what happened to the patient previously. As a result, they often give clues to the current medical condition. Histopathology includes several sub-groups which are detailed below (Jensen, Jensen, & Brunak, 2012).

**History of Surgeries:** Surgical history is the history of the patient's surgery. It can contain operating histories, operating reports, and/or a detailed notation of what the surgeon did (Jensen, Jensen, & Brunak, 2012).

**Obstetric Date:** Obstetric history records previous pregnancies and their outcomes. It also includes any complications that occurred with these pregnancies (Jensen, Jensen, & Brunak, 2012).

**Medications and Medical Allergies:** The medical record can include a summary of the patient's current and past medications, as well as if they have any medical allergies (Jensen, Jensen, & Brunak, 2012).

**Family History:** The family history notes the health status of close family members as well as the cause of death (if known). It can also

record diseases that are common in the family or that are present in one or both sexes. It may also include a pedigree chart. It is a valuable feature in predicting some outcome for a patient (Jensen, Jensen, & Brunak, 2012).

**Social History:** A social history is a record of human interactions, and tells us about the patient's relationships, career and training, and religious direction. It is helpful for the treating clinician to know what types of community support a patient can expect when experiencing a severe illness. It may explain the patient's behavior in relation to illness or loss. It can also give clues about the cause of the disease (eg exposure to asbestos at work) (Jensen, Jensen, & Brunak, 2012).

**Habits:** Various habits that affect health, such as tobacco use, alcohol consumption, exercise, and diet, are codified and often part of social history. This clause can also include deeper details such as sexual habits and sexual orientation (Jensen, Jensen, & Brunak, 2012).

**Immunization Date:** This includes the medical vaccination history. Any blood tests that provide evidence of immunity will be included under this heading (Jensen, Jensen, & Brunak, 2012).

**Growth Chart and Developmental History:** For children and teens, charts documenting growth compared to other children of the same age are included, so health care providers can track the child's growth over time. There are many diseases and social pressures that may affect growth, so height charts may provide a clue to an underlying disease. In addition, the child's behavior (eg timing of speech, gait, etc.) compared to other children of the same age is documented in the medical record for the same reasons as development (Jensen, Jensen, & Brunak, 2012).

**Electronic Medical Record Challenges:** Although many commercial medical information systems produced by specialized companies already operate in many medical institutions, they do not fully match the specifications of electronic medical records required, as they do not actually support the concept of integration for which the idea of these records was created, but hope it persists in the further development of hardware and software technology, as the capacity of those systems to process data doubles approximately every two years (according to Moore's Law) and software applications evolve to increase ease of use and provide more decision support (Miotto et al., 2016).

The challenges faced by medical record systems can be summed up in five main points:

- 1- The need of users for information, which is one of the basic elements that guide the process of developing systems. Experience has shown that successful systems have been developed either by or with the help of doctors and health care professionals, as the rapprochement between the developers of these systems and between doctors and specialists provides a deeper understanding and a more comprehensive understanding. What the medical care delivery process needs has characteristics regarding the nature of the information and how it is used (Jensen, Jensen, & Brunak, 2012; Miotto et al., 2016).
- 2- Ease of use, which is also one of the most important elements that help doctors and specialists to use information systems without obstacles, and system developers must take several points into consideration, the most important of which is the nature of doctors and their needs and the difference between them and professionals who work on computers (Jensen, Jensen, & Brunak, 2012; Miotto et al., 2016).
- 3- Standards, which are among the most important challenges facing the process of developing medical information systems - as we mentioned earlier - as they help increase accuracy and integration between various institutions, reduce errors and costs, raise the value of scientific research, and increase the integration of development efforts and investments. (analysis results, x-rays, doctor's reports, prescriptions, and all parts of the electronic medical record) (Jensen, Jensen, & Brunak, 2012;

Miotto et al., 2016). Monitoring information is drawn from several sources, and approaches to monitoring may vary depending on the type of information required and the resources available. Surveillance information is used in several ways: to identify cases to investigate, estimate disease extent, detect outbreaks, evaluate response and prevention measures, monitor changes in infectious agents, facilitate research, and measure the effects of changes in healthcare practices (Robertson, & Nelson, 2010).

**Previous study:** Over the past decades, electron medical records have changed the nature of work and the current structures of most institutes. Healthcare has been among the sectors that faced dramatic alteration with the application of electron medical records, which is viewed as an enabler of this process. Saudi healthcare technologies have been playing an essential role in healthcare institutions; showing significant possibilities to improve organizational efficiency, patient safety, and patient content (Al-Kahtani, et al., 2022). The realization of these possibilities in the Kingdom of Saudi Arabia is especially essential to successful electron medical records adoption in the healthcare sector.

**Study Design:** Cross-sectional study design is a type of observational study design. In a cross-sectional study, the investigator measures the outcome and the exposures in the study participants at the same time. Prospective most generally means "of or in the future." Most commonly, it means "potential, likely, or expected." It's used to describe something that might happen—or that you expect to happen—in the future (Hartung & Touchette, 2009). This study is a prospective, cross-sectional, and descriptive study for examination of the relationship between electronic medical records and detection of infectious diseases. This design is chosen in alignment with the study objective to identify the impact of electronic medical records on the expected of pandemic.

#### Study Location

- Kingdom of Saudi Arabia
- Riyadh City
- King Saud University
- King Khalid University Hospital

## DATA COLLECTION METHODS

A questionnaire is a list of questions or items used to gather data from respondents about their attitudes, experiences, or opinions. Questionnaires can be used to collect quantitative and/or qualitative information. Questionnaires are commonly used in market research as well as in the social and health sciences (Marshall, 2005). The current study depended on the questionnaire sheet in data collection that filled by participants through internet questionnaire in healthcare institutions, Kingdom of Saudi Arabia. Data was management based on the demographic information of participants such as the location of healthcare institutes and the job description.

**Research tools:** The present study was used the questionnaire reports that fill up by participants among healthcare institutions, Kingdom of Saudi Arabia. The designed questionnaires that contained well-structured questions grouped into sections were distributed amongst participants. The questionnaires were comprising the following sections:

- I. Socio-demographic information.
- II. Perception of participants about role of electronic health records.

Before arriving at the final questionnaire, the first designed questionnaire was validated through a pilot-test by administering it to 10 target respondents. This was done to ensure the questions are understandable, the study is reliable and trustworthy and to estimate the time taken to complete the questionnaire by target respondents.

**Research population:** The sample population of this study include healthcare providers who working in various hospitals in at Kingdom of Saudi Arabia. The participants will be choosing as the following criteria:

**Inclusion Criteria:** According to the population that was filling up the questionnaire sheets the inclusion criteria are:

- All healthcare givers (female-male) as doctor, nurse, physician and and other.
- Working in any department of healthcare institutions.
- Working at hospitals in Riyadh, Saudi Arabia kingdom.

**Exclusion Criteria:** According to the healthcare givers that exclusion from this study, the exclusion criteria are:

- Any patients do not belong to governmental healthcare institutions, Saudi Arabia Kingdom.
- Recent healthcare worker within six months.
- Students and volunteer.

**Sample Unit:** The sample size was 150 (n=150) healthcare givers approximately, the sample will be classified based demographic information of participants according to following unlimited population equation at Confidence Level 95%, margin of error 5%, and population proportion is 50%:

$$Cl = P \pm z \times \sqrt{\frac{p(1-p)}{n}}$$

Were *z* being *z* score; *p* is the population proportion; and *n* are sample size.

**Data Analysis Methodology:** Data was analyzed by using statistical analysis of data was conducted used an appropriate tool as the following, Graph Pad software and SPSS (Statistical Package for the Social Science, Chicago, Illinois USA, version 25.0)

**Ethics and Human Subjects' Issues:** The study was obtained an approval from the Saudi Arabia health research ethics committee, which is part of the national institute for medical research and following the Helsinki instructions as the following points:

The researchers were committed to honesty that is recommended by scientific forums. The researchers were presented the research data, methods, procedures, and results in an honest manner. The researchers were careful to avoid any falsifications or data misrepresentation. Ethical approval was retrieved from all participants before the start of experiments where they were informed that all data used for research purposes only.

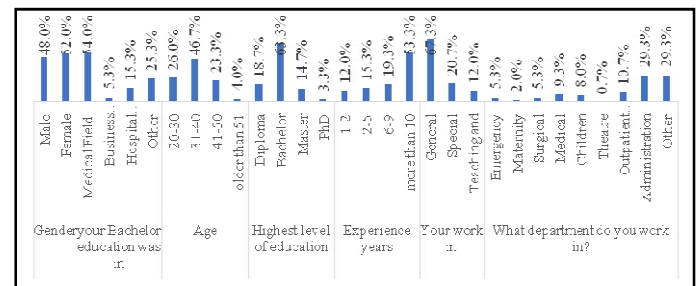
## RESULTS

**Section I: Socio-demographic characteristics of participants:** Table 1 presents a comprehensive overview of the socio-demographic characteristics of the study's participants. In terms of gender distribution, there is a fairly equal representation of males (48.0%) and females (52.0%). When considering the participants' educational backgrounds, a significant majority (54.0%) have pursued their Bachelor's degree in the Medical Field, highlighting the prevalence of medical professionals in the sample. The age distribution reveals that the largest proportion falls in the 31-40 age range (46.7%), with the remaining participants spread across other age categories. Furthermore, the education level varies, with the majority holding a Bachelor's degree (63.3%), while a smaller percentage possess Diplomas (18.7%), Masters (14.7%), or PhDs (3.3%). In terms of experience, it's noteworthy that more than half of the participants (53.3%) have accumulated over a decade of experience. Finally, participants are engaged in various roles within different departments,

with the majority working in general capacities (67.3%) and others specializing in specific areas (20.7%).

**Table 1. Socio-demographic characteristics of participants**

	N (%)
<b>Gender</b>	
Male	72 (48.0%)
Female	78 (52.0%)
<b>your Bachelor education was in</b>	
Medical Field.	81 (54.0%)
Business Administration	8 (5.3%)
Hospital Administration	23 (15.3%)
Other	38 (25.3%)
<b>Age</b>	
20-30	39 (26.0%)
31-40	70 (46.7%)
41-50	35 (23.3%)
Older than 51	6 (4.0%)
<b>Highest level of education</b>	
Diploma	28 (18.7%)
Bachelor	95 (63.3%)
Master	22 (14.7%)
PhD	5 (3.3%)
<b>Experience years</b>	
1-2	18 (12.0%)
2-5	23 (15.3%)
6-9	29 (19.3%)
More than 10	80 (53.3%)
<b>Your work in</b>	
General	101 (67.3%)
Special	31 (20.7%)
Teaching and Research Hospital	18 (12.0%)
<b>What department do you work in?</b>	
Emergency	8 (5.3%)
Maternity	3 (2.0%)
Surgical	8 (5.3%)
Medical	14 (9.3%)
Children	12 (8.0%)
Theatre	1 (0.7%)
Outpatient department	16 (10.7%)
Administration	44 (29.3%)
Other	44 (29.3%)



**Figure 1. Socio-demographic information of participants**

## Section II: Role of Electronic Medical Records in Predicting of Infection Disease

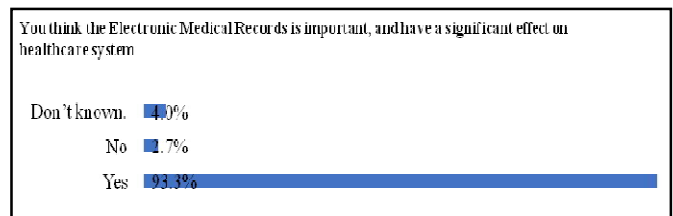
In Table 2, we observe various perceptions and opinions regarding the role of Electronic Medical Records (EMRs) in predicting infectious diseases within the healthcare system. The table provides insights into the attitudes of participants:

The overwhelming consensus among participants is that Electronic Medical Records are considered important and have a significant effect on the healthcare system, with 93.3% responding positively. Only a small minority (2.7%) expressed a negative opinion, and 4.0% were unsure. Participants were also asked about the extent to which EMRs support information about each patient. The majority of respondents (53.3%) believe that EMRs provide comprehensive support, with 71-100% coverage. A significant percentage also felt that 51-70% (21.3%) or 31-50% (16.0%) of patient information is supported by EMRs. Regarding the continuity of EMRs' oversight by managers, 57.3% of participants believe that they are continuously

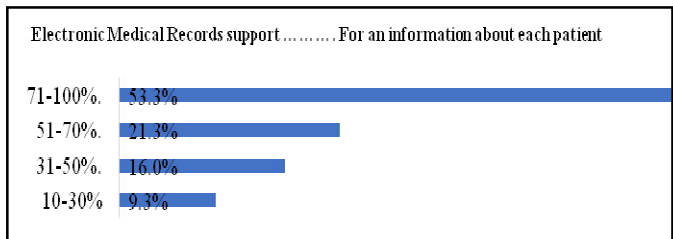
followed by managers, while 29.3% were uncertain, and 13.3% believe otherwise. Regarding the regular updating of EMRs, 77.3% of participants believe they are usually updated, while 13.3% do not, and 9.3% are uncertain. A substantial majority (81.3%) believe that patient safety is related to a good EMR system, while 6.0% do not, and 12.7% are uncertain. Concerning the sufficiency of data in EMR databases for predicting infectious diseases, 64.7% believe that there may be insufficient data, while 13.3% do not, and 22.0% are uncertain. In terms of the quality of EMRs in their respective hospitals, the majority find them to be good (31.3%) or very good (28.7%). A significant proportion also considers them excellent (22.7%), with a smaller percentage finding them not bad.(%17.3) Most participants (76.0%) believe that the quality of EMRs has a positive effect on predicting infectious diseases, while 7.3% do not think so, and 16.7% are uncertain. A large majority (80.7%) feels that Electronic Medical Records facilitate easy access to information about the incidence and prevalence rates of infectious diseases, whereas 10.7% disagree, and 8.7% are unsure. When it comes to the role of EMRs in predicting pandemic diseases, 78.0% believe they play a critical role, while 6.0% disagree, and 16.0% are uncertain.

**Table 2. Perception about Role of Electronic Medical Records in Predicting of Infection Disease**

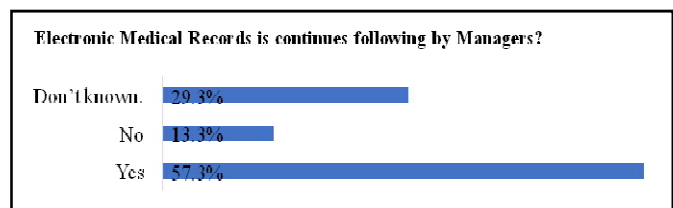
	N (%)
You think the Electronic Medical Records is important, and have a significant effect on healthcare system	
Yes	140 (93.3%)
No	4 (2.7%)
Don't known.	6 (4.0%)
Electronic Medical Records support ..... For an information about each patient	
10-30%	14 (9.3%)
31-50%.	24 (16.0%)
51-70%.	32 (21.3%)
71-100%.	80 (53.3%)
Electronic Medical Records is continues following by Managers?	
Yes	86 (57.3%)
No	20 (13.3%)
Don't known.	44 (29.3%)
The quality of Electronic Medical Records in your hospital is	
Not bad.	26 (17.3%)
Good	47 (31.3%)
Very good	43 (28.7%)
Excellent	34 (22.7%)
The quality of Electronic Medical Records has positive effect on the predicted about infection diseases	
Yes	114 (76.0%)
No	11 (7.3%)
Don't known.	25 (16.7%)
Easily arrive the information about incidence and prevalence rate of infection disease by Electronic Medical Records?	
Yes	121 (80.7%)
No	16 (10.7%)
Don't known.	13 (8.7%)
The Electronic Medical Records play a critical role in prediction of pandemic disease?	
Yes	117 (78.0%)
No	9 (6.0%)
Don't known.	24 (16.0%)
Electronic Medical Records are usually updating?	
Yes	116 (77.3%)
No	20 (13.3%)
Don't known.	14 (9.3%)
Patient safety is related to good Electronic Medical Records system ?	
Yes	122 (81.3%)
No	9 (6.0%)
Don't known.	19 (12.7%)
The Electronic Medical Records database may have insufficient data for predicting of infection disease?	
Yes	97 (64.7%)
No	20 (13.3%)
Don't known.	33 (22.0%)



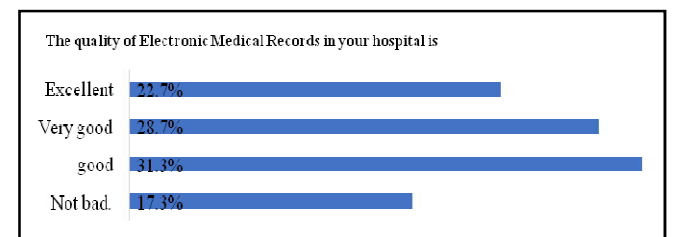
**Figure 1. Important of electronic medical records**



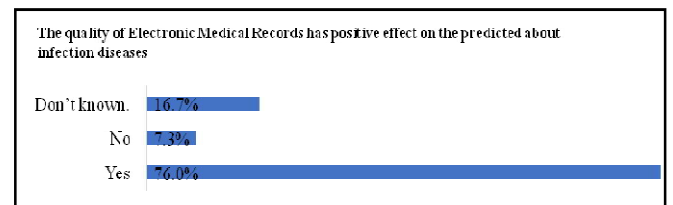
**Figure 3. Perception about medical records support**



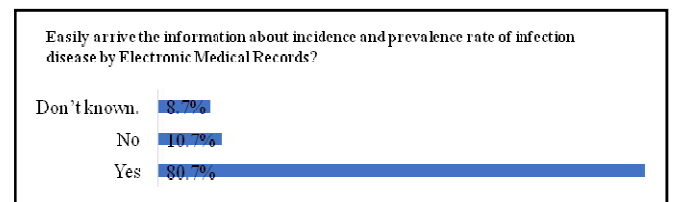
**Figure 2. Perception about medical records sustainable**



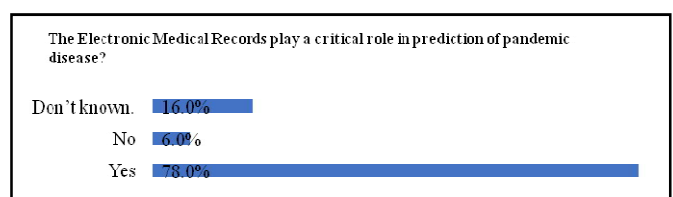
**Figure 3. Perception about medical records quality**



**Figure 4. Perception about medical records effectiveness**



**Figure 5. Perception about medical records accessible**



**Figure 8. Perception about medical records role in Pandemic diseases**

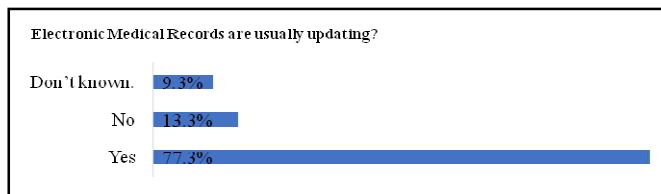


Figure 9. Perception about medical records updating

## DISCUSSION

### **Role of Electronic health records in prediction of infection diseases:**

The outcomes of the current study showed most participants in this study hold positive views on the importance and effectiveness of Electronic Medical Records in predicting infectious diseases. However, there are some uncertainties and differing opinions on specific aspects such as data sufficiency and managerial oversight. These insights are valuable for understanding the perspectives of healthcare professionals on EMRs in the context of infectious disease prediction. These results are compatible with our outcomes about the importance role of electronic health record in predicting of infection disease. Automated patient risk stratification techniques that leverage electronic health record data have the potential to provide critical support for clinical decision making. In contrast to risk estimates that rely on manual chart review, risk estimates derived from the electronic health record can be generated and updated automatically throughout a patient's hospitalization (Hebert et al., 2013). Li et al (2019) showed the Using of electronic health record data, provides accurately stratify CDI cases according to their risk of developing complications. One of the biggest advantages of using technology in healthcare is the ease with which data can be created, stored, and transferred between systems and peripherals. When it works well (and when parties comply with HIPAA compliance), this spread of data allows for better healthcare management: from diagnosis to treatment (Laudon, & Laudon, 2013). These studies were compatible with our survey outcomes by it is clear that the vast majority of healthcare workers believe that electronic health records are important and have a significant effect on prediction of infection disease.

**Mechanism of electronic health records:** Reliance on the electronic health record is increasing efficiency and productivity over paper records through quick access to patient information and thus obtain better care. The doctor finds all the patient's personal and medical information, including his medical and medical history, laboratory analyzes and their reports, x-ray examinations and their reports, and drug prescriptions. . Data is saved from the moment the patient arrives inside the central computer by seamlessly linking frequency band technology, and the central computer is also linked to other different data storages via the network. This process is an ideal flow of information in the clinic (Miotto et al., 2016). Through this system, it is possible to obtain the results of laboratory tests and the results of radiographic imaging in just seconds, so the doctor takes a comprehensive look at the patient's file with the click of a button, and he has sufficient information about the patient to give him the appropriate treatment method for his condition. According to daily practices in hospitals, electronic health records contain much fewer errors than paper records, and they also contribute to greatly improving communication between doctors, allowing each party to have full access to the patient's medical history instead of a quick glance at the current visit and thus the doctor evaluates More depth of the pathological condition with access to an accurate diagnosis more quickly (Rajkomar et al., 2018). An electronic health record makes it easier for clinicians to follow up on patients and track ongoing care, whether supervised by themselves or by the patient's other physicians; When a patient is under the care of multiple doctors, keeping track of his or her history, including allergies, blood type, current medications, past procedures, and other relevant information, can be problematic when relying on paper maps (Weiskopf, & Weng, 2013). The use of electronic health records allows multiple caregivers to simultaneously access a patient record from any computer, regardless of location. The

electronic record can provide up-to-date information on a patient's complete history, including current test results and recommendations of other physicians, allowing for greater collaboration in multiple aspects of a patient's care. Healthcare providers can quickly transfer patient data to other departments or providers, with fewer errors leading to better management of outcomes (Boonstra, & Broekhuis, 2010). Within healthcare organizations, information technology has provided the opportunity to transform almost all aspects of the healthcare sector into a digital format. From customer information to the use of devices that can predict the course of disease. From the outside, the IT department helped enable patients to communicate, book appointments and order medication online (Cresswell, & Sheikh, 2013).

**Challenges in Use Electronic Health Records:** The use of electronic detection of safety issues is now available through electronic health record vendors and analytics vendors, and even with on-premises systems across health systems. But the big challenge is that this approach has not been widely adopted. Barriers to its adoption include an established safety infrastructure that relies on incident reporting systems, concerns about the legal and reputational risks resulting from the detection of too many safety events, challenges in how to respond to this increasing level of safety issues with already overburdened clinical resources, and questions about Costs and return on investment of this approach (Classen, Griffin and Berwick, 2017). Sharing electronic health records between patients and providers helps improve diagnosis and enhances self-care and enables patients to learn more about their health. The use of electronic medical records is still weak so far, but this percentage is increasing in Canada, America, and Britain. Health care information in electronic medical records are important sources for research, clinics, and some policy actions. Health information privacy (HIP) and security has been a major concern for patients and providers, as studies in Europe see electronic health record as a threat to electronic medical records and the exchange of personal information. Moreover, the tracking features of the hospital software allow collecting detailed information about the formulations being dispensed, and creating a database for each treatment that can be used for research purposes (Karsh et al., 2010).

## CONCLUSION

Healthcare cloud computing supports many of these data capabilities and has created the category of cloud-connected medical devices and related software. The idea of devices with sensors that can communicate with other devices and systems is often referred to as the Internet of Things. Despite the many opportunities for medical devices in healthcare, all that data being generated and circulated online can be just as electronic health records can Real-time analysis and data mining of registries, along with other data, can be used in syndromic surveillance to quickly identify common exposures among patients suspected of being part of an outbreak, to predict epidemics, and for early detection of outbreaks. Especially in identified hotspots of epidemic pathogens and perhaps as a means of preventing epidemics.

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