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Evaluation of Electronic Health Records Adoption in Egypt

[1]Ahmed Sharaf Eldin, [2]Doaa Saad, [3]Ghada.A.Samie
[1]Medical and Bio-Informatics Department, Faculty of Computers and Information, Helwan University, Cairo, Egypt
[2, 3]Information Systems Department, Faculty of Computers and Information, Helwan University, Cairo, Egypt

ABSTRACT

Information technology offers a lot of systems to develop and facilitate work in different areas. Electronic Health Records system is relevant in providing support and development of work in the medical field, This paper presents the current state of Electronic Health Records in Egypt. It Surveys a sample of public, private, and educational hospitals in Egypt.

Keywords: **Electronic Health Records.**

I. INTRODUCTION

Electronic Health Records(EHR) is one of the information technology mechanism in healthcare environments that can improve patient safety and increase practice efficiency[1,4] and can provide positive returns on investment[5-7]. Due to these advantages, governments in many countries have tried to encourage the adoption of EHR in clinical practice, but the rate at which these technologies have been adopted remains low.

II. BEHIND ELECTRONIC HEALTH RECORDS

The Health Information Management Systems Society's (HIMSS) define EHR as :
The Electronic Health Record (EHR) is a longitudinal electronic record of patient health information generated by one or more encounters in any care delivery setting. Included in this information, are patient demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data and radiology reports. The EHR automates and streamlines the clinician's workflow. The EHR has the ability to generate a complete record of a clinical patient encounter - as well as supporting other care-related activities directly or indirectly via interface - including evidence-based decision support, quality management, and outcomes reporting.

III. SURVEY AREA

The Healthcare Sector in Egypt is divided into two main categories public and private, The public hospitals in Egypt are three different types, the first one is directly controlled by Ministry of Health, the second type involves the hospitals of universitieswhich is controlled by medicine colleges in each university, and the third type is the health insurance hospital which is controlled by the General Authority for Health Insurance under supervision of Ministry of Health.
The private sector supervised by Ministry of Health is divided into three types: hospitals, medical centers
The questionnaire designed to cover all the above areas of health.

IV. QUESTIONNAIRE DESIGN PROCESS

Questionnaire, is the data gathering technique used in surveying EHR adoption in area of hospitals. The Questionnaire method can be answered quickly, relatively inexpensive way to gather data from a large number and allow people to provide real facts. The questionnaire used here is designed through three Stages as follows:

Stage 1: Questionnaire Design

This stage determines what facts needs to be surveyed about EHR and who employees will be involved in the survey inside hospitals. A Fixed-format questionnaire is used where Closed-ended questions are presented to make it easier to answer .

Stage 2: Pre-Testing

Pre-testing is one of the most important stages in designing a Questionnaire. The purpose of this stage is testing and ensuring the efficiency of the questionnaire to collect data and how it is easy to understand.
Pre-testing can be done in several ways:
- Testing the initial design decisions and items to determine how well the process is working.
- Reviewing past studies with the same or similar research problems; this enable to develop initial drafts of questionnaires by borrowing and modifying validated questions from previous studies.
- Conducting pre-test interviews with several healthcare professionals, expert researchers and colleagues until feeling comfortable with the questionnaires.
- Conducting pre-test questionnaires on sample of people in order to ensure that the respondents understand the questions.

Stage 3: Final Questionnaire Refining

The results from pre-testing stage are used to:- Improve the Questionnaire design and implementation of plans of analyzing data.

- Estimate how long it takes to complete a Questionnaire.
- Discover factors that affect response rates & data quality, and make adjustments accordingly.

The final changes of the questionnaires and plans for analyzing the data should be made in this stage

V. THE FINAL INSTRUMENT

The questionnaire was distributed to all the chosen hospitals and the responses were received from (60%) of the surveyed hospitals. The percentage of hospitals that adopted EHR was 6.67 % .The most common reason given for not introducing EHR was: "The cost is high" ,which was observed in 38.1% of the hospitals that didn't introduce the system and have plans to introduce it in the future .

All the above stages are distributed to get three different questionnaires:

- Questionnaire dedicated to doctors " 9 pages, 24 questions"
- Nurses " 5 pages,12 questions"
- Administrators " 5 pages,12 questions"

Every questionnaire is divided into three sections:

- Demographic data section
- Hospitals didn't adopt EHR section
- Hospitals that adopt EHR section

VI. RESULTS

After designing questionnaires and distributing it, comes the analyzing of the collected data. The questionnaires were distributed on 50 hospitals but the responses obtained from only 60 percent of them because the percentage of the hospitals that adopt the system is only 6.67%.

The questionnaires targeted three sectors of the hospital staff, doctors, nurses and administrators, as explained in the previous section.

Barriers prevented the system adoption, effectiveness of EHR, cost-effectiveness of EHR, real use of system functions

VII. BARRIERS

Many reasons exist when it comes to the barriers that prevented the system adoption , such as lack of computer skills or Access technical support but the most common reason is " The cost is high" that's clear in 81.0% of the hospitals that didn't adopt the system yet. By analyzing the collected data,

some barriers that prevented the adoption of the system are shown in table 1 and are graphically represented in Figure1.

Barriers	Major barrier	Minor barrier
Access to technical support	44%	36
Computer skills	17%	48
Lack of uniform industry standards	44%	49
Technical limitations of systems	21.4%	58
Privacy or security concerns	3.57%	17
Start-up financial costs	81%	17
Ongoing financial costs	63%	35
Training and productivity loss	15.5%	65

Table1: EHR Barriers

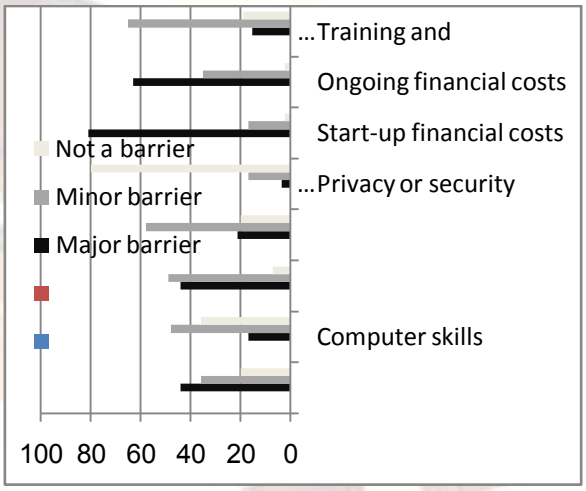

Figure1: Graphical representation of Barriers in EHR adoption

VIII. EVALUATION OF THE EFFECTIVENESS OF ELECTRONIC HEALTH RECORDS

In hospitals that adopted HER, we can measure its effectiveness. In terms of the effectiveness of EHR in hospitals, the most common response is "EHR is adopted to increase Quality of services" which is (100%). This is followed by " EHR accelerates and improves Performance " which is (67%). Most notable was the response "time efficiency of physicians " which is 50% . This is shown in table2 and Figure2.

Functionality	Usage
Demographic functionality	100%
Clinical documentation functionalities	66%
Order management functionalities	66.7%
Reporting functionalities	50%
Results management functionalities	37.5%

Table2: Effectiveness of HER

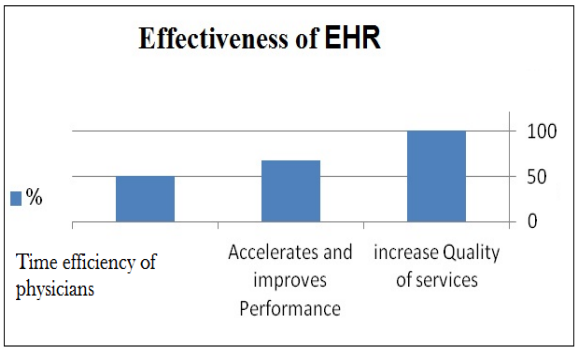

Figure 2: Effectiveness of EHR

IX. EVALUATION OF THE COST-EFFECTIVENESS OF ELECTRONIC MEDICAL RECORDS

With regard to the cost-effectiveness of EHR, 33% of the sample gave responses of either "strongly agree" or "somewhat agree." With regard to the necessity of promoting computerization of healthcare information in Egypt in the future, the combined responses of "strongly agree" and "somewhat agree" amounted to 50%.

X. EVALUATING REAL USE OF SYSTEM FUNCTIONS

EHR has five types of functionalities:

1. Demographic functionality
2. Clinical documentation functionalities
3. Order management functionalities
4. Reporting functionalities
5. Results management functionalities

Table 3 shows the functionalities

Table3: EHR functionalities.

XI. EHR Adoption

As shown from the results presented, the proportion of hospitals that have implemented the system was too small about 7% approximately, which means that the development of the system in Egypt is less than 10%, which requires to be applied more in all hospitals.

The following steps are needed to adopt the system[9]:

Step 1: Assess Practice Readiness

This Step determines if the readiness exist to make the change from paper records to electronic health records or not.

First Determine the current state in hospitals

The current state of hospitals can be determined by assessing the administrative processes, the linical workflows, data collection and reporting processes, Internet connectivity, staff member's computer skills and the budget required.

Second Envision the Future

The application in future can be examined by notifying the difference between the current state of the staff and the patients, and the practice leadership plans for them in the future.

*A. Third **Set Goals***

Decision making need's to document Goals and needs, throughout the EHR implementation process , goals must be important and meaningful to the practice , These goals may be clinical goals, revenue goals, or goals around work environment, the goals must be specific, measurable , Attainable , Relevant and Time bound.

Step 2: Plan The Approach

Good EHR implementation plan will guide to perform the efficient tasks

In the right order, there are some tactical steps during the EHR implementation planning phase like:

- Workflow and work processes Analysis and mapping.
- Create new workflow patterns to improve inefficiency.
- Create back-up plan to combat issues that may arise throughout the implementation process.
- Create a project plan for transitioning from paper to EHR.
- Transform information from paper charts to electronic charts.
- Understand what data elements may be migrated from the paper system to EHR.
- Create a plan to address the concerns and obstacles regarding privacy and security.

Step 3: Select or Upgrade to a Certified EHR

One of the critical decisions in the EHR implementation process is system Vendor selection, it can be selected through the planning process and accordingly develop the selection criteria or select EHR software and then begin the planning to support the selected EHR system.

Step 4: Conduct Training & Implement an EHR System

There are some activities come after the installation of the EHR system such as training, mock "go-live," and pilot testing, these activities are mostly done in this phase .

Step 5: Continue Quality Improvement

This final phase refers to reassessing what have learned from training and everyday use of the system. It emphasizes continuous evaluation of practice's goals and needs to post EHR implementation to continue improving workflows that achieve the individual practice's goals and needs while leveraging the functionality of EHR.

XII. CONCLUSION

Still a long way to go to get Egypt's electronic health records system adopted in all hospitals, Coherent and conforms to international standards.

Our study clearly demonstrated that the current status of EHR adoption in Egypt has Fallen away from the desired, just few hospital apply the system And a lot of workers in the medical sector are unaware of what system and what are its benefits.

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