Dissertation VS

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PREFACE:

ABSTRACT-

Electronic Health Records software is being used today by most of the hospitals around the world to convey more secure, better consideration to patients as it is makes patient-physician communication better. EHR is a unified health record contains all the information about patient profile, demographic details, medical history, drug history, past medical encounters etc. It involves systematic collection of the patient's health information electronically by one or more encounters in any care delivery setting. This software has multiple benefits as it minimizes the paper work, save time and eliminated the maintenance of paper records. Introducing technological changes against the ongoing processes in any healthcare setting is not easy. The success of EHR software is directly proportional to the level of acceptance by the clinicians about the performance and clinical benefits of the software. I propose to study the impact of using the electronic health record software in an In- patient department and the success of the software in improving the efficiency of the physicians and reduce patient turnaround time. The goal of this study is to find out how satisfied physicians are with the electronic health record software in the In-patient department and to determine which features contribute the most toward the usability of electronic health record. This is a cross-sectional analytical study. The study was conducted in an In-patient department, among 43 physicians who all are the current users of EHR software. The data collected with the help of a questionnaire and then we will ask the physicians to answer a self-administered survey. The questionnaire was converted to an online google survey form and then share only among the participants who are a part of the study. The observations then analyzed by calculating the frequency of all the responses. Then the overall frequency of all the positive responses and negative responses was calculated individually and then we measured the standard deviation between the most common responses to the overall mean. After the completion of this survey, we will be able to analyze the perception of the physicians using EHR Software in IPD. We would be able to find out the variability in the responses and how much they differ from the resulted values.

INTRODUCTION:

An Electronic Health Record (EHR) is a collection of various medical records that get generated during any clinical encounter or events Purpose of collecting medical records, as much as possible, are manifold:

• Better and evidence based care

• Increasingly accurate and faster diagnosis

• Avoid repeating unnecessary tests

• Predictive analytics to support personalized care

• Improved health policy decisions

• Better understanding of the underlying issues

• All translating into improved personal and public health

Ministry of Health & Family Welfare notified the Electronic Health Record (EHR) Standards for India in Sept 2013. The notified standards were not only supported by professional bodies, regulatory bodies, stakeholders, but various technical and social commentators also Revised EHR Standards for India were notified in Dec 2016. For a health record of an individual to be clinically meaningful it needs to be from conception or birth, at the very least record of every clinical encounter (health-related event) can collectively provide a summary of the various healthcare events in the life of a person.

Without standards, a lifelong interoperable medical record is hardly interoperable. Guidelines are an assortment of your strategies and methods by work process. While building up the principles, consider what is needed in the EHR at the front work area:

1. **IDENTIFICATION AND DEMOGRAPHIC INFORMATION OF PATIENT**
   Demographic information including a unique identifier is necessary in a health record system in order to capture identifying information as well as identifiers for linking other medical artifacts logically as well as physically.

2. **ARCHITECTURE REQUIREMENTS AND FUNCTIONAL SPECIFICATIONS**
   A health record system must meet architectural requirements and functional specifications to remain faithful to the needs of service delivery, be clinically valid and reliable, meet legal and ethical requirements, and support good medical practices.

3. **LOGICAL INFORMATION REFERENCE MODEL AND STRUCTURAL COMPOSITION**
   A health record system must accumulate observable data and information for all clinically relevant events and encounters. For this purpose, it is important to have common semantic and syntactic logical information model and structural composition for captured artefacts. Unless the data being captured is standardized, its communication and understanding may not be same across systems.
4. **MEDICAL TERMINOLOGY AND CODING STANDARDS**

In order to have semantic interoperability between different health record systems, it is necessary to follow a common terminology and coding system standards to express unambiguous meaning of data captured, stored, transmitted, and analyzed. It is also important to have these terminologies and codes in computer process-able format to aid automation and ensure that data is in an analyzable state at all times.

5. **DATA STANDARDS FOR IMAGE, MULTIMEDIA, WAVEFORM, DOCUMENT**

   A health record system stores data records and files of various types in support of clinical functions. These data elements serve the purpose of documentary records of various diagnostic and prescriptive data or information generated.

6. **DATA EXCHANGE STANDARDS**

   A health record system has to operate in a larger ecosystem of other components with which it must share or communicate data in order to capture and provide as comprehensible medical information as is practical.

7. **OTHER STANDARDS RELEVANT TO HEALTHCARE SYSTEMS**

   Healthcare record systems need to co-exist within a larger ecosystem with various other systems. It is important for all systems within a healthcare setup to adhere to relevant standards.

8. **DISCHARGE/TREATMENT SUMMARY FORMAT**

   Implementers must ensure that the logical information model includes data elements to satisfy requirements of the format for Medical Records as specified by Appendix-3 of Medical Council of India (MCI) Code of Ethics Regulation 2002 (amended up to Feb-2016). The printed reports should meet MCI prescribed formats whenever any discharge or treatment summary is prepared.

The conspicuous justification use guidelines is to normalize the manner in which data is entered in the EHR, which is an extraordinary explanation offered that continuous help for the EHR turns out to be amazingly simpler when there is a standard way the framework is used. Different reasons incorporate every one of those recorded above in the response to why they are significant. Another explanation that might be more evident to others is profit from speculation (ROI).

With any change and the fitting utilization of progress the board, helping the people in the association comprehend the reasons that should mean something to them will have the most effect. Officially carrying out the new norms at a high-profile level will give the sponsorship important to its prosperity.

An electronic health record (EHR) is a repository of electronically maintained information about an individual's lifetime health status and health care, stored such that it can serve the multiple legitimate users of the record. Traditionally, the patient record was a record of care provided when a patient is ill.

A computer-based patient-record (EHR) system adds information management tools to provide clinical reminders and alerts, linkages with knowledge sources for health care decision support, and analysis of aggregate data both for care management and for research. To use a paper-based patient record, the reader must manipulate data either mentally or on paper to glean important clinical information. In contrast, an EHR system provides computer-based tools to help the reader organize, interpret, and react to data. The electronic medical record (EMR) is a legal document created by healthcare professionals. It's just an electronic version of the same paper form that doctors have been using for decades. EMR allows doctors to get rid of a lot of paper files they have on their patients. It also allows them to have quick access to structured data. The material can be shared and viewed in this format. The biggest drawback of this technology is that it cannot be easily distributed to other doctors or caregivers from its original site. In this regard, they're analogous to paper records in that they have to be printed multiple times. Transmitted to different places for processing on a physical level. The concept of a longitudinal and cross-institutional record of a patient's health and healthcare can be defined in a few words as HER. Carter states, "EHR systems designed for physicians' offices represent the simplest architecture consisting of three basic components: the database management system, user interface, and external interfaces.

An EHR system is used to not only gather patient-related data, but also to process, analyze and disseminate that information or data in order to carry out various operations linked to providing healthcare to patients. The execution of electronic clinical records (EMR) diminishes patient sufferance, which regularly happen on account of clinical mistakes. Speedy assortment of information and arrangement of precise data to the medical care suppliers are two of the hugest perspectives identified with the EMR frameworks. As we realize that specialists frequently write in messy style, which prompts incorrect information section into documents by a second or outsider. "With EMR this issue will for the most part become a relic of times gone by". Information security is another critical part of EHR in light of the fact that the mechanized information keeps unapproved individuals from getting to the information. A proficient EHR framework improves information security as well as gives advantages to the wellbeing purchasers.

Besides, the information isn't lost in the event of any peril since it very well may be saved at additional than one spot. EHR additionally helps wellbeing experts in the investigation of data by

Furnishing them with exact and state-of-the-art data about the patients. Complete clinical chronicles of the patients can be put away in their separate envelopes, which can help wellbeing experts recover that information effectively and immediately when required. Fast recovery of exact data likewise assists specialists with giving moment clinical consideration to the patients, which is an extensive advantage for the wellbeing customers. Next significant component of an EHR framework is its consistency and dependability. As it were approved workers are permitted to gather the information. The EHR framework measures the information in a steady way. It is

since, supposing that the information will be handled reliably, the clients of the EHR framework won't have any trouble in utilizing the data generated by the framework. The administration of any medical services organization needs to apply such components that ought to have the option to carry fundamental changes to the framework when required. Information consistency goes about as the establishment for an effective EHR framework. On the off chance that the information won't be handled and accumulated in a steady way, it will be very difficult for the clients of the EHR framework to maintain the business tasks of any organization productively. This data will likewise help with smoothing out normalized plan and execution choices between both crisis divisions. The data will be imparted to both crisis divisions to advance this normalization and give foundation into what benefits the EMR being supplanted has had on users. The second significant part of the assessment cycle is to decide the effect that the current EHR software has had on the physicians working inside Inpatient Department.

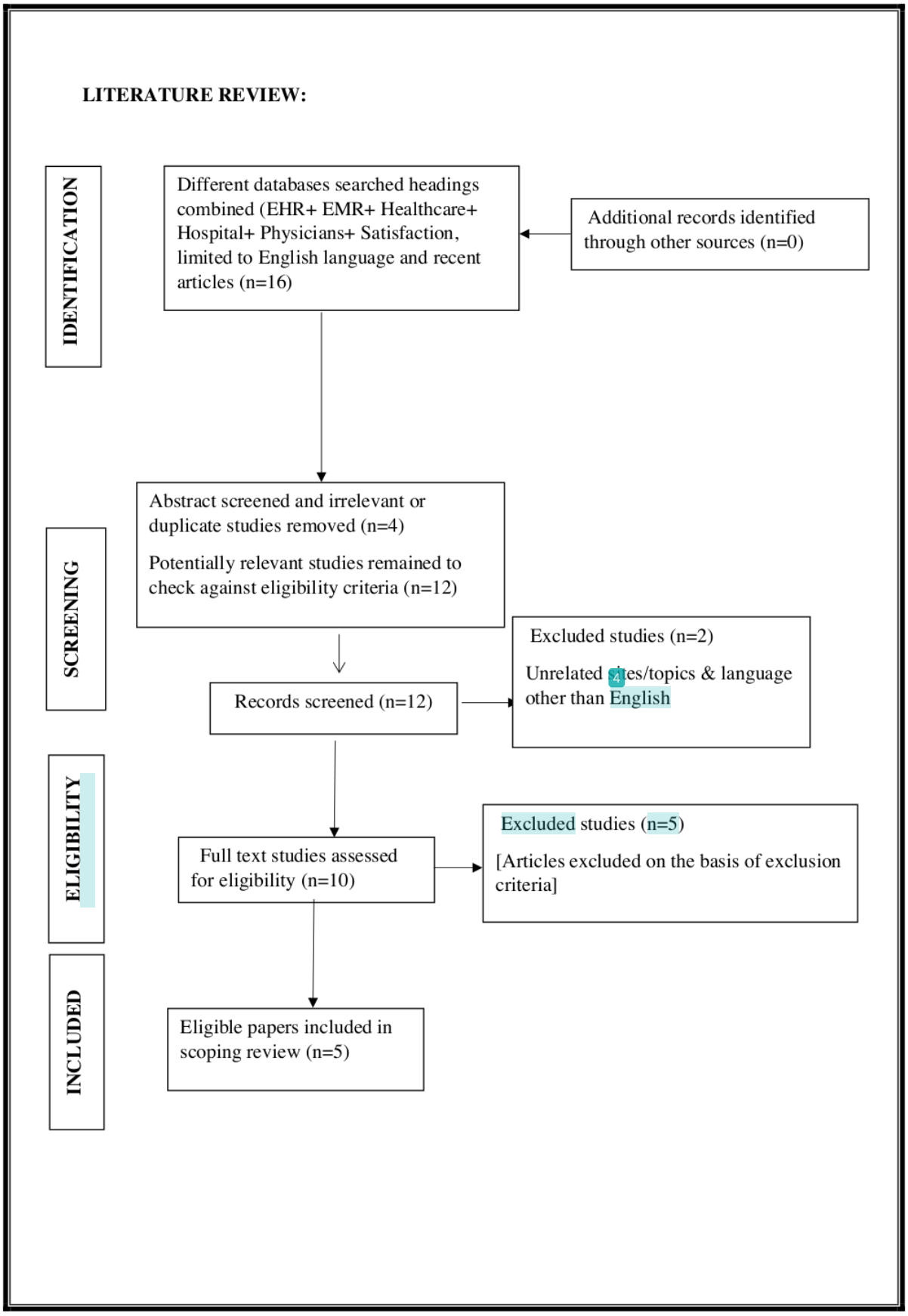
RESEARCH QUESTION:

- What is the degree of user satisfaction with the electronic health record used in In-patient department?

OBJECTIVE:

The goal of this study is to find out how satisfied physicians are with the electronic health record software in the In-patient department and to determine which features contribute the most toward the usability of electronic health record.

LITERATURE REVIEW:



METHODOLOGY:

It is a cross-sectional analytical study which was conducted among the users of EHR Software in the IPD department across max healthcare during the period of 3 months, from March 2021 to May 2021.For obtaining generalized information, a sample of 43 end users were selected as study population. The end users of EHR software broadly include physicians working in the IPD department. The system integrates updated patient information from EMRs and contains clinical decision support algorithms, allowing physicians to use it as central source for ordering and reviewing laboratory results. The physicians eligible for inclusion in the study were specialists and general practitioners working in an inpatient department during introduction of the system and who used the system routinely.

A list of all possible end users of the software working in IPD was obtained from organizational database. A simple random sampling using the chit drawing method was done to select the final sample size (N=43).

A pre-defined, structured and objective questionnaire consisting of 15 multiple choice questions was used as the study tool. The questionnaire then converted to an online google survey form and then shared only among the participants who are a part of the study. The factors taken into consideration to analyze the end user's satisfaction level with the EHR software:

1. Acceptance of the software
2. Easiness
3. Training provided
4. Device usability
5. Improvement in the workflow
6. Comparison with the paper records
7. Turn-around time
8. User-Friendliness
9. Communication among the users
10. Occurrence of medical errors
11. Placing orders
12. Clinical decision support system
13. Time consumption
14. Measurement and charting
15. Outcome Analysis

The questionnaire was sent by e-mail to all 43 study participants. Total three weeks of time was given to the participants to fill the questionnaire. For whatever reason, if despite the instruction and duration mentioned, the participant is unable to fill the questionnaire, it will be taken into account as non-response. And following this set protocol, the non-response rate was found to be nil. The primary data was collected to have an in-depth understanding of the current scenario.

PRIMARY DATA:

A pre-defined, structured questionnaire consisting of 15 objective type questions with multiple choice, based on the objectives of the study and focusing on the various aspect of

study was used. The observations were analyzed by calculating the frequency of all the responses. Then the overall frequency of positive responses and negative responses was calculated and then we measured the number of responses contributing most towards the satisfaction rate.

SECONDARY DATA:

A systematic literature search was performed on following databases:

- Medline
- Science Direct
- NCBI
- PubMed Central
- Scopus

This search included five articles which were written in English language and published within last 10 years (2010-2020).

Inclusion criteria:

To provide a structured review eligible study included on the basis of following parameters:

- Articles published within last ten years(2010-2020)
- Articles published in English language
- Cross-sectional analytical studies
- Purpose of the study is to determine the satisfaction of clinicians with the electronic health record software.
- Have measure or compared the satisfaction level of the end-users with the software and its various aspects.

Exclusion criteria:

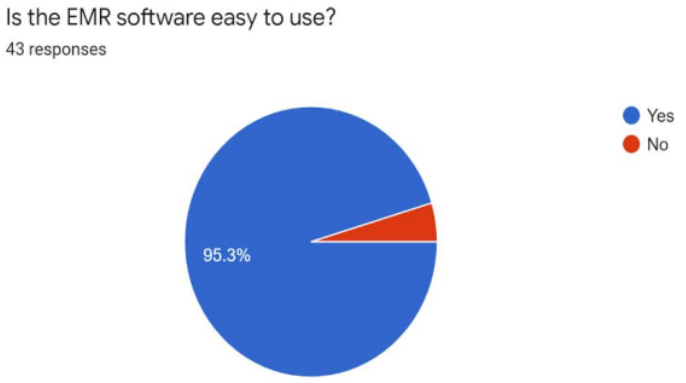
Studies excluded from this literature review on the basis of following parameters:

- Articles published before 2010
- Studies related to implementation challenges and administrative barrier.
- Studies which did not clearly describe their results
- Editorial articles and review articles

RESULT:

The responses collected from all the study participants were compiled and studied. The following results were obtained using the pre-defined questionnaire:

1.

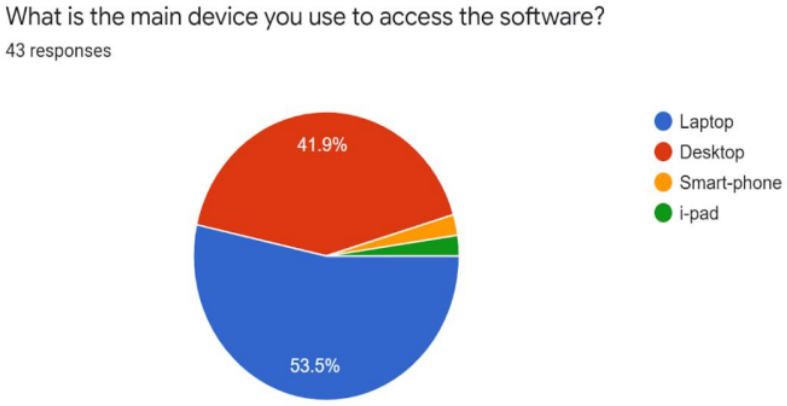


2.

No = 5

Yes = 38

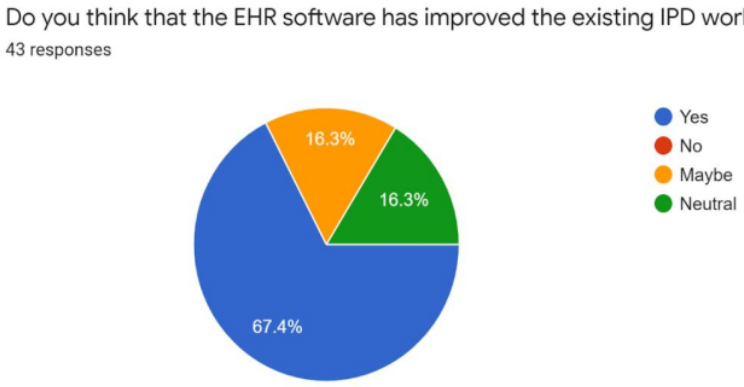
3.



Laptop= 23

Desktop= 18

4.



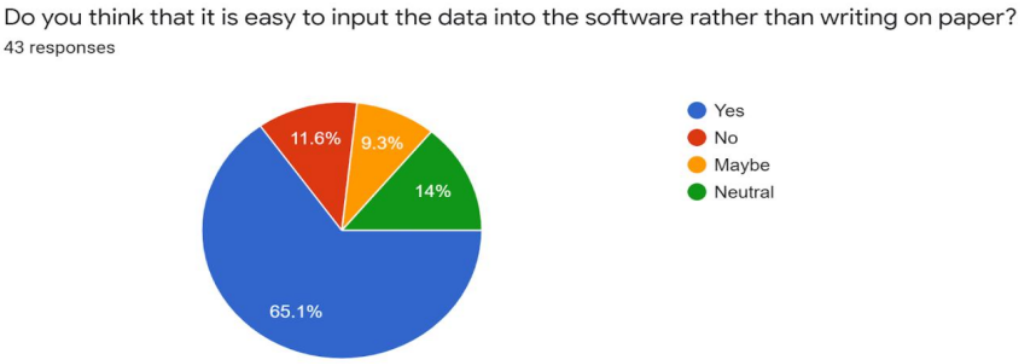
No= 0

Yes= 29

Maybe= 7

Neutral=7

5.



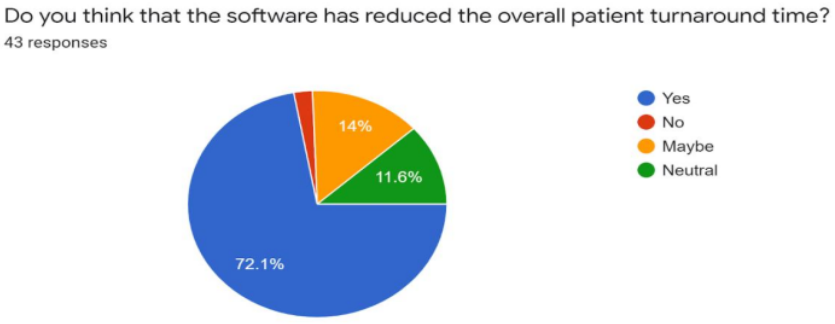
Yes= 28

No= 5

Maybe= 4

Neutral = 6

6.



Yes= 31

No= 1

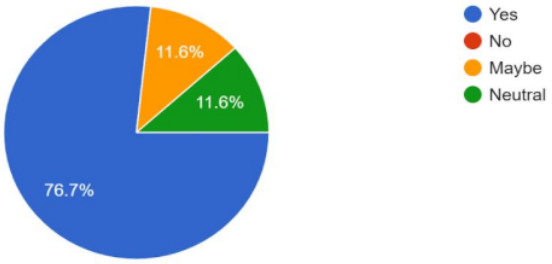
Maybe= 6

Neutral= 5

7.

Do you think that the software is user friendly?

43 responses



Yes = 33

No = 0

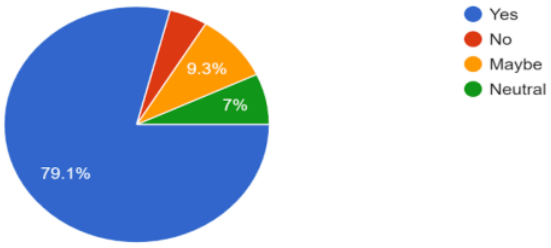
Maybe = 5

Neutral = 5

8.

Do you think that the EHR software has reduced the miscommunication between the users(clinicians)?

43 responses



Yes= 34

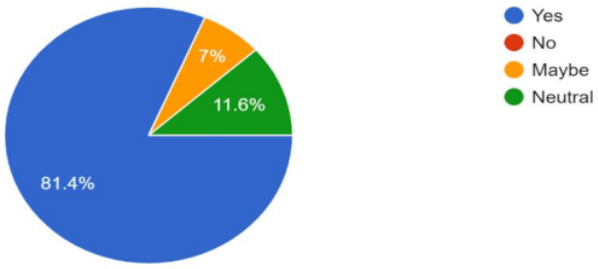
No= 2

Maybe= 4

Neutral = 3

9.

Do you think that it can help to minimize the occurrence of medical errors?
43 responses



Yes = 35

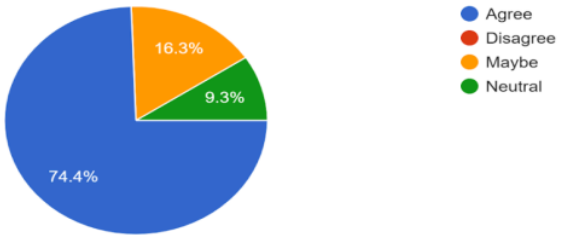
No= 0

Maybe =3

Neutral = 5.

10.

Do you agree that the ordering of medication, investigation, visits, cross referrals has been made easier by the software?
43 responses



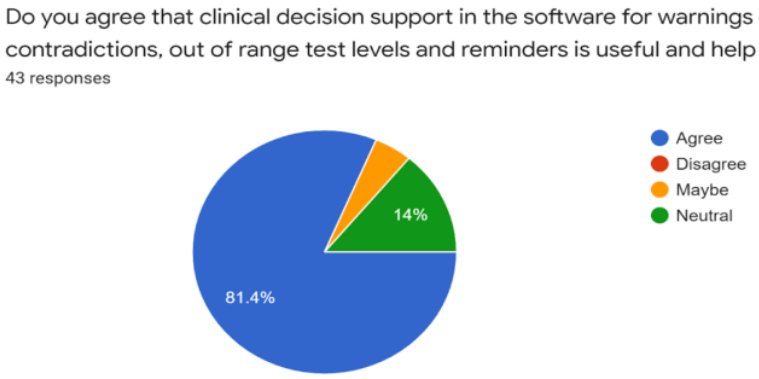
Agree = 32

Disagree =0

Maybe = 7

Neutral =4

11.



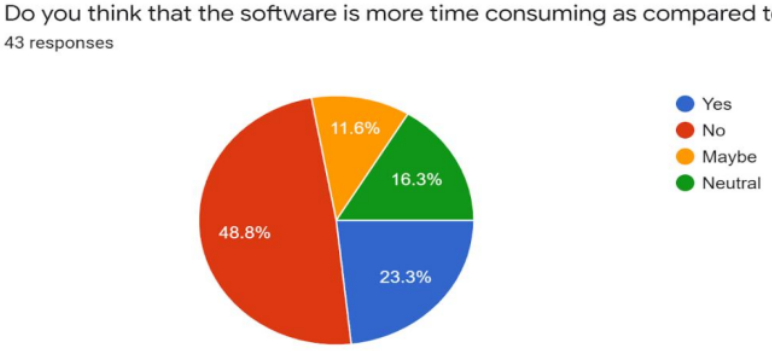
Agree = 35

Disagree= 0

Maybe= 2

Neutral = 6

12.



Yes =10

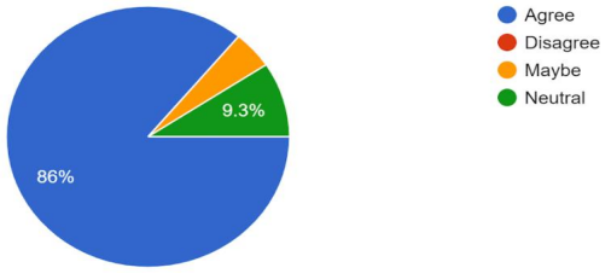
No= 21

Maybe = 5

Neutral = 7

13.

Do you agree that the EHR software has made the measurement and charting of vitals easier?
43 responses



Agree = 37

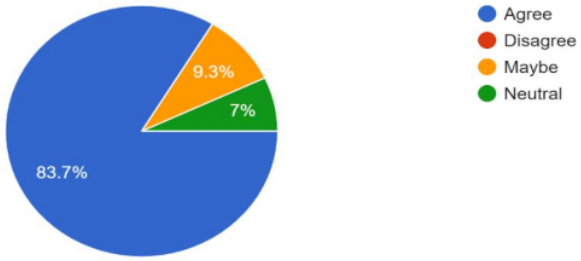
Disagree =0

Maybe = 2

Neutral =4

14.

Do you agree that the software has made the analysis of outcomes easier?
43 responses



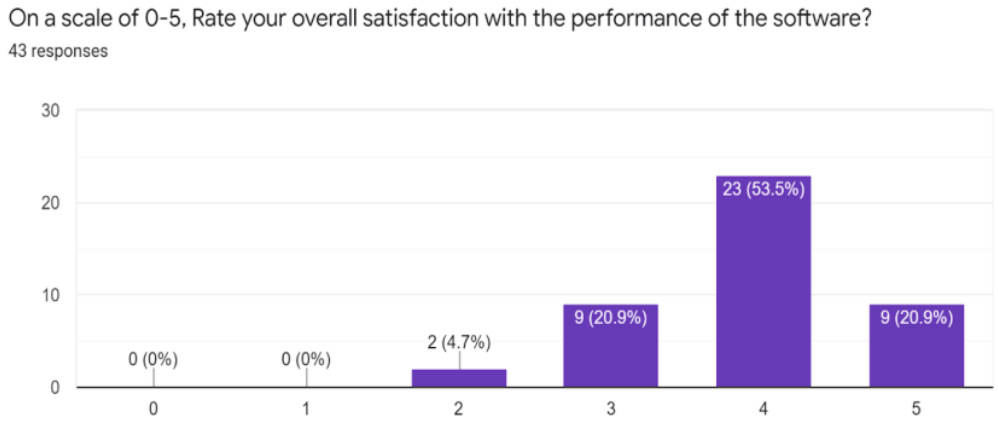
Agree = 36

Disagree= 0

Maybe= 4

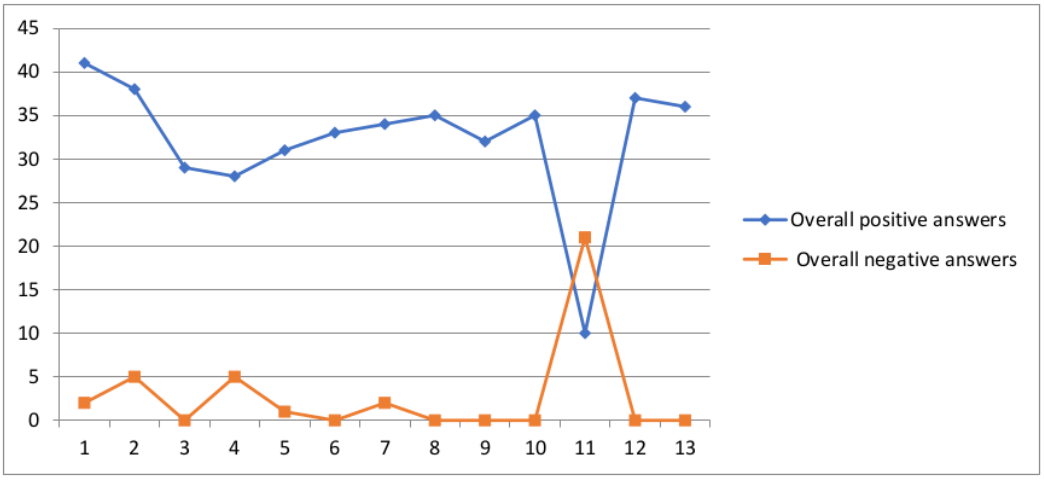
Neutral= 3

15.



Result above shows doctor fulfillment with the framework. The bar graph shown above reflects overall satisfaction of the physicians (0 is for least satisfied and 5 for highly satisfied). Just 4.7% were least satisfied with the performance; moreover, 20.9% were highly satisfied with the software. 53.5% of the overall participants were highly actually satisfied with the software.

The collected data was further analyzed to check the dispersion of the responses in the survey form. The graph below represents the variation of all the positive responses and negative responses calculated.



One of the most crucial findings of the study was high overall satisfaction with the system by the majority of the physicians. Physicians liked different elements of the software. Despite their partially negative attitude to the system, the physicians acknowledged that the technology would probably improve the quality of care.

Others have found, that the screen layout is confusing and difficult to follow, hindering use of EHRs by physicians. A user-friendly screen layout for information not only improves the efficiency and productivity of users but also increases the level of physician satisfaction and their desire to continue to use the system.

EHR systems create new workflows, which may result in human error over time if not properly integrated. Many complex technological and social issues must be addressed in introducing such systems, and a middle ground must be reached between clinical workflow and software features while not compromising patient's safety or the quality of care.

The main dimensions of this study contributing towards the satisfaction level were related to its functionality, we found that the strongest predictor of overall satisfaction was the quality of information, which is helpful in analysis & CDSS to avoid medical errors.

Patient information is critical for delivering the best care; however, in this study, the physicians were not satisfied with the completeness of the software, as they 've found it a bit challenging as compared to the paper records.

DISCUSSION:

Fulfillment with the framework in this investigation was not associated with the segment qualities of the members, counting age, sex, ethnicity, calling or division, which is reliable with a few other studies. One of the most crucial findings of our study was high overall satisfaction with the system by the majority of the physicians. Despite their overall attitude to the system, the physicians acknowledged that the technology would probably improve the quality of care. But it is directly proportional to the amount and quality of training provided by the hospital administration to the doctors to understand the workflow of the software.

This is surprising, as we would have expected higher percentages of the clinicians to report more positive views on one of the main advances introduced by EHRs. Lack of accuracy and completeness of information, as indicated in this study, should alert the hospital management to provide continuous support training to the physicians working in IPD. Delayed support from the information technology department when needed can increase physicians' frustration with the system.

53.5% were happy with the framework; moreover, 4.7% was able to thoroughly forsake the framework and go back to paper records. Of the doctors reviewed, 65% of the users found it difficult to enter the data into the software, and 20.9% of the individuals who did not have any desire to return to a paper framework needed to change this specific framework. Despite their overall positive attitude to the system, the physicians acknowledged that where the technology would probably improve the quality and functionality. 81% of the doctors believed that the software has improved the medical errors. Just 48.8% of the doctors thought about that the software wasn't incorporated well with their work process in terms of time consumption, a significant factor in generally fulfillment with the framework.

Clinical decision support system, considered as a highly contributing feature as 81.3% of the physicians appreciated the same. Cheng et al.8 remarked that EMR frameworks make new work processes, which may bring about human blunder after some time if not as expected coordinated. The main primary components of this study were related to overall satisfaction, as discovered that the quality of information was the strongest predictor of overall satisfaction. Systems performance quality is highly appreciated feature by the physicians. It includes various elements such as ordering of medications, lab tests, visit orders etc. It has become so easy to analyze the charts and graphs of the patient. Because satisfaction improves for some parts of a system but not for others, the best method for enhancing satisfaction is to focus on those features.

The highly contributing factors towards the increase usability are Availability of clinical decision support system which is helping in reducing the medical errors. Second and highly appreciated feature is measurement and charting of vitals which saves a lot of time. And the last one is analysis of the outcome, be it the graphs or the critical report. It helps to reduce the turn-around time. According to the survey, physicians are generally satisfied with the EHR system, but the different components of it need to be improved to attain the high satisfaction level among the users.

CONCLUSION:

Numerous complex innovative and social issues should be tended to in presenting such systems, and a center ground should be reached between clinical work process what's more, programming highlights while not trading off patients' wellbeing or the nature of care. Deferred support from the data innovation division when required can build doctors' disappointment with the framework. Studies have shown that great help by data innovation divisions and better cooperation with doctors improves the achievement pace of as of now introduced systems. In order to implement such systems, many complicated technological and societal challenges must be addressed, and a balance must be struck between clinical workflow and software features without jeopardizing patient safety or treatment quality. As shown in this study, a lack of accuracy and completeness of information should warn hospital management to enhance reporting from departments that give patient information, such as the laboratory and radiology departments. This includes performing the needed tests quickly and accurately, as well as entering correct and timely data into the system. A user-friendly information screen structure not only enhances user efficiency and productivity, but it also promotes physician satisfaction and willingness to continue using the system. To improve the satisfaction and to increase the acceptance, the various affecting factors are required be taken into consideration individually. This study shows that physicians were not completely satisfied with the EHR system and that various aspects of the system require improvement. In order to implement such systems, many complicated technological and societal challenges must be addressed, and a balance must be struck between clinical workflow and software features without jeopardizing patient safety or treatment quality. To improve the satisfaction and to increase the acceptance, the various affecting factors are required be taken into consideration individually. Continued evaluation of installed systems and feedback from users should guide future selection and introduction of EHR system.

REFRENCES:

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ORIGINALITY REPORT

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PRIMARY SOURCES

1	Hana Alharthi, Adel Youssef, Salma Radwan, Sukainah Al-Muallim, Al-Tuwaileb Zainab. "Physician satisfaction with electronic medical records in a major Saudi Government hospital", Journal of Taibah University Medical Sciences, 2014 Publication	1%
2	applications.emro.who.int Internet Source	1%
3	P Lindgren. "Cost of Parkinson's disease in Europe", European Journal of Neurology, 6/2005 Publication	<1%
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