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Barriers to Electronic Health Record System Implementation and Information Systems Resources: A Structured Review

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Abstract

Electronic health record systems have the potential to improve the quality of health services primarily through the availability of health information. Implementing EHR systems in healthcare facilities has been met with an alarming rate of failure. This paper reviews the literature identifying barriers to implement an EHR system. Identifying the barriers will be a precursor to assessing readiness for such a system. A structured literature review was done in accord with the PRISMA guidelines. The barriers identified were categorized into the information systems resources. The review suggests that people resource (user resistance and lack of skills) and procedure resource (concern for return on investment and lack of administrative and policy support) are the primary barriers to overcome. Further studies are directed to examine the barriers in detail and recognize how to address said barriers.

1. Introduction

An electronic health record, or EHR, is defined as "a longitudinal health record and includes all information contained in a health record such as a patient's health profile, behavioral and environmental information" [1]. This information includes data obtained from multiple episodes and providers, with the intention of being a lifetime medical record. The EHR contains all the personal health information belonging to an individual, is entered electronically by healthcare providers over the person's lifetime, and extends beyond inpatient care to ambulatory

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care settings [2].

Numerous healthcare facilities from across the globe have implemented EHR systems to improve the information recording process but only a few have been successful [3]. The percentages of failures are alarmingly higher in adoption and meeting the desired benefits from the implementation. More than 50% of EHR systems either fail or fail to be properly utilized [4][5][6]. Resistance and opposition in changing from the paper-based systems to electronic systems may create some problems [2]. Some other issues contributing to the stats include the lack of pre-implementation activities [4], lack of organizational readiness [7][8][9], unavailability of technology, funding and lack of technical and computer skills of personnel [10].

Readiness assessment can help healthcare facilities identify barriers to a successful EHR system implementation and measure the preparedness of the organization as well as its available resources and areas to improve. Ghazisaeidi et al. [11] recognized readiness assessment as the most important step prior to implementation and an essential requirement for the success of EHR in terms of adoption rate or acceptance. Readiness assessment, as a comprehensive measure in order to provide a proper image of existing conditions and the preparedness of healthcare organization to change, is also a way to identify potential cause of failure in innovation such as organizational resistance. Khoja et al. [8] emphasized that readiness assessment becomes important because of potential resistance to the implementation of EHR. Readiness assessment evaluates the preparedness of an organization and it leads to improved decision making and planning strategies.

An electronic health record system has the potential to improve the overall quality of health services including the availability and reliability of health information. Identifying the barriers will be a precursor to assessing readiness to adopt an EHR system. This paper reviews the literature identifying barriers to implement an EHR system.

2. Methods

A structured literature review was done to identify the barriers that relate to EHR readiness. The said review was done in accord with Preferred Reporting Items for Systematic Reviews and Meta-Analysis, or PRISMA guidelines for systematic review and meta-analyses.

2.1. Search strategy

Articles for this review were gathered from the electronic database ProQuest. The search strategy included four categories of keywords: (i) "readiness" OR "readiness assessment"; (ii) "electronic health" OR "e-health"; (iii) "electronic health record" OR "electronic medical record"; and (iv) "readiness" OR "readiness assessment" AND "electronic health" OR "e-health".

2.2. Study selection process and data extraction

An article was included if it satisfied the inclusion criteria: (1) publication (the article was published in a scholarly journal no later than July 2016); (2) language (the article was written in the English); (3) status (the article's full text is available); and (4) content (the article listed barriers to the implementation or adoption of EHR or EMR). An article was excluded if it presented a meta-analysis of barriers.

All titles and abstracts were screened for potentially eligible studies. Initially two reviewers screened all titles and abstracts for potentially eligible studies. Studies that did not meet the criteria were deleted from the list. Disagreements were resolved through group discussion. All reviewers then evaluated the full text of each study independently to make the final selection of relevant articles to include. Studies were reviewed by the researchers to ensure they complied with the inclusion and exclusion criteria. The selected data sources were collated and summarized using a spreadsheet application.

The researchers identified barriers from each of the studies that met the inclusion criteria. A list was organized using a shared spreadsheet. The identified barriers which were regarded similar in nature, during the group discussion, were merged. A researcher was assigned to initially categorize the barriers based on the definition of the information systems resource. After completing the process, the rest of the researchers underwent iterations to categorize the barriers. The components of information systems as specified in O'Brien et al. [12] - people resources,