Journal of Taibah University Medical Sciences (2014) 9(3), 213–218

Taibah University

Journal of Taibah University Medical Sciences

www.sciencedirect.com

Original Article

Physician satisfaction with electronic medical records in a major Saudi Government hospital

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Received 20 November 2013; revised 2 January 2014; accepted 5 January 2014
Available online 10 July 2014

الملخص

أهداف البحث: تهدف هذه الدراسة لقياس مستوى رضا الطبيب عن نظام السجلات الطبية الالكترونية، و تهدف أيضاً لتحديد الصفة الفردية الخاصة بالسجلات الطبية الإلكترونية ذات الصلة بمستوى رضا الطبيب عن النظام.

طرق البحث: طُلِب من أطباء قسم التنويم تعبئة استبانة ذاتية. وتم استخدام معامل ارتباط بيرسون لتحديد أي من صفات النظام الفردية ذات علاقة قوية مع الرضا العام عن النظام. بعد ذلك تم تطبيق اختبار الانحدار الخطي لدراسة العلاقة بين الثلاث مجالات الرئيسة للاستبانة والرضا العام عن النظام مع مراعاة الضبط للخصائص الشخصية للطبيب.

النتائج: أجاب 115 طبيبا على الاستبانة. وخالف رضا الطبيب بنظام السجلات الطبية الإلكترونية التوقعات. حيث كان 40% من الأطباء فقط راضين عن النظام بشكل عام. وكانت أهم الخصائص للتنبؤ عن رضا الطبيب للنظام أداء النظام من ناحية السرعة، وهي الإندماج مع سير العمل ومعلومات النظام كالدقة، والكمال، والوقت الخاصة بمعلومات المريض.

الاستنتاجات: كان الأطباء بشكل عام غير راضين عن النظام المثبت. ينبغي أن يوجه التقييم المستمر للأنظمة المثبتة والملاحظات من مستخدمي النظام الاختيار مستقبليا وتنفيذ أنظمة السجلات الطبية الإلكترونية.

الكلمات المفتاحية: السجلات الطبية الإلكترونية; الأطباء; الرضا; المستشفيات الحكومية; المملكة العربية السعودية

Abstract

Objectives: The objectives of this study were to measure physician satisfaction with a recently introduced electronic medical record (EMR) system and to determine which of the individual attributes of EMR were related to physician satisfaction.

Methods: One year after introduction of an EMR system, physicians in an inpatient department were asked to answer a self-administered survey. Pearson's correlation coefficient was used to determine which attributes were significantly related to overall satisfaction with the system. Linear regression analysis was then performed to examine the association between the three main domains of the questionnaire and overall satisfaction with the system, with adjustment for physician demographic characteristics.

Results: A total of 115 physicians answered the survey. Only 40% were satisfied with the system overall. The best predictors of overall satisfaction were performance in the form of speed, integration with workflow, and patient information, such as accuracy, completeness and timeliness.

Conclusion: Physicians were generally not satisfied with the system. Continued evaluation of such systems and feedback from users should guide future selection and implementation.

Keywords: Electronic medical records; Governmental hospital; Kingdom of Saudi Arabia; Physicians; Satisfaction

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Peer review under responsibility of Taibah University.

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http://dx.doi.org/10.1016/j.jtumed.2014.01.004

Introduction

Hospitals around the world are using electronic medical records (EMRs) to help health care providers to deliver safer, better care to patients.[1,2] EMR systems offer automated electronic information processing for physicians in their day-to-day work.[3] The extent to which these systems are successful depends strongly on the acceptance of the physicians regarding the performance of such systems.[4,5]

Generally speaking, physicians prefer EMRs and consider that these systems eliminate much paperwork and enhance the methods by which they monitor their patients' progress.[6] Furthermore, EMR technology offers many benefits, such as legibility and completeness of medical information and documentation, immediate access to information anywhere at any time, a large clinical database and decision-support techniques.[7] The introduction of new information technology systems into an organization is certain to change the workflow,[8] and sometimes users are dissatisfied because of problems in using the system that result in delays in ordering and disturb the workflow.[9] Several studies indicate failure of EMR systems due to lack of user input and lack of evaluation of feedback on use of the system.[10–12]

Despite the drive by the Saudi Government to expand the information technology infrastructure in the health care system, particularly the nationwide transition from paper-based medical records to EMRs, to the best of our knowledge the level and extent of use of EMRs has been addressed in only two studies.[2,13] Neither specifically described physicians' views on EMRs. The objective of the study reported here was to gain a better understanding of physicians' satisfaction with EMRs. We therefore report the results of a survey conducted in a local Government hospital in Kingdom of Saudi Arabia to identify the attributes of EMRs that are related to physician satisfaction. The results are expected to help decision-makers improve subsequent deployment of EMRs.

Materials and Methods

Study site and setting

This cross-sectional analytical observational study was conducted in a 360-bed Government hospital in the Eastern Province, Kingdom of Saudi Arabia. The hospital has a commercially available EMR system provided by the Ministry of Health, use of which is mandatory in all departments of the hospital. 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 study was conducted 1 year after introduction of the system in the hospital. 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.

Survey preparation and data collection

The tool used to collect the data was a self-administered survey based on the DeLone and McLean model,[14–16] borrowed from the business world to measure the success of information technology systems and used extensively to measure physician satisfaction with EMRs. The survey was based on a previously validated survey,[17] supplemented with items selected after a thorough review of the relevant literature. The survey consists of 31 questions that cover the user's sociodemographic characteristics and satisfaction with the system. It is divided into four domains: the first (seven items) addresses overall satisfaction with the system, with questions about its performance, preference for paper records and preference for a different system; the second (eight items) addresses system performance quality, with questions about the ease of use of the system, speed and integration with the workflow; the third domain (seven items) addresses the quality of the information, with questions about the completeness, accuracy and availability of information at the right time; and the fourth domain (three items) addresses service quality, with questions about introduction of the system and training.

The responses were given on a five-point Likert scale, ranging from "strongly disagree" (1) to "strongly agree" (5). The reliability of the items was evaluated with Cronbach's alpha, and the values were all above 0.82, indicating satisfactory reliability. The face validity of each item was assessed by the research team, a practising physician and experts in informatics. After a pilot test of the survey conducted with 10 physicians, some of the questions were reworded and rearranged.

The survey was distributed directly to 220 physicians between 30 March and 25 May 2010 under the guidance of the Medical Director and the head of the information technology department. Participation was voluntary, and respondents were assured that their responses would remain confidential. Approval for the study protocol was received from institutional review boards of both the hospital and the University of Dammam.

Statistical analysis

Summary statistics for the study population were calculated as frequencies and proportions for categorical variables, and means and standard deviations for continuous variables. Negative statements were reversed. To simplify the presentation of level of satisfaction, the scale was collapsed, such that responses 4 and 5 were combined into "satisfied" and 1, 2 and 3 into "not satisfied". Pearson's correlation coefficient was used to determine which individual attributes of the system were significantly related to overall satisfaction with the system. Mean overall satisfaction was determined by averaging the answers to the seven questions. The remaining items on the questionnaire were then correlated with the mean overall satisfaction score. Linear regression analysis was performed to examine the association between the three main domains of the questionnaire and overall satisfaction, with adjustment for physicians' demographic characteristics. An alpha of <0.05 was considered to be statistically significant. Stata 12 was used for the analyses.

Results

Of 220 physicians who used the system daily in inpatient departments, 115 were included in the final analysis,