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Usefulness of the functionalities of an Electronic Medical Record on a Latinamerican Medical Web Portal

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Abstract

The medical record is a key component in the modern health systems, a fundamental basis of higher functionalities that guaranties quality care and the possibility of improved clinical management. The dissemination of information systems for the electronic medical record (EMR) has a growing acceptance and use in developed countries. This type of recognition however has not been widespread in Latin America. Realizing this we conducted a web survey to users of a Latin American medical portal to assess their perception of the EMRs usefulness. Among the results we found that over 90% of respondents were in favor of its use, with values that exceed 80% in the analysis of the utilities by categories. More in-depth studies are needed to determine the reasons for the lack of dissemination and implementation of EMR in our region.

Keywords:

Data Collection, Computerized Medical Record Systems, Medical Records.

Introduction

There is now enough evidence that supports the fact that electronic health records improve quality of care and that it optimizes the costs of the process [1]. Despite the evidence, the use of this tool has not flourished in Latin America.

The Institute of Medicine (IOM) stated that the electronic clinical record should be a longitudinal collection of electronic health information provided by any member of the healthcare team. They also stated that records should provide real time access to authorized users; the EMR should also provide knowledge bases and decision support systems to improve the quality, safety and efficiency of patient care [2]. Some observational studies found that there are practical, logistical and organizational constraints that reduce the effectiveness of the traditional paper record to store and organize the growing number of clinical observations. The electronic medical record (EMR) was designed to overcome many of these limitations, as well as to provide additional benefits that can not be obtained through a static view of events [3-5]. These technologies have spread rapidly in the developed world, with varying degrees of acceptance by professionals. Many studies have evaluated its utility either from the use or the selection of the system [6-8] but in much of Latin America the use of an EMR has not expanded the same rate as the rest of the world [9]. This may be due to either economics or adoption resistance from healthcare personnel [10-13]. Several studies on EMR usefulness have been published in the United States and Europe [14-16], with favorable results in the values of utility and degree of agreement with these informatics systems.

The objective of this paper is to evaluate the perception of usefulness and use of EMR to users of a Latin-American medical web portal.

Materials and methods

This work was done in the medical web portal called IntraMed (www.intramed.net) that is a medical network of science content with distribution in the geographic area of Latin America, with over 250,000 subscribers and a frequency of use of approximately 50,000 different users per month. The site has the functionality that enables the professional specialist or user to target relevant content. The site has 480 main pages with knowledge subsets for 32 medical specialties by region (15 countries). In each of these dynamic pages by specialty, the content is structured with news, medical articles, continuing medical education and events. There is also content common to all non-medical specialties and notes of general interest.

The study was conducted using an "e-research" framework, a study/survey methodology that uses the Internet to obtain the results [17]. The survey was developed using a structured questionnaire available online to users registered to the site. It was available at the site between July 15 to August 15, 2008. This inquiry assumed that the "online" study population was limited to Internet users accessing this website. The study was cross-sectional and descriptive. The characteristics of the electronic survey were to be in structured format and optional filler.

Measuring instrument: The survey was developed based on a Likert scale of 5 points, covering the classification from very

useful to useless. The development of the survey was supervised by the epidemiology and statistics area of the Hospital Italiano de Buenos Aires. Survey validation was done with 20 users who analyzed and answered 50 questions. After analysis the total number was reduced to 40 to eliminate the confusing or non relevant.

The survey was available for all users once they entered the Intramed web portal, after validation by username and password. At the survey introduction, the prospective survey taker had the option to answer at this moment, do it later or not answer. After this they would either continue with the survey or be thanked. In either situation the survey would not be re-requested when accessing the site at subsequent times.

If the user agreed to take the survey he or she was presented with text explaining the purpose of the study and the voluntary acceptance of their data as part of that investigation. The responses were stored in a database that conserved the demographic information and the selected choices with absolute technical impossibility of identifying the user's personal data.

The survey assessed the perception of users regarding the functional benefits of the EMR in the following domains (Figure 1):

1. **Functions of the proper EMR**: registry of the progress notes, list of medical problems.
2. **Documentation functions**: recording lab results, registration of images, scanning and storage of physical documents in the EMR, documentation of vital signs.
3. **Functions related to preventive care and decision support system**: record of immunization, registered allergies warning, and reminders about the implementation of preventive practices.
4. **Prescribing and ordering functions**: medication registration, consult medication prescriptions recorded and print them.
5. **Referrals related functions**: to receive response of the Referrals professionals.
6. **Health education and access for the patients (PHR)**: submit reminders to patients by phone or mail, to enable patients to access information about their histories prior authorization of the professional, create and print education programs and information for their patients.
7. **Administrative functions**: would be able to use administrative data from other centers that use the system, data coverage from patients.
8. **Interoperability**: the ability to encode diagnosis of their patients, share their recorded information of the patients with other professionals.

We also requested the following: (Figure 2):

- Year of professional certification (graduation)
- Work location(s).
- Private or public or both workplaces.
- If they used some type of personal device (PDA) and/or computer systems for recording patient information (in cases that this answer was yes, the survey instrument registered the type of system they used).
- Describe main shortcoming of the system.
- Training received (or did not) to use the system.
- The availability of technical assistance.
- The registry format used.
- Finally, if they would continue using traditional registration in paper and if they would use an EMR.

The results were expressed with frequency and percentage.

Results

The survey was available at the medical web portal for users of this website, between July 15 to August 15, 2008. During this period over 16,702 different users entered in the portal (exposed population) of whom 5171 users responded to the survey (30.96% response rate), 70% were Argentineans. Sixty-five percent (65%) of the respondents worked in pediatrics, internal medicine, surgery and gynecology.

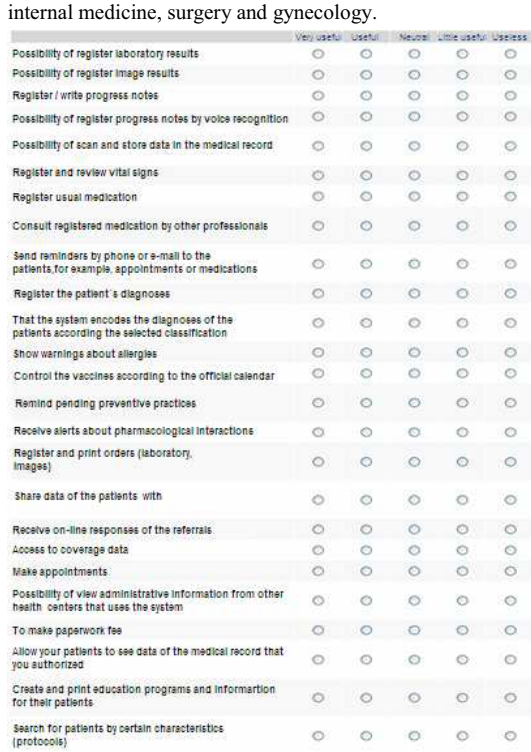

Figure 1 – Questions as useful domains.

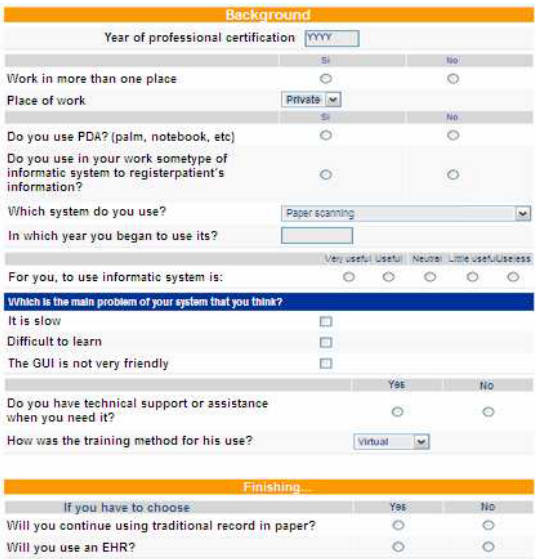

Figure 2 – Context questions.

Context Characteristics

With regard to the context of the workplace of the respondents: 69% of professionals worked in more than one place, with 47% of those working in both the private and public sectors. Sixty-one percent (61%) used personal electronic devices, and 56% had an informatic system at their workplace (12% digitizing, 31% own informatics developments, the rest divided between document scanning systems, vendors development and other systems). Thirty percent (30%) began using devices less than 5 years ago, while 40% have been using between 5 to 20 years. The complete results of the domain of context can be seen in Table 1.

Utility of the functionalities

Analyzing the functionalities, the results were the following (Table 2):

A. Functions of the EMR itself

To record or write progress notes: 95% found it useful or very useful, while only 1% disagreed and felt that this feature was not useful or useless.

Progress notes recorded with voice recognition: were evaluated as useful or very useful in 58% of cases and useless or unhelpful in 13% of cases.

Availability of a list of diagnoses of their patients in the EMR: was found to be useful or very useful by 96% of respondents.

B. Documentation functions

Ability to record laboratory results: was considered useful or very useful in 97%.

Recording of the images: was useful to 95% of the survey respondents.

Scanning and storage of physical documents in the EMR: was considered useful or very useful in 87%.

Documentation of patient vital signs: was at 88% useful or very useful.

Table 1 – Context characteristics of the users that answered the survey

Context	n	%
Male	3309	64
Average age (years)	47	
Years from certification:		
<10 years	1445	27
10-20 years	1186	23
>20 years	2353	47
Work in more than one place	3565	69
Workplace:		
Private	1444	28
Public	962	18
Both	2445	47
Use of electronic devices	3176	61
Use of health information system	2880	56
Which system:		
Digitizing	603	12
Scanning	134	3
In-house development	1606	31
Vendors development	509	10
Since when you use it:		
<5 years	1569	30
5-10 years	846	16
10-20 years	1186	23
>20 years	695	13
As regards the utilization:		
Useless/Little useful	36	0.7
Neutral	82	2
Useful/Very useful	4814	93
System deficiency:		
Slow	2110	41
Difficult	514	10
Unfriendly	1445	28
Do you receive support?	2103	40
How was the training:		
Virtual	465	9
Face to face	1103	21
Both	624	12
Others	1405	27
Non response	1574	30

C. Functions related to preventive care and decisions support

Warnings on recorded allergies of the patient: were found useful or very useful in 94% of cases.

Immunization record: was at 86% of the cases.

To receive reminders about the implementation of preventive practices: 87% of respondents found it useful or very useful.

Drug interactions warnings: this value was 91%.

D. Prescription and orders functions

Register usual medication: was useful or very useful in 96% of the time.

To consult recorded medication by others professionals: were 91% useful.

To record and print prescriptions: were considered useful or very useful for 85% of respondents.

E. Referrals related functions

To receive responses of the referrals professionals: 84% of respondents found useful or very useful.

F. Health education and access by patients (PHR)

Send reminders to patients by phone or mail: was evaluated as useful or very useful by 75%.

Allowing patients to access information about their histories, prior authorization by the professional permission: was considered useful or very useful 55% of the time, 25% of the professionals maintains a neutral position.

To create and print information and education programs for their patients: was found useful or very useful 84% of the time.

G. Administrative functions

Respondents rated as useful or very useful knowledge of the details of health insurance of their patients (75%), methods for allocating appointments (72%), the display of administrative information (66%) and the ability to search for patients according to certain characteristics for research studies (85%).

H. Interoperability

The professionals found the possibility of coding the diagnosis of their patients, as well as share registered information of their patients with other professionals very useful or useful in 83% of the time.

The 93% of respondents found useful or very useful to use informatics systems. When questioned about which system weaknesses you find most disturbing 40% said that the slowness, 28% to be unfriendly or less intuitive and 10% argued that the difficulty of use was the most glaring deficiency.

With regard to training and use: 41% of users of informatics systems have responded that count with technical support or assistance when needed. Regarding training, 9% did so in a virtual way, 21% face to face, 12% both ways, 27% used other methods of training and 30% did not answer this question.

As final answer, 60% of respondents said that would not still using paper records, while 28% prefer to continue using it. Finally 93% responded they would use EMR, while only 4% expressed as negative.

Discussion

While the survey had a large range and was answered by over 5000 people from more than 21 Spanish-speaking countries, we recognize the limitations of this study. It may be biased because the surveyed were users of a website which could be interpreted as an indirect indicator of their preference or ability to deal with software tools. In any case it was an interesting initial sample which analyzed EMR utilities for Latin-American health professionals.

Table 2 – Perception of the functionalities of the EMR

	Functionalities	Useless (%)	Little useful (%)	Neutral (%)	Useful (%)	Very useful (%)	NR (%)
A	Register / write progress notes	0,31	0,85	2,32	19,49	75,46	1,57
A	Possibility of register progress notes by voice recognition	4,45	8,88	25,51	21,95	36,2	3,02
A	Register the patient's diagnoses	0,19	0,25	1,37	18,66	77,63	1,9
B	Possibility of register laboratory results	0,12	0,37	1,12	18,58	78,8	1,01
B	Possibility of register image results	0,21	0,7	2,42	20,17	75,29	1,22
B	Possibility of scan and store data in the medical record	0,79	2,24	8,24	29,43	57,55	1,74
B	Register and review vital signs	0,68	1,8	7,54	31,04	57,05	1,9
C	Show warnings about allergies	0,23	0,5	3,35	21,74	72,23	1,95
C	Control the vaccines	0,7	1,64	9,21	32,66	53,01	2,78
C	Remind pending preventive practices	0,62	1,3	8,7	35	51,89	2,49
C	Receive alerts about pharmacological interactions	0,31	0,85	5,12	27,11	64,36	2,24
C	Send reminders by phone or e-mail	1,64	4,87	16,79	33,84	40,8	2,05
D	Register usual medication	0,17	0,21	1,9	25,45	70,61	1,66
D	Consult registered medication by other professionals	0,37	0,99	5,41	32,99	58,4	1,84
D	Register and print orders	0,93	2,15	9,19	30,44	54,52	2,78
E	Receive responses of the referrals	0,93	2,07	10,06	33,24	51,09	2,61
F	Allow your patients to see data of the medical record that you authorized	6,73	9,44	25,64	30,4	24,17	3,62
F	Create and print education programs and informartion for their patients	1,2	2,13	10,13	36,51	47,3	2,73
G	Access to coverage data	1,06	2,69	17,62	38,64	37,19	2,8
G	Make appointments	1,78	3,64	19,24	36,3	36,07	2,98
G	Possibility of view administrative information from other centers	2,03	4,8	23,26	32,22	34,15	3,54
G	To make paperwork fee	3,71	6,07	27,29	30,28	29,18	3,46
G	Search for patients by certain characteristics (protocols)	1,06	1,8	9,38	30,77	54,28	2,71
H	That the system encodes the diagnoses	1,14	2,63	10,95	28,06	55,06	2,17
H	Share data with colleagues	0,91	2,26	11,6	37,69	44,98	2,55

Regarding the context, there is a tendency in favor of males, which also can be observed for those with more than 20 years of graduation. More than half of respondents worked in more than one place, and most of them are in favor of the use of computer systems.

All the functionalities of the EMR, with the exception of the PHR and administrative applications, were categorized as useful or very useful with high values of acceptance.

The lowest values obtained were in the area of the PHR, which may be because it is a relatively new tool, little known, which raises security and confidentiality dilemmas still not entirely resolved. A deeper analysis will be necessary to explore these issues. This area also had high percentages in neutral rating.

The categories of the EMR functionalities such as progress notes or diagnosis registration, documentation and preventive care were the highest rated in the study.

With respect to the support and training, less than half of respondents stated that did not have support or assistance. A minority was trained virtually; overall there was a high rate of non-response for this particular question. There seemed to be some discrepancy between the usefulness of virtual training and the low values for these types of educational tools in this question.

In conclusion, our research has shown a consistently positive trend towards the use of EMR in the Latin American physician population. Further studies are required to more deeply explore the reasons for the slow dissemination and limited implementation in the field of health in Latin-American region, despite the fact that opinion surveys show high rates of agreement in favor of its usefulness.

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