EDUCATION & TRAINING

The Association between Computer Literacy and Training on Clinical Productivity and User Satisfaction in Using the Electronic Medical Record in Saudi Arabia

May Alasmary · Ashraf El Metwally · Mowafa Househ

Abstract The association of computer literacy, training on clinical productivity and satisfaction of a recently implemented Electronic Medical Record (EMR) system in Prince Sultan Medical Military City ((PSMMC)) was investigated. The scope of this study was to explore the association between age, occupation and computer literacy and clinical productivity and users' satisfaction of the newly implemented EMR at PSMMC as well as the association of user satisfaction with age and position. A self-administrated questionnaire was distributed to all doctors and nurses working in Alwazarat Family and Community Center (a Health center in PSMMC). A convenience sample size of 112 healthcare providers (65 Nurses and 47 physicians) completed the questionnaire. A combination of correlation, One Way ANOVA and t-tests were used to answer the research questions. Participants had high levels of self-reported literacy on computers and satisfaction of the system. Both levels were higher among physicians than among nurses. A moderate but significant (at $p<0.01$ level) correlation was found between computer literacy and users' satisfaction towards the system ($R=0.343$). Age was weakly, but significantly (at $p<0.05$), positively correlated with satisfaction with the system ($R=0.29$). Self-reported system productivity and satisfaction was statistically correlated at $p<0.01$ ($R=0.509$).

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High level of satisfaction with training on using the system was not positively correlated with overall satisfaction of using the system. This study demonstrated that EMR users with high computer literacy skills were more satisfied with using the EMR than users with low computer literacy skills.

Keywords Computer literacy · Training · EMR satisfaction

Introduction

EMR and its benefits

Electronic Medical records (EMR) can be defined as an application environment that captures clinical data of patients individually composed with clinical decision support system, computerized order entry and clinical documentation applications [1, 2].

EMR is considered one of the most crucial healthcare technologies that is characterized by a wide-range of capabilities, and thus offers the greatest potential for improving the quality of healthcare [3]. Shifting from paper-based into EMR could be a cumbersome process. However, such a change would optimize and benefit the healthcare services in several ways, including: Lowering the costs, improving risk management, reducing the number of medical errors, improving the quality of patient care, eliminating paper-based errors (e.g. illegible handwriting), offering more organized notes from patient visits and test results and providing rapid access to comprehensive clinical information of patients to their healthcare providers [2, 4].

Most health institutes in both developed and developing countries are shifting to EMR with an ultimate aim of improving patient data management and improving efficiency in healthcare. Successful and organized Shifting to EMR is challenging but has a proven benefit. Evidence also shows

that, for an optimum use of such technologies, healthcare providers should appreciate its real benefits and potential and be aware of how to efficiently implement them [5].

EMR adoption barriers

Nationwide, user adoption among healthcare providers is considered an essential factor in maximizing benefits of an EMR implementation. The literature provides evidence of failed clinical system implementations due to number of challenges and barriers [6].
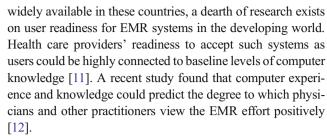
Several technological impacts and social issues could be the reason to slow or prevent the implementation of EMR or lead to implementation of an unproductive system. EMR adoption could be critical for developing effective implementation plans that can support and enhance user satisfaction [7]. Two major aspects could determine the success of implementation of EMR systems; these are the technological and human factors. Moreover, three major categories of barriers could highly impact the adoption of EMR systems: Organizational, economic and behavioral barriers. Organizational barriers depend on the type of the organization including level of clinical managerial expertise. Included in organizational aspect, is whether or not a practice is affiliated to a hospital. This is an important determinant of EMR adoption [8]. The second category is the economic burden that includes start-up costs within the purchasing and ongoing costs that are associated with coordinating, monitoring, upgrading, and governance costs. In addition, there are costs related to software licensing, support, networking and productivity losses due to time spent in training [9]. The third category is behavioral barriers which include user acceptance and resistance to change. Thus, it is important to examine behavioral and social aspects that are impacted by the introduction of the EMR. Users concerns regarding the change of EMRs could be based on knowledge, perceptions and lack of technical training and support from vendors [6, 8].

In all EMR systems, data entry is considered to be expensive and time consuming. Therefore, the use of intelligent EMR tools is desirable and should be a selected field for future innovation [10].

Computer literacy and EMRs

Practicing medicine using technologies like EMR systems can be a challenge for some users specially that this technology could be highly associated with computer literacy.

Many studies have been done on user satisfaction on EMR; however, to our knowledge, no study has been conducted to identify the association between computer literacy, user satisfaction and the clinical productivity of EMR, particularly in developing countries. In today's highly technical world, few hospitals in the developing world have actually implemented EMR system. Since the use of the EMRs are becoming more widely available in these countries, a dearth of research exists on user readiness for EMR systems in the developing world. Health care providers' readiness to accept such systems as users could be highly connected to baseline levels of computer knowledge [11]. A recent study found that computer experience and knowledge could predict the degree to which physicians and other practitioners view the EMR effort positively [12].

The usefulness of EMR systems has been evaluated overtime using analysis by measuring satisfaction of users and measuring actual and effective use. Analysis of actual and effective use of electronic medical records was found to provide more information than user satisfaction or functionality of such systems. Assessing actual and effective use of electronic medical record systems by measuring the frequency of use had been employed as an indicator of how well the system have been adapted to clinical work mainly because any successful system should be used by most of health care professionals [13].

The association between the computer literacy and the level of satisfaction and/or improved quality of usage of EMR systems is still poorly understood. Factors that can be associated with the success of EMR systems has been related to a host of factors, particularly those associated knowledge of the users about the system either in engaging them within the steps of acquiring the system or training them on the new system. Sufficient EMR training is expected to have a positive relationship with the satisfaction [14].

The objective of this paper is to investigate the impacts of computer literacy, EMR training on clinical productivity and user satisfaction with the EMR.

EMR in Saudi Arabia

EMR adoption concepts have evolved since the 1960's. However, EMR systems adoption is considered to be a new healthcare trend within the Middle East especially in Saudi Arabia where full implementation hadn't took place yet within Saudi Arabian healthcare organizations. Similar to any adoption of any new technological tools, many challenges were and still facing the adoption of EMRs within Saudi Arabia. Some of those challenges could be associated with technical aspects related to implementation or adoption, including instability of vendors, confidentiality and privacy of patient information, lack of standards, and system speed issues. Some other barriers exist such as lack of awareness and experience with the use of computers [15]. Various studies have examined the role of and challenges of EMRs and related technologies in Saudi Arabia [16–26].

In this study, computer literacy and training were studied to explore their association with the three main goals of any system: Clinical productivity, clinical efficiency and EMR satisfaction.

Related literature

Few studies investigated the link between several factors that could impact users' satisfaction one of those factors is computer literacy. The literature has showed that computer literacy could be a determinant for implementation of EMR. Individual perceptions about their computer literacy could be a primary indicator of the success of EMR. Few studies were conducted to demonstrate the fundamentals of computer literacy that are relevant to EMR systems.

Some studies documented that the success of the EMR was relevant to users with advanced computer knowledge. Of these studies, one by Morton M. [6] that investigated factors affecting physician attitudes in using and accepting Electronic Health Record (EHR). The study results showed that the majority of respondents who used computer on regular basis also used the EMR system in a frequent manner. However, the majority of the respondents in this study rated themselves knowledgeable in computer skills, a finding which might not be perceived by many healthcare providers in developing countries [6].

Another study, by Laerum et al., in 2007 [27] investigated the usefulness of different systems by comparing their use in general clinical tasks. The study also explored the role of computer literacy, availability of computers and user satisfaction. Results of this study showed that EMR is only being used for a minority of healthcare tasks. Respondents scored high in computer literacy and had an overall high positive satisfaction scores which was not consistent between users of different systems.

Another study by Terry et al. was conducted in 2008 to investigate Healthcare Providers' Perceptions towards Health Information Applications at King Abdul-Aziz Medical City (Saudi Arabia). The main concepts investigated were benefits, barriers, and motivations of using health information applications and computer literacy. Results showed that respondents had good knowledge and skills for using such information applications. Results also indicated that most respondents who had training in IT had also good IT applications skills. Correlation analysis showed that training had a positive impact on the computer skills and knowledge [11]. However, the use EMR requires high level of computer skills. Therefore, users' satisfaction could be highly associated with those skills [8].

Studies from Prince Sultan Military Medical City (PSMMC)

Shifting to EMRs is a way to improve the quality and consistency of the source information from which all future care and plans are generated [28]. Few studies have been conducted in PSMMC. The first relevant study investigated the challenges for implementing EHR record systems by Alanazy A. [15]. The study focused on the following potential barriers: Lack of awareness towards the usefulness of EHR, high cost of adoption, resistance to new technologies, instability of new software providers, patient confidentiality and privacy issues, lack of experience with the use of computers, software quality and ease of use, access security and finally lack of adoption of uniform standards. To study such barriers, a questionnaire was distributed on healthcare providers in major hospitals in Saudi Arabia and included PSMMC. The study found that there is a strong association between health care professionals' attitudes towards EMR and their level of computer proficiency. In addition, older healthcare providers generally showed unfavorable attitudes toward computer [15].

The second relevant study revolved around physicians', nurses' and patients' perception of hospital medical records in PSMMC. One of the factors investigated was the perception and attitudes of future implementation of EMR systems. Physicians had low scores for computer literacy, ranging from 1 % for prior computer experience to 27 % for owning a computer. Participants were not enthusiastic about the change to electronic medical records with only 8.7 % of them having the needed computer skills. Overall, 31.3 % of the physicians stated that it was time to move to EMR, 90 % believed that EMR would add the burden of the entry of data and 81.6 % reported that it would decrease productivity [29].

The previously mentioned studies from PSSMC indicate that the level of acceptance and satisfaction of healthcare providers towards the use of EMR depends on their computer skills. Studies also showed that younger gener2ations are more accepting to using a new EMR system while older employees showed more resistance for its use attributed to perceived insufficient computer skills.

Statement of purpose and study objectives

The goal of this study is to investigate the association between Computer literacy and training with the clinical productivity and satisfaction of Electronic Medical Records. This study seeks to investigate the following specific objectives:

– To investigate end users, specifically physicians and nurses, satisfaction levels of a newly implemented EMR system in Prince Sultan Medical Military City (PSMMC) in Riyadh.
– To investigate clinical productivity of the newly implemented Electronic medical record system
– To investigate the association between computer literacy and EMR users satisfaction perceptions
– To investigate the association between training and users satisfaction.

The Research question of this study is "Do computer literacy, training have an impact on clinical productivity and satisfaction of Electronic Medical Record?"

Settings and EMR

eMedServe system was implemented in August 2011 at PSMMC, specifically in Alwazarat Health Center (WHC). The latter is specialized in Family and Community Medicine (F&CM) and served by around 200 employees. eMedServe can be classified under EMR but with some unique settings as a Health Information System (HIS) in automation of all the business processes [30]. The core concept of the system is the usage of Business Process Management (BMP) which makes it a process oriented system that can be customized whenever the real workflow is changed or modified [31]. The main purpose of the system is to automate all the business processes and to convert the whole system into computerized one to achieve a paperless and timely system. The system serves several specialty clinics within WHC and links it with the pharmacy, lab and radiology department. Moreover, the system provides integration capabilities where it can be used to integrate all the business applications.
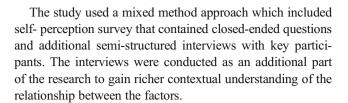
Training

Satisfaction and clinical productivity not only could be effected by computer literacy on its own. The training on the new system could highly impact all the previous mentioned sectors. A full training plan was conducted on the system by the hospital where an enforced policy of mandatory training to all users of the systems by developing training log and training attendance. The physicians training sessions included five sessions per week which included full orientation about the system and under supervision practicing on the system until the user master it by the fifth session. Similarly, the nurses were trained during three sessions per week and two additional days were added if needed to master all functions of the system. Each training session started with a full presentation of the system processes and an orientation of how it works to demonstrate a full understanding of the system. The second part of the session included a component that allowed users to access and work with all parts of the EMR.

Methodology

Study design

A cross-sectional study design was used to investigate the relationship between the computer literacy, perceived clinical productivity and the level of satisfaction of physicians and nurses working in PSMMC and have been exposed to the a new EMR system implemented in this major hospital in Riyadh. The study also aimed at assessing the relationship between perceived productivity/satisfaction of the new system and perceived level of computer proficiency, age, gender, Position and experience.

The study used a mixed method approach which included self- perception survey that contained closed-ended questions and additional semi-structured interviews with key participants. The interviews were conducted as an additional part of the research to gain richer contextual understanding of the relationship between the factors.

Sample

The sample for this research was a convenience sample of physicians and nurses of "Al-wazarat Family and community center" of Prince Sultan Medical Military City. We selected doctors and nurses as they represented the majority of employees that use the core parts in the EMR system. All physicians and nurses working in the health center ($n=$ 123) were invited to complete the survey. This particular health center includes 25 clinics that have fully implemented a built-in Electronic Medical Record System.

Data collection procedure

A self-administered paper based questionnaire (Appendix) was distributed to all physicians and nurses who are current users of the system. All invited health providers completed the questionnaire, but data from 12 participants that were used in the pilot phase of the study were excluded. The questionnaires were filled anonymously. Participation was voluntary and the study was reviewed and approved by the by the research unit of both King Saud Bin Abdul Aziz University for Health Sciences and PSMMC hospital.

Questionnaire development

A draft questionnaire was developed based on the identified EMR system functions and review of relevant literature. A paper-based questionnaire was designed to gather information about the following:

– Respondent's Demographic information.
– Training effectiveness perceptions.
– Levels of computer literacy perceptions.
– The EMR productivity perceptions.
– Level of the use of EMR functions.
– Physician satisfaction with the EMR system.

The survey included total of 40 questions. These questions were mainly scored using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). The questionnaire included items about demographics (five questions), training effectiveness (three general perception questions), levels of computer literacy (Ten questions), The EMR productivity perception (five questions), usability and satisfaction (fifteen questions). Each section questions results

were combined as a group variable in the analysis to form set of specific variables.

Pilot study and questionnaire validity

The content validity of the questionnaire was reviewed by quality management personnel within PSMMC hospital, and the level of comprehensiveness the tool was enhanced based on their comments. A pilot study to test the face validity and internal consistency of the questionnaire was conducted on 20 February 2013 by distributing the questionnaire on 12 participants (6 physicians and 6 nurses). Due to the small size of the sample these participants were excluded from the actual study. Eleven out of the 12 participants responded. Adjustment and changes to the survey were done based on the results and the comments provided to ensure that the tool is face valid. A Cronbach's Alpha test was used to measure internal consistency of the questionnaire main domains. Alpha coefficient was used as a recommended method to describe the reliability of factors extracted from dichotomous variables which ranges in value from 0 to 1 [32]. The Cronbach's alpha reliability coefficient was 0.764 which is an acceptable reliability coefficient since it is over 0.7 [33].

Semi-structured interview

Semi structured interviews were conducted by meeting 3 Nurses and 3 Physicians that were randomly selected from the 112 nurses and physicians working in the health center and did not participate in the pilot phase. Qualitative data of the interviews were used to validate the results of the survey and were used to provide accurate understanding of the survey results.

Statistical analysis

Descriptive statistics was performed to describe the characteristics of physician's and nurses' attitudes to EMR characteristics. Correlation analysis was used to study the associations between quantitative variables (e.g. between age and satisfaction scores). T tests and one-way ANOVA were used to compare groups with respect to mean satisfaction sores. All analysis were performed using the Statistical Package for the Social Sciences (SPSS) software; specifically version 20.0.

Results

Users satisfaction

47 physicians and 65 nurses responded to the survey. The high proportion of females reflects the gender composition of the

Table 1 Summary table of descriptive statistics

Satisfaction	Percentage	Number of respondents
Age		
<30	42.9	48
30-40	23.2	26
>40	12.5	14
Missing	21.4	24
Gender		
Male	33.9	38
Female	58.0	65
Missing	8.0	9
Occupation		
Physician	42.0	47
Nurse	58.0	65
Years of experience		
<5	36.6	41
5-10	14.3	16
>10	8.0	9
Missing	41.1	46

participants (63 %). The majority of participants were under 30 years old. Table 1 shows respondents satisfaction rates about the system.

The majority of the participants were generally satisfied with the system (mean=3.04, SD=1.12). Satisfaction scores was higher among physicians (mean=3.19, SD=1.23) than nurses (mean=2.52, SD=1.09). The majority of participants showed that they were satisfied by the system training they received (mean=2.98, SD=1.21). Similar to level of satisfaction of the system, physicians also showed higher levels of satisfaction with training (Table 2). Most physicians and nurses agreed that the system have increased perceived clinical productivity (Table 1).

Correlation analysis was conducted to test association between age and the level of satisfaction with the system. Results of the test indicates that there is a statistically significant weak positive correlation between age and satisfaction (R=0.263) at a significance level of (P<0.05).

Table 2 Mean score of physicians and nurses satisfaction

	Physicians	Nurses	Mean	SD
Satisfaction with the system	3.1922	2.9283	3.0400	1.31
Satisfaction with the training	3.0603	2.9312	2.9864	0.96
The system have increased productivity	0.53	0.62	0.57	0.25
The EMR system have overcome paper	0.65	0.74	0.69	0.27

Another correlation analysis studied the relationship between years of experience and satisfaction. Results show that there is no statistical significance correlation between both variables ($p>0.05$) indicating that total years of experience cannot statistically predict the system satisfaction. On the other hand, the correlation between system productivity and the system satisfaction was statistically significant at $p<0.01$ ($R=0.509$).

Satisfaction with the system and computer literacy

A statistically significant medium positive correlation between computer literacy and satisfaction, $R=0.343$ at ($p<0.01$) level of significant was found based on regression tests. Participants has also high levels of computer literacy (Table 3). The positive relationship between computer literacy and satisfaction showed that the more the participants are satisfied the higher their computer literacy skills (Table 4).

Paired Samples t-Test for the following variables was performed (training and satisfaction, Computer Literacy and satisfaction, age and satisfaction). Results of the tests showed the following:

–   The paired samples t-test of the training and satisfaction failed to reveal a statistically reliable difference between the mean of training ($M=2.98$, $s=0.58$) and satisfaction ($M=3.04$, $s=0.46$)
–   The paired samples t-test of the Computer literacy and satisfaction showed a statistically significant difference between mean of Computer Literacy ($M=3.41$, $s=0.566$) and satisfaction ($M=3.04$, $s=0.46$).
–   The paired samples t-test between the age and satisfaction showed that there is a statistically reliable difference between the mean of age ($M=1.61$, $s=0.74$) and satisfaction ($M=3.04$, $s=0.46$).

One-way ANOVA showed that there was statistically significant differences between means satisfaction of system with age ($p=0.011$; older staff should higher levels of satisfaction), performance satisfaction ($p=0.26$) and

Table 3 Mean score of physicians and nurses computer literacy

	Physicians	Nurses	Mean	SD
Computer literacy	3.7411	3.1630	3.4078	1.36
Daily use of technology	0.90	0.73	0.84	0.36
Type writing ability	2.03	1.48	1.79	0.85
Daily hours of using computer	1.77	1.52	1.67	0.77

Table 4 Percentages of satisfaction and computer literacy

	Physicians (number of respondents)/ (%)	Nurses (number of respondents)/ (%)
Satisfaction with the system	29/61.7 %	9/14.5 %
Satisfaction with the training	21/44.7 %	8/12.9 %
increased productivity	24/53.3 %	24/61.5 %
Computer literacy	41/87.2 %	25/40.3 %

the comparison with paper system ($p=0.008$) and computer literacy ($p<0.01$).

Interviews

The main purpose for conducting the interviews were to validate the consistency within the results and to provide better understanding to the survey results. Therefore, interviews with three nurses and three physicians were conducted. The interviews with the users validated that the satisfaction level with the use of the EMR system was high. They all agreed that training were very beneficial to them. They also agreed that the system has overcome the paper based system mistakes though it was slower due the typing factors and due to technical factors like network slowness. A charge nurse said:

"Gradual improvements of the system will surely make us see more patients like when we used with the paper based system. But, I believe now it became more about the quality of treating the patients not the quantity specially that mistakes now are much less and Physicians can access any information needed in easily and timely way".

The nurses attitudes were very positive about the system overall. Moreover, they agreed that the system did not require any advanced computer skills specially that they all mentioned that their computer skills mainly were basic. However, nurses and physicians attitudes towards the system were mainly positive.

Additionally, all the users that were interviewed believed that some improvements were needed and agreed that the overall clinical productivity has improved. Nurses repeatedly noted that the system is efficient in overcoming coding mistakes commonly encountered in paper-based records. One of the interviewed doctors reported

"The system is so simple now I can access the previous visit of the patient easily and hand writing obstacles and

missing information no longer exist because everything is documented in the system."

Discussion

The primary objective of this study was to determine the factors that could influence physician and nurses' satisfaction and perception towards the new implemented EMR system in PSMMC. Those factors were mainly computer literacy and training. Results of this study show that the majority of the participants were computer literate, and that literacy is positively correlated with the satisfaction of the system.

This study showed a correlation between age and satisfaction. In addition, the majority of the participants showed a high satisfaction rate in the training which was highly correlated with the satisfaction of the EMR system in general. Apparently, after one year of implementation of this new system, users received an acceptable level of satisfaction despite predictions that changes from paper-based to computer-based records initially results in high levels of dissatisfaction. This might be attributed to the mandatory training strategies performed by the hospital. Evidence shows that gradual acquisition of the skills through training could effectively increase users' satisfaction [15], and that users' adoption and satisfaction are highly associated [34]. Type of the training could also determine the satisfaction with EMR systems. Previous studies have shown that one-on-one training have a different impact than the group training [35].

Our results showed that older doctors and nurses were more satisfied with the system than the younger users. This is inconsistent with results from other that showed that older personnel show poor satisfaction ratings [36]. A possible explanation for such a finding could be linked to a statement by a nurse during data collection. She said

"my observations to the doctors in the clinic I could easily say that the younger generation are more computer literate than the older generation but I think that the older physicians are more satisfied with the system because it is an easier alternative for filling lots of forms. On the other hand, the younger doctors might be dissatisfied because they are highly computer literate and such a system is quite boring for them".

Interestingly, an older study that was conducted in 2005 about the readiness for the participants to shift from paper based medical records to EMR in PSMMC showed that "more than 90 % of the physicians admitted that EMR would add the burden of the entry of data and 81.6 % reported that it would decrease productivity" [12]. Putting this in the context of our study's results, it seems that healthcare providers' perceptions towards EMR have improved after real implementation and appreciation of the usefulness of the system.

Study limitations

Several methodological issues need to be discussed. Firstly, the survey was conducted in a convenience sample rather than a random sample of healthcare providers. This type of sampling might have led to over-representation of users with higher levels of satisfaction or computer literacy. In addition, our surveyed population was composed of only doctors and nurses and hence it would not be possible to generalize our results to all healthcare providers using EMR in the hospital. Subjectivity in measuring type performance and computer literacy poses another methodological concern. Surveyed doctors and nurses might have over or under-estimated their level of computer literacy. However, if this is the case we do not assume that there was differential differences in such possible information bias between groups being compare (i.e. those with and without high levels of satisfaction and perceived productivity). Not all computer-related competencies were assessed. The internal consistency of the questionnaire was evaluated as good in the pilot phase. However, test-retest reliability of the data collection tool was not performed.

Recommendation and future work

Future studies should try to avoid our study limitations. Objective measures for productivity and computer literacy can verify and confirm our results. If subjective measures are to be used, checking the test-retest reliability and concurrent validity of data collection tools are necessary to maximize the robustness of measurements and hence the overall conclusions.

Conclusion

The EMR system seems to be effective and highly appreciated by its users in Prince Sultan Medical Military City, Riyadh, Saudi Arabia. Increasing productivity and EMR user satisfaction could be an ultimate goal to any healthcare association. This study has identified a factor that could have an impact of the users' high satisfaction, that is high computer literacy. Results of this study emphasizes the importance of training programs that aims at improving computer literacy among users and ultimately would increase their levels of satisfaction with the system and increase productivity with ease.

Appendix

Satisfaction levels and attitudes towards EMR questionnaire

Introduction:

I am May Alasmary a health informatics master student in King Saud Bin Abdulaziz University in Riyadh. This survey is conducted as a requirement for the master degree. And it is part of a research study about the impact of computer skills and knowledge of high-tech EMR systems on the productivity and satisfaction of the physicians and nurses towards the new system in – Alwazarat Family and Community Center- of Prince Sultan Medical Military city. If you have any questions related to the study, you can contact the research supervisor Dr. Mowafa Househ (+966 1 252-0088 Ext: 43364) househmo@ngha.med.sa; househmo@ksau-hs.edu.sa

Demographics Section:

1- What is your gender?
- o   Male.
- o   Female.

2- How old are you?

3- What is your occupation?
- o   Physician.
- o   Nurse.
- o   Other. Please Specify.

4- What is your position? e.g (Managerial Position)

5-How many years of experience do you have working in Prince Sultan Medical Military City?

Training Section:

Please rate the following sentences according to the scale:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
6-I found the training sessions very useful in assisting me to understand how to use the eMedServe system.	◯	◯	◯	◯	◯
7-The training sessions were not enough. More training sessions must be conducted to assist me in understanding the system.	◯	◯	◯	◯	◯
8-I found eMedServe system very easy to use and I don't see it requires any training sessions	◯	◯	◯	◯	◯

1

9-How do you think we can improve the training sessions of eMedServe System?

_____

_____

10-Do you have any additional comments regarding the training sessions of eMedServe System?

_____

_____

Computer Skills and Knowledge section:

11-How many hours do you spend using a computer per at work (Approximate number of hours)?

[   ] Hours

12-Do you use smart phones and Personal Digital Assistants?
- o   Yes
- o   No

13-How many words can you type per minute? (Approximate number of words).

[   ] Words

Please rate the following sentences according to the scale:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
14- I have the basic skills of using a computer.	○	○	○	○	○
15-I use technology on daily basis at work.	○	○	○	○	○
16-I find advanced technology very easy to use.	○	○	○	○	○
17-Computer skills are not required to complete the daily tasks that are related to my work.	○	○	○	○	○
18-I am exposed to the use of advanced technology in everyday activity.	○	○	○	○	○
19-I find all the electronic transactions using the internet quite easy.	○	○	○	○	○

2

20-Do you think dealing with eMedServe system requires special computer skills?
- o   Yes
- o   No

If Yes Please Specify those skills

_____

_____

Productivity Section:

21- How many patients do you see or assist per day? (Approximate number).

[   ]

22-While using the eMedServe System how much time is consumed for each patient visit? (Approximate number by minutes)

[   ]

23- Do you think that the new system eMedServe has helped in increasing the productivity of the daily work? (Productivity includes but not limited to the number of patients seen per a day or the time consumed with each patient)?

- o   Yes
- o   No

  If   No please specify the reason. [   ]

24- Do you think that eMedServe increased the amount the time consumed with the patient in each patient visit?

- o   Yes
- o   No

25- Do you think that eMedServe system overcome the paper based system obstacles?

- o   Yes
- o   No
- o   If No please specify the reason. [   ]

Usability and satisfaction Section:

Please rate the following sentences according to the scale:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
26-There are some parts of the system I am still not aware of.	○	○	○	○	○
27-I can easily do orders through the eMedServe system. e.g (lab, X-ray and medications).	○	○	○	○	○

3

Please rate the following sentences according to the scale:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
28-The eMedServe system is very complicated and I still do not know how to use it	○	○	○	○	○
29-I am very satisfied with the new system.	○	○	○	○	○
30-The eMedServe system made my work much easier.	○	○	○	○	○
31-Overall, I find eMedServe system is very useful in increasing the productivity.	○	○	○	○	○
32-Overall, I find eMedServe system helped in monitoring quality control.	○	○	○	○	○
33-I find paper-based system was very easy to use unlike eMedServe.	○	○	○	○	○
34-I was very satisfied with paper-based system.	○	○	○	○	○
35-I haven't reached a full use of eMedServe but likely I am very satisfied of the current progress of work.	○	○	○	○	○
36-I find that eMedServe system will be much better in the near future.	○	○	○	○	○
37-Many customization must be conducted to eMedServe to be useful.	○	○	○	○	○

38- Are you satisfied with eMedServe system?

o   Yes
o   No

If No. Please specify the reasons:

_____

_____

4

39- How do you think eMedServe can be improved?

_____

_____

40- Do you have any additional comments?

_____

_____

_____

Thank you for cooperation and participating.

5

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