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Hospital Staff Have Positive Attitudes towards EHR and Optimistic Expectations towards EHR Implementation: A Quantitative Survey on One Hospital in Kuwait

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ABSTRACT

Context: *Attitude and acceptance can have a decisive role in successful implementation of EHRs. Previous studies of EHR acceptance were either limited to a single user group or had a small sample and a specific context.*

Aims: *To understand the attitudes towards EHR and factors influencing its acceptance by staff members in Hospital A in Kuwait.*

Settings and Design: *The data was collected in a Hospital A in Kuwait using the quantitative survey design.*

Methods and Material: *A survey was distributed to doctors, nurses, administrators and technicians. The 263 questionnaires that were returned (33% response rate) were analysed using descriptive statistics. The first section of the questionnaire contained nominal variables; the remaining data consisted of measures obtained via Likert-type scales treated as ordinal variables and described via the use of medians and modes. Modes were used as measures of central tendency.*

Results: *The staff of Hospital A had positive attitudes towards EHR and optimistic expectations towards EHR implementation. Attitudes towards EHR were influenced by organizational factors, as well as legal and ethical challenges. The majority of participants felt ready for the changes associated with EHR implementation and perceived the system as useful and believed they could harness the new technology.*

Conclusion: *The study promotes understanding of staff acceptance of EHR in the context of Kuwait, as well as in the universal context. Our findings can be used to inform the government, policy makers and hospital management on best practices of EHR implementation.*

Keywords

EHR, Electronic health records, Attitudes, Acceptance, Kuwait.

Introduction

Implementation of Electronic Health Records (EHRs) is seen as a crucial step towards a better quality of health care.[1-2] EHRs are believed to improve hospital efficiency and data sharing, provide a better understanding of diseases, and facilitate decision making and patient care [1-3].

Whereas EHR systems have been widely implemented in most of the developed and some of the developing countries, Kuwait is still at the beginning of the EHR implementation journey.[4] Since the Kuwait Development Plan sets out that all hospitals in the country have to be equipped with EHR in due course, it is important to investigate means to successful implementation and use of the system.

Previous research has pointed out that attitudes and acceptance can have a decisive role in successful implementation of EHRs [4-9]. Understanding of attitudes that users hold towards technology, innovation and change can help explain what prevents people from

successfully using a new system [8,10]. The need to study users' attitudes becomes even more pronounced considering that staff resistance has been named one of the major reasons for failure or just partial success of EHR implementation [11,12].

Previous studies of EHR acceptance were either limited to a single user group (e.g. physicians) [13], or had a small sample and a specific context [14], which prevents generalisation. Furthermore, most studies have been conducted in developed countries, the USA and Canada in particular, less being known about other national contexts.

This study aims to understand the attitudes towards EHR and factors influencing its acceptance by staff members in Hospital A in Kuwait. Knowledge of the current attitudes towards EHRs and the associated factors can help to promote successful implementation of ERPs in Kuwait.

Materials and Methods

Study Design

This research is a quantitative and descriptive study. The data was collected in a Hospital A in Kuwait using the quantitative survey design, which allowed having a larger sample.[15] Although quantitative survey methods can be lacking in depth and richness compared to qualitative methods, they can provide more comparable and generalizable data.[16] In terms of this study, using the quantitative survey design allowed analyzing the findings against previous studies that mostly have a similar framework.

Theoretical Framework

A Technology Acceptance Model (TAM) [10] is used as a conceptual framework for the study. The TAM assumes that a person who adopts a new system, as well as the context and the individual perception of the change, will influence the success or failure of the adoption process [17,18]. Reviews of the TAM concluded that it is a useful framework to predict usage attitudes [13]. Furthermore, the model has been tested and applied in many different contexts [19,20]. Thus, this study measured TAM constructs such as perceived ease of use and perceived usefulness, which might predict technology acceptance.

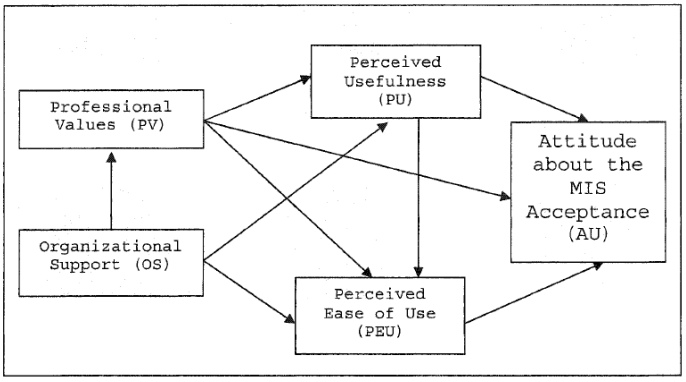

Figure 1: TAM framework [21].

The Questionnaire

This study used a survey that has already been tested for validity and reliability (Cronbach's alpha > 0.90) [21]. The questionnaire has an appropriate scope, length and tone of questions minimizing respondent bias and enhancing reliability. The questionnaire was piloted before being used for the study. The questionnaire contains the following sections: general information, management support, staff involvement, training, staff autonomy, patient relationship, perceived ease of use, perceived usefulness, EHR usage attitude, and an additional section for comments from the participants. Each variable was measured by multiple survey items, which used a five-point Likert Scale ranging from 'strongly agree' to 'strongly disagree'.

Participants

The sample was a convenience sample of 263 members of a staff of Hospital A in Kuwait. Participant were recruited via email. Prior to recruitment, the Hospital management informed doctors, nurses, administrators and technicians about the purpose and design of the study and, thus, provided the records and emails of those willing to take part in a study to the researcher. One week after the first email, a reminder was sent to further encourage participation, which is best practice applicable to surveys of health service staff and patients [22,23]. Participants were informed to contact the researcher for any questions during the study. Overall, 758 surveys were distributed to staff members and 263 surveys were returned, which makes a response rate of 34.6%.

The Hospital A in Kuwait was chosen as a good example of a hospital undergoing organizational change to implement EHRs. Its services range from acute to primary, secondary and tertiary care. The hospital has 1,437 members of staff, 758 of whom will potentially frequently use the EHR system in the future. It is a typical hospital in relation to the available services and treatments and the organizational structure. The workforce is considered to be carefully selected and possibly younger and better educated than in other hospitals.

Ethics

A participant information sheet/cover letter informed the participants about the purpose of the study and explained how their participation would help achieve the study's goals. Participants were informed that their participation was voluntary, and that they could refuse to take part in the study any time without any consequences. The risk for the participants was considered and ethical permission to conduct the study was obtained from the University of Swansea's research ethics committee. All the procedures were in accordance with the Helsinki Declaration of 1975, as revised in 2000.

Statistical Methods

The questionnaire was analyzed using mainly descriptive statistical methods. The first section contained nominal variables; the remaining data consisted of measures obtained via Likert-type scales treated as ordinal variables and described via the use of medians and modes. Modes were used as measures of central tendency. A mode below three was considered as a negative attitude and a mode above three – as a positive attitude.

Results

General Information

Of 263 respondents, 37.6% were technicians, 22.4% - nurses, 18.64% - doctors, and 11.84% - administrators; 9.5% held several job titles. There were almost as many participants who had never used an EHR in their work (35.7%) as those who used it frequently (31.9%). Regarding the use of personal computer (PC), many participants used PCs to check emails (26.2%), professional resources (23.2%), and patients' medical information (18.6%).

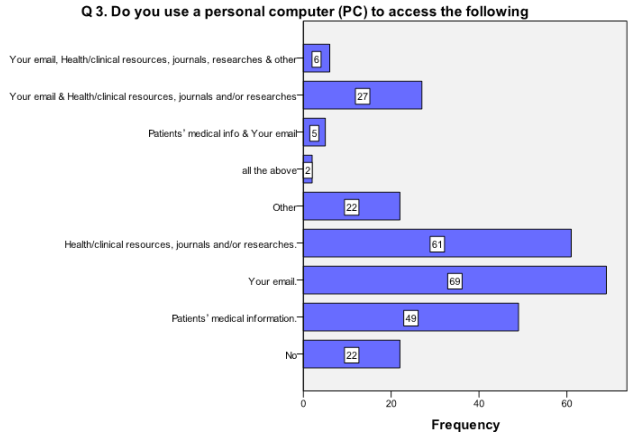

Figure 2: Reported personal computer usage.

Management Support

The staff strongly agreed (Mo=5) that EHR was important for the top management. Other six items had a mode of four (Mo=4) suggesting a lower consensus about the effective introduction and implementation of EHR by management, management's ability to involve the staff and provide training during the implementation process, the staff's ease of access to the necessary resources and the management's expectations about their use of EHR.

Staff Involvement during the Implementation Stage

The mode was four and the mean was above four for every question, suggesting that most participants agreed or strongly agreed that their personal involvement was or would be necessary, effective and useful.

Training

The respondents strongly agreed (Mo=5) that being trained in EHR would facilitate their use of the technology. Other questions exploring whether the received training was adequate, necessary for understanding of the technology and useful, had a mode of four. Among these questions, the question about the adequateness of EHR training was the one with the lowest mean (x=3.54, SD=0.96), suggesting that the training should better be improved in this regard.

Staff Autonomy

Two questions had a mode of five: whether EHR would help 1) the hospital administration and 2) the Health Ministry control and monitor clinical practices and decision-making processes of a staff. The mean and the standard-deviation was higher for the question on hospital administration (administration=4.47, SD=3.22; xMinistry=4.27, SD=0.84). This suggests that even though the majority thought that EHR would increase control and monitoring ability for both the hospital administration and the Ministry, participants agreed less about the impact of the technology upon the hospital administration than upon the Ministry.

The majority felt no concern that implementing EHR would threaten the staff's personal and professional privacy, result in legal and ethical problems or limit the staff's decision-making autonomy.

Staff-Patient Relationship

Most participants thought that the EHR would not affect the staff's credibility with their patients or the effectiveness of the staff-patient interaction. They also believed that the EHR would not affect patients' confidence in the staff and their satisfaction with the provided service.

Perceived Ease of Use of EHR

The staff expected that EHR would be easy to learn and to use. Some had already had positive and user-friendly experiences with EHRs.

Perceived Usefulness

The participants strongly agreed (Mo=5) that the EHR would allow them to monitor their schedule better and be more productive. They also strongly agreed (Mo=5) that EHR was a useful tool for their profession.

		The EHR project is important to the top management.	The EHR project will be or has been introduced to me effectively by the management.	Management will do or has done an effective job during the implementation of the EHR.	Management will involve or has involved me in the implementation of the EHR.	Management will provide or has provided me with the training that I need in order to use the EHR effectively.	I will or do have easy access to resources to help me in understanding and using the EHR.	Management expects me to use the EHR.
N	Valid	261	259	259	258	258	260	258
	Missing	2	4	4	5	5	3	5
Mean		4.4330	3.8996	3.9768	3.5814	3.8062	3.8923	3.8643
Median		5.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Mode		5.00	4.00	4.00	4.00	4.00	4.00	4.00
Std. Deviation		.80879	1.09861	1.02651	1.09968	1.02936	.88091	.92575
Sum		1157.00	1010.00	1030.00	924.00	982.00	1012.00	997.00

Table 1: Staff perceptions of management support.

		The training I receive(d) on the EHR will be or was adequate.	I will receive or have received the training that I need to be able to understand and use the EHR.	The EHR training will make it more useful to me.	The EHR training will make it easier for me to use this technology.
N	Valid	257	258	257	257
	Missing	6	5	6	6
Mean		3.5370	3.7209	4.3074	4.3580
Median		4.0000	4.0000	4.0000	4.0000
Mode		4.00	4.00	4.00	5.00
Std. Deviation		.95586	.96214	.67522	.69334
Sum		909.00	960.00	1107.00	1120.00

Table 2: Staff perceptions of EHR training.

		Using the EHR will increase the hospital administration's ability to control and monitor the staff's clinical practices and decision-making.	Using the EHR will increase the Health Ministry's ability to control and monitor the staff's clinical practices and decision-making.	Using the EHR may threaten the staff's personal and professional privacy.	Using the EHR may result in legal and ethical problems for the staff.	Using the EHR may limit the staff's autonomy in making clinical decisions or judgements.	Overall, the staff's attitude about using the EHR may be negatively affected as a result of the increased control and monitoring of their clinical practices and decision-making.	Overall, the staff's attitude about using EHR may be negatively affected as a result of the security, legal and/or ethical concerns associated with using the EHR.
N	Valid	260	260	260	256	257	255	254
	Missing	3	3	3	7	6	8	9
Mean		4.4731	4.2654	2.6962	2.6836	3.0467	2.8118	2.7835
Median		5.0000	4.0000	3.0000	3.0000	3.0000	3.0000	3.0000
Mode		5.00	5.00	2.00	3.00	2.00	2.00	2.00
Std. Deviation		3.21844	.84444	1.31078	1.24203	3.38854	1.14837	1.11598
Sum		1163.00	1109.00	701.00	687.00	783.00	717.00	707.00

Table 3: Staff perceptions of staff autonomy in case of EHR implementation.

		The development and implementation of the EHR technology will support the staff in providing better patient care.	I will encourage the use of EHR among my colleagues.	I need the EHR technology to provide effective patient care.	I am not satisfied with using the paper-based patient record in my job.	All staff should learn to use the EHR effectively.	Overall, my attitude about the EHR usage will be or has been positive.
N	Valid	260	260	258	257	258	259
	Missing	3	3	5	6	5	4
Mean		4.2577	4.2769	4.1628	3.9922	4.4186	4.3822
Median		4.0000	4.0000	4.0000	4.0000	5.0000	5.0000
Mode		4.00	4.00	4.00	5.00	5.00	5.00
Std. Deviation		.72924	.75096	.78696	1.04205	.70791	.75009
Sum		1107.00	1112.00	1074.00	1026.00	1140.00	1135.00

Table 4: EHR usage attitudes.

Attitudes towards the EHR

Most participants strongly agreed (Mo=5) that paper-based patient records were unsatisfactory and that it was necessary to teach EHR to all the staff. The participants held very positive attitudes towards the EHR (Mo=5). They also mostly agreed (Mo=4) that development and implementation of EHR technology would benefit patient care provision, that EHR was necessary for improving patient care provision effectiveness, and that they would encourage their colleagues to use it.

Discussion

The study shows that the staff of Hospital A has positive attitudes towards EHR and optimistic expectations towards EHR implementation. Attitudes towards EHR were influenced by organizational factors, as well as legal and ethical challenges. The majority of participants felt ready for the changes associated with EHR implementation. They perceived the system as useful and believed they could harness the new technology.

Our findings are in line with the existing evidence suggesting that if the staff perceive EHR as easy to use, they have more positive attitudes towards the system [24]. Positive attitudes can be partially explained by familiarity of the staff with computer use, since a large proportion of the sample had some experience with a computer and some had used EHRs before [25]. Another potential reason underlying the optimistic outlook could be the staff's confidence in the adequateness of training they would receive

[26]. At the same time, the study showed that the participants did not expect negative outcomes in relation to the quality of care and staff-patient relationship, which corroborates findings of other research groups [27,28].

Another finding of the study is that participants disagreed most on the statements regarding legal, ethical and security issues while considering them important factors affecting attitudes towards EHR. The lack of consensus in these sections of the questionnaire can be explained by the findings of previous studies showing that ethical and legal issues can leads to resistance towards HER [7].

Limitations

One limitation of this study is the choice of a convenience sample as a sampling strategy. Although the choice of the sampling strategy may be explained by many practical reasons, such as limited time and access to different populations, it could lead to sampling bias. For instance, the staff members who were interested in receiving and promoting EHR could be more likely to fill in the survey and more likely to give positive answers. Further research with a differently selected population would be necessary to exclude such kind of sampling bias.

Due to limitations in a sample size, it was not possible to compare responses and attitudes of different staff groups. Studies focused on different staff groups and interaction between them during EHR implementation would help understand the whole process better, as previous research has shown that there are differences between various staff groups when it comes to technology acceptance [1,29].

Future Research Directions

The study would benefit from a comparative perspective: comparison of two or more instances of attitudes towards EHR in various hospitals in Kuwait can give valuable insight about the factors affecting EHR acceptance and use. Another direction for future research can be comparison of the attitudes of the staff toward EHR before the implementation, soon after the implementation and several years after the implementation. Such longitudinal studies would allow to assess how pre-implementation attitudes predict success of implementation and usage attitudes [24]. Furthermore, such design could show how EHR attitudes change over time [30].

Conclusion

Overall, this study contributes to the understanding of staff attitudes towards EHR and maps out possible barriers to successful EHR implementation. Participants to the study had rather positive attitudes towards EHRs and were also familiar with the use of technology. Wider implications of these and other findings are that hospitals need to hire staff with prior computer knowledge, provide adequate training procedures and actively involve future users to facilitate EHR implementation.

The wider benefit of this study is that it promotes understanding of staff acceptance of EHR in the context of Kuwait, as well as in the universal context. It shows that the TAM is a useful predictor of usage attitudes. A practical implication of this study is that it can inform the government, policy makers and hospital management on best practices of EHR implementation. In particular, the study highlights the importance of attention to security, ethical, and legal concerns and development of adequate training programs for the successful implementation of EHRs.

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