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ON

**Technology Acceptance Model: An Empirical Study of Electronic
Health Record among Health workers in Ahmadu Bello University
Teaching Hospital, Shika-Zaria, Kaduna State, Nigeria.**

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Abstract

In Nigeria, patients spend ample time at the clinics waiting to be attended to by healthcare providers and other clerical staff. A lot of reasons have been associated with the causes of the long waiting period at the outpatient department in most clinics in developing countries among which is the issue of manual record keeping. Different pragmatic approaches have been made in other to reduce the waiting period at the clinics among which is EHR. For EHR to be fully utilized there be some perceived benefits on the part of the users. The study used Davies (1989) technology acceptance model (TAM) to explain the user (health workers) acceptance behavior of EHR in Ahmadu Bello University Teaching Hospital (ABUTH), Shika-Zaria. Two research questions was raised, the study adopted qualitative methodology. The population of the study included all the health workers in ABUTH using a clustered sampling technique to randomly select the respondents and the process of interviewing was stopped the data reached the saturation stage. Content analysis of data was used to the data. It was discovered that if the technology is established, it will assist the management in there planning in terms of recruitment of personals and the use of facility within certain unit in the hospital this will lessen the time patients wait at the clinic. It can be concluded that if EHR is adopted in the system, there is the possibility that the technology may be fully utilized because of the inherent perceived ease of use and usefulness as observed by the health workers there by reducing the time patient spent at the public health facility.

Keywords: Technology Acceptance, Electronic Health Record, Perceived usefulness, Perceive ease of use, Acceptance behaviour

Introduction

In Nigeria, patients spend ample time at the clinics waiting to be attended to by healthcare providers and other clerical staff. However, the standard waiting period by the Institute of Medicine (IOM), as stipulated by O'Malley, Fletcher, & Earp (1983) is for 90% of patients to be attended to by the healthcare providers within their first 30mins at the hospital. In developing countries, the reverse is the case especially at the outpatient department of most public health facilities where patients spent 1-2 hours at the reception waiting for their cards to be called (Singh & Mustapha, 1999; Ofilli & Ofowve, 2005 & Ofilli & Ofowv, 2007). After calling their names, they will now join the queue of those to see the doctor.

A lot of reasons have been associated with the causes of the long waiting period at the outpatient department in most clinics in developing countries (Cayirli & Veral, 2003; Hoot & Aronsky, 2008; Zhenzhen & Calvin, 2017). Among which is the issue of the manual way record-keeping (Owoseye, 2018) which has a significant effect on the time spent in the process of retrieving the

same patient health record. In addition, there is the possibility of missing patient files and or misplacement of the test result.

Different pragmatic approaches have been made in other to reduce the waiting period at the clinics (Zimmerman, 2016; Heath, 2018; MedPro Disposal; 2018), yet the problem remains unabated especially in developing countries. Lee (n.d) proposed the use of Electronic Health Record (EHR) which to him will address the issue of the manual record-keeping system and element unnecessary time waiting. EHR is an electronic or digital version of patient health history created by an eligible person mostly available online which can be accessed only by an authorized person (Creswell & Sheikh, 2017; Healthcare Information and Management Systems Society, 2019).

For such technology as EHR to be fully utilized to achieve its objectives, there must be some kind of perceived benefits on the part of the users. The aim of this study is to use Davies (1989) technology acceptance model (TAM) to explain the user (health workers) acceptance behavior of EHR in Ahmadu Bello University Teaching Hospital (ABUTH), Shika-Zaria.

Literature Review

One of the models used to explain users' acceptance behaviour is the Technology Acceptance Model (TAM) introduced by Davies in 1986. The model is rooted in social psychology theory and the Theory of Reasoned Action (TRA) pioneered by Fishbein and Ajzen, 1975. TRA avers that beliefs control attitudes, which lead to intention and thereby spawn behaviour. Davies (1986 and 1989) four constructs of TAM include perceived ease of use, perceived usefulness, attitude and behavioural intention to use.

Over the decade, many scholars have used TAM in the research with various user groups, sample size and different statistical tool to analysis within and across an organization (Gefen, 2000; Ma & Liu, 2014). TAM had also been applied to diverse end-user technologies such as e-mail (Adams, Nelson & Todd, 1992; Davies, Bagozzi & Warshaw, 1989), groupware (Taylor & Todd, 1995), spreadsheets (Agarwal, Sambamurthy & Stair, 2000; Maithieson, 1991), and World Wide Web (Lederer, Maupin, Sena & Zhuang, 2000). Researchers suggested that TAM is compelling, cost-conscious, and strong (Venkatesh & Davies, 2000)

Methodology

A qualitative methodology was used in this study to examine the technology acceptance of EHR among health workers in Ahmadu Bello University Teaching Hospital, Shika-Zaria. Davies (1989) Technology Acceptance Model is ideally useful for a holistic and contextual study like this.

Research Questions

Two research questions, based on Davies analytical components guided this study:

- 1 Perceived ease of use: How does EHR work?
- 2 Perceived usefulness: How do you think EHR can help your organization?

Population of the Study

The population of the study included all the health workers working at ABUTH, Shika-Zaria. The study used clustered and random sampling techniques to sample the needed population for the study. The researcher stopped the interviewing processes when the data reaches a saturation stage.

Data collection and analyses

Data were collected using the interview guide and tape-recorded of the responses. The interview included all the questions on the interview guide and contained open-ended questions to facilitate an in-depth elicitation of information from the selected participants. The data collected were analyzed using qualitative content analysis. In qualitative content analysis, data are analyzed based on subjective interpretation of content through the process of coding and identification of themes and pattern inherent in the collected data (Hsieh & Shannon, 2005). However, in order to ensure anonymity, data were expunged of any information that might identify a specific health worker. Findings concerning perceived ease and usefulness emerged from the data collected from this study.

Findings and Discussions

Perceived ease of Use

For an individual or group of people to migrate from one platform to another, they must believe that the new platform will offer a better service or performance to them. Davies (1989) refers to perceived ease of use as "the degree to which a person believes using a particular system would be free of effort". The selected health workers were asked if the introduction of EHR will ease their work. Presented below is the narrations from the participants

"EHR is the hmmm an alternative to manual record. Everything about the patient is there in the system, and all you have to do is enter his/her hospital number and also the name. All information about that patient will come out"

Participant II

"with the computer, is very easy to input result and easy to retrieve the result at the same time"

Participant III

" Normally, when we request for investigation of patients, the sample is sent to the lab, when the result is ready, because if you are using EHR, the whole hospital are linked up; the ward, the lab, the clinics everywhere. The engine room that is Health Information Management office

where everything is being coordinated, now, when the results are ready, it will be inputted into the system and embedded in the patient record and from where I am, I will be able to access the result using his hospital name and number.

Participant IV

“It works using computer. So records are being generated at initial visit are documented usually with a form of internet or intranet with a form of server that helps to connect all the patients’ records together so that for example, I get impinge on this patient and when I finished impinging and discharge him from my document. The next physician at a remote clinic can just connect the patient name and hospital number and access that patient’s record from a remote centre without coming to me or to pick a hard copy of folder that does not exist”

Participant V:

“those that are using EHR are enjoying it because don’t have anything to do with paper, you see everything online and do everything online. From the reception to the doctor no paper work”

Perceived usefulness

For a system such as EHR to be regarded as being useful, it has to have a better advantage over the existing manual record. Davies (1989) defined perceive usefulness as “the degree to which a person believes that using a particular system would enhance his/her job performance”. In other to elucidate this from the participant, they were asked to discuss the likely benefit they will derive if the system is fully implemented in their organization. Below are there responses.

Participant I:

“with EHR, it will turn around time getting thing done within the shortest period of time. The quality of healthcare we give to patient and how friendly our working environment is will improve. Even the PR of the hospital will improve because patients will not suffer going from one big lab to collect result before seeing doctors”

Participant II:

“... It will help the organization to plan because it will help them to know the actual number of patients that are coming in and coming out and what was done for each patient. Actually, it means you have correct data, you have limited number of missing data so the management will be able to do proper planning and then you will also able to do easier evaluation what you are doing whether is working or not... when it comes to the issue of research again, when you are looking at any record, you just input the type of maybe diseases you are at or the particular parameter you are looking at. At a glance, you have everything... ”

Participant III:

“I noticed that it is very effective because if you wrote a drug for a patient and he went to the pharmacist and there is a mistake, the pharmacist will query it. ... it guides a lot of things and prevent a lot of quacks using the hospital number or patient names to claim something”

Participant IV:

“at least it will help to reduce the time patients at the hospital and eliminate the unnecessary delay and the issue the issue of misplacement of records and files”

Participant V:

“patients will not ask us to give them their files by hand”

From the analysis on the perceived ease of use, three findings emerged that is: records are easy to retrieve, access to patient’s information is easy and up to date with a click, and errors are easily identified because patient’s information is centrally stored.

Based on the issue of perceived usefulness, the following findings also become visible these are:

Confidentiality of patient’s information because it is only those that needed the information either to treatment, monitoring of patient’s progress will have access to the information;

Assisting in the quality of healthcare that will be given to patient, where patient has being given certain medication and there is some kind on negative reaction toward such drug, there is the tendency that such medication may not be repeated or in case where the patient as allergy to some medication;

Elimination of unnecessary time that patient spent before treatment is given;

Also, it established that the technology has the capacity to assist the management in there planning in terms of recruitment of personals and the use of facility within certain unit in the hospital;

With the introduction of EHR, impersonation is easy to identify

Conclusion

It can be concluded that if EHR is adopted in the system, there is the possibility that the technology may be fully utilized because of the inherent perceived ease of use and usefulness as observed by the health workers there by reducing the time patient spent at the public health facility.

References

- Adams,D.A., Nelson, R.R. & Todd, P.A (1992). Perceived usefulness, ease of use, and usage of information. MIS Quarterly
- Agarwal,R., Sambamurthy, V. & Stair, R.M. (2000). The evolving relationship between general and specific computer self-efficacy- an empirical assessment. Information Systems Research, 1(4)
- Bengtsson, M. (2016). How to plan and perform a qualitative study using content analysis at <https://www.sciencedirect.com/science/article/pii/S2352900816000029> on 23/9/19
- Cayirli T,& Veral E. (2003). Outpatient scheduling in health care: a review of literature. Prod Oper Manag. 12(4):519-549. [[Google Scholar](#)]
- Cresswell, K.M. & Sheikh, A. (2017). Inpatient clinical information systems at <https://www.sciencedirect.com/topics/medicine-and-dentistry/electronic-health-record>
- Davies, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance. MIS Quarterly, 13(3)
- Davies, F.D. Bagozzi, R.P. & Warshaw, P.R. (1989). User acceptance of computer technology: a comparison of two. Management Science 35(8)
- Fishbein, M. & Azjen, I. (1975). Belief, attitude, intention and behavior. Reading MA: Addison-Wesley
- Gefen, D. (2000). Structural equation modeling and regression: guidelines for research practice. CAIS 4(7)
- Healthcare Information and Management Systems Society (2019). Electronic Health Records at <https://www.himss.org/library/ehr> on 18/8/19
- Heath, S. (2018). Solutions for Reducing Healthcare Appointment Wait Times for Patients at <https://patientengagementhit.com/news/solutions-for-reducing-healthcare-appointment-wait-times-for-patients> on 18/8/19
- Hoot NR, Aronsky D. (2008). Systematic review of emergency department crowding: causes, effects, and solutions. Ann Emerg Med. 52(2):126-136. [[PubMed](#)] [[Google Scholar](#)]
- Hsieh, H.F & Shannon, S.E. (2005). Three approaches to qualitative content analysis. Qualitative Health Research, 15(9)
- Lederer, A.L., Maupin,D.J, Sena, M.P. & Zhuang,Y (2000). The technology acceptance model and the world wide web. Decision Support Systems, 29(3)
- Lee, H (n.d) How to reduce hospital wait time at <https://www.qminder.com/reduce-hospital-wait-times/>
- Ma, Q. & Liu, L. (2004). The technology acceptance model: a meta-analysis of empirical findings. Journal of Organizational and Users Computing, 16(1)

- Maithieson, K., (1991). Predicting user intentions: comparing the technology acceptance model with the theory of planned behavior. *Information System Research*, 2(3)
- MedPro Disposal (2018) 15 Highly effective ways to decrease patient wait time at <https://www.medprodisposal.com/15-ways-to-decrease-patient-wait-time>
- Ofilli A.N., Ofowve C.E., (2005). Patient's assessment of efficiency of services at a teaching hospital in a developing country. *Ann Afr Med*. 4:150–3. [[Google Scholar](#)]
- Ofilli A.N., & Ofowve C.E., (2007). What patients want: A content analysis of key qualities that influence patient satisfaction. *J Med Pract Manage*. 2007;22:255–61. [[PubMed](#)] [[Google Scholar](#)]
- Owoseye, A. (2018). FEATURE: Patients lament long waiting time at Nigerian hospitals as govt. seeks solutions *PremiumTime* Monday August, 12, 2019 <https://www.premiumtimesng.com/news/headlines/258454-feature-patients-lament-long-waiting-time-nigerian-hospitals-govt-seeks-solutions.html>
- Singh H, Haqq ED, & Mustapha N., (1999). Patients' perception and satisfaction with health care professionals at primary care facilities in Trinidad and Tobago. *Bull World Health Organ*. 77:356–60. [[PMC free article](#)] [[PubMed](#)] [[Google Scholar](#)]
- Taylor, S., & Todd, P., (1995). Assessing IT usage: the role of prior experience. *MIS quarterly*, 19(4).
- Venkatesh, V. & Davies, F.D., (2000). A theoretical extension of the technology acceptance model: four longitudinal field studies. *Management Science*, 46(2)
- Zhenzhen Xie MS and Calvin OR (2017) Associations between waiting times, service times, and patient satisfaction in an endocrinology outpatient department: a time study and questionnaire survey at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5798665/> 18/8/19
- Zimmerman, B (2016) 5 ways to reduce patient wait times at <https://www.beckershospitalreview.com/patient-flow/5-ways-to-reduce-patient-wait-times.html> on 18/8/19