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The Acceptance of National Electronic Health Records in Saudi Arabia: Healthcare Consumers' Perspectives

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Completed research paper

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Abstract
This study aims to investigate factors impacting healthcare consumers' acceptance of National Electronic Health Records (NEHRs) in Saudi Arabia. The study incorporated perceived security concerns and trust factors into the Unified Theory of Acceptance and Use of Technology (UTAUT) model. A questionnaire survey was distributed among Saudi citizens to gain their perceptions, and 794 valid responses were collected. Structural Equation Modeling (SEM) was used to analyse the collected data. Both the measurement model and structural model proved a good fit to the research data. All research hypotheses were supported at the significance level of $p < 0.001$ except the impact of social influence, which was significant at the level of $p < 0.005$. The proposed model explained 56% of the variance in behavioural intention, implying the presence of additional factors that are not yet identified. A better understanding of these influential factors could prompt policymakers to effectively plan for and enhance the acceptance and use of NEHRs.

Keywords national electronic health records, integrated electronic personal health records, technology acceptance, behavioural intention, unified theory of acceptance and use of technology.

1 Introduction

Within the healthcare field, National Electronic Health Records (NEHR), or Integrated Electronic Personal Health Records (Integrated ePHRs), have gained growing attention in recent years (Abd-Alrazaq et al. 2019; Fragidis and Chatzoglou 2018). The NEHR is defined as a nationally implemented, interoperable health information system that enables the exchange of health-related information between different EHR systems, operating within different health facilities, through nationally agreed on interoperable standards (Morrison et al. 2011).

Globally, the NEHR system has been viewed as key to empowering the national availability of health-related information in a secure, structured, and standardised way. The national implementation of an EHR system has proved to be potentially beneficial, not only to healthcare consumers and health professionals, but also to the government, by encouraging healthcare consumers to manage their health, supporting easy and timely access to patient information, and reducing the cost of medical care (Tang et al. 2006). Examples of NEHR systems implemented worldwide include, 'My Health Record' in Australia (Kasteren et al. 2017), 'Patient Online' in England (Abd-Alrazaq et al. 2019), and the 'NEHR' in Denmark (Fragidis and Chatzoglou 2018).

Despite the promising advantages of the NEHR systems, their acceptance and adoption remain low worldwide (Abd-Alrazaq et al. 2019; Kasteren et al. 2017). In this sense, the implementation process of the NEHR system has been highlighted as being as critical as the system itself, given that the worldwide implementation of NEHR systems has proceeded more slowly than was initially projected (Morrison et al. 2011). The causes behind this are attributed to several factors, such as the constant evolution in system features, lack of interoperability, political interference impacting interactions between healthcare providers, and users' acceptance (Morrison et al. 2011). In a review of several implementations of NEHRs within 13 countries, Fragidis and Chatzoglou (2018) indicated users' acceptance as a significant obstacle delaying the NEHRs implementation process. For example, Australia's 'My Health Record' was introduced in 2012 and aimed to enhance health-related information availability to both healthcare providers and patients. However, slow uptake and low awareness among Australians were found as hindrances to achieving advanced progress in its implementation (Kasteren et al. 2017). Similarly, in England, healthcare consumers' adoption of "Patient Online" was reported as only 24.4% in 2018 (Abd-Alrazaq et al. 2019).

The implementation of nationwide EHRs is limited in developing countries where the majority of related applications are simple patient portals provided at an institutional or single health unit level (Gheorghiu and Hagens 2017; Tavares and Oliveira 2018). Studies have shown that the use of these portals was deficient, less than 11% of the overall annual targeted population (Gheorghiu and Hagens 2017).

Saudi Arabia is facing increasing demand on essential services and facilities, including healthcare services, as a result of unprecedented growth in the population. The population is currently increasing by 2.54% per annum (Ministry of Health 2018a) and is expected to reach 39.8 million by 2025 (United Nations 2015). Currently, the Ministry of Health (MOH) is working on the implementation of a highly ambitious project in order to accomplish its vision of a "safe, efficient health system, based on care centered on a patient, standard-oriented, and supported by e-health" (Ministry of Health 2018c). The MOH aims to develop a national EHR system called "unified EHRs" through the development of standardised medical terminologies and electronic communication channels through various EHR systems (Ministry of Health 2018b). The system, NEHR, will also enable the MOH to undertake data mining, knowledge management, and research analytics. The proposed NEHR system will include administrative and demographic data, health history, clinical documentation, test reports, progress notes, medications, problems, images and reports, discharge summaries, allergies, and immunisations.

Most relevant studies in the Saudi context have focused on health professionals' perspectives or technical aspects of these technologies, without considering healthcare consumers' perspectives (Alsulame et al. 2016; Jabali 2017). Given the sensitivity of health-related information and the complex nature of NEHR, assessing public perceptions is essential during the pre-implementation phase. Additionally, the actual use of new technology is often predicted by potential users' behavioural intention towards its use (Venkatesh et al. 2003). Understanding factors that facilitate or hinder the acceptance and use of the NEHR system is imperative and timely as it will help the government and policymakers in the MOH to modify the design and regulate the use and exchange of health-related information. However, key predictors of NEHRs' acceptance and usage are still unclear in developing countries and Saudi Arabia in particular.

1.1 Objective

The purpose of this study is to assess a model examining predictors of Saudi healthcare consumers' intention to accept and use the NEHR system in Saudi Arabia. In particular, this study modified and extended the Unified Theory of Acceptance and Use of Technology (UTAUT) by incorporating trust and perceived security concern to predict influential factors and assess their strength on impacting healthcare consumers' acceptance of the NEHR system in Saudi Arabia.

2 The Unified Theory of Acceptance and Use of Technology

The Unified Theory of Acceptance and Use of Technology (UTAUT) was developed by Venkatesh et al. (2003), aiming to provide a comprehensive model that provide a better explanation of factors driving or hindering technology adoption in an organisational setting. After a thorough review of eight adoption models, the UTAUT was advanced to provide a powerful model by integrating constructs from these models. Venkatesh et al. (2003) analysed these models based on conceptual and empirical similarities and formed a unified model, UTAUT. The UTAUT has four direct determinants of usage and behaviour intention: Performance expectancy, effort expectancy, social influence, and facilitating condition. Table 1 presents definitions of these constructs, as stated by Venkatesh et al. (2003, pp. 447-453).

Construct	Definition
Performance expectancy	"is the degree to which an individual believes that using the system will help him or her to attain gains in job performance."
Effort expectancy	"is the degree of ease associated with use of the system."
Social influence	"is the degree to which an individual perceives that [it is] important others believe he or she should use the new system."
Facilitating condition	"is the degree to which an individual believes that an organisational and technical infrastructure exists to support use of the system."

Table 1. Definitions of The UTAUT Core Constructs

The model hypothesises that three core variables, namely performance expectancy, effort expectancy, and social influence predict behavioural intention, while facilitated condition and behavioural intention are direct predictors of usage behaviour. Additionally, the UTAUT has four moderators, namely gender, age, experience, and voluntariness of use.

3 Research Model and Hypotheses Development

This study adopted the UTAUT as a theoretical lens to investigate key predictors of the acceptance of NEHR in Saudi Arabia. However, considering the context of this study it was necessary to modify and extend the original model. Such modifications are evident in the literature and suggested by Venkatesh et al. (2003) and Venkatesh et al. (2012). Accordingly, this study modified the UTAUT model; first by adding two constructs, trust (TR) and perceived security concern (PSC). Secondly, in line with other studies (Iqbal and Qureshi 2012; Slade et al. 2015) in which the technologies under investigation were in the pre-implemented phase, this study excluded the UTAUT's "use behaviour" construct because the target population in this study were potential users of the NEHR system. Thus, the "use behaviour" construct was not measurable. Additionally, since the original model proposes that the fourth construct in the model 'facilitating condition' has a direct effect on "usage behaviour", the 'facilitating condition' construct was also removed from the research model. Thirdly, the moderator 'experience' in Venkatesh et al. (2003) model was modified to Internet experience. Several studies have reported the moderation impact of Internet experience on people's intention to use a specific e-system (Hamid et al. 2016). Finally, the moderator "voluntariness of use" was excluded because the study population was not mandated to use the NEHR system. The following Figure 1 presents the research model.

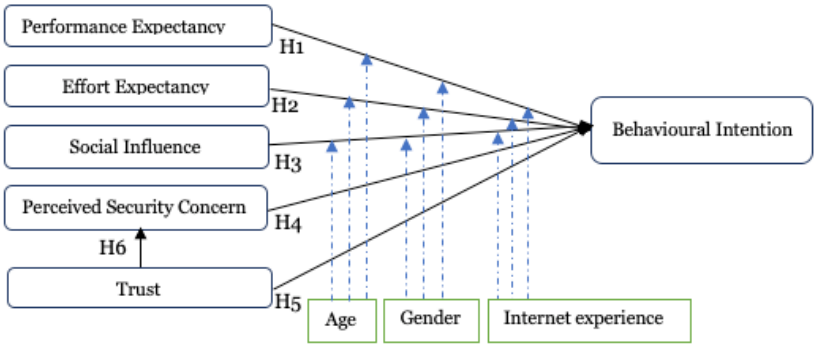

Figure 1. Research model

Performance expectancy (PE) in the consumer context is defined as "the degree to which using a technology will provide benefits to consumers in performing certain activities" (Venkatesh et al. 2012, p. 159). In the original UTAUT model, PE had the highest significant impact on behavioural intention (Venkatesh et al. 2003). Additionally, several e-health studies have supported the impact of PE on behavioural intention (Abd-Alrazaq et al. 2019; Garavand et al. 2016). One of the most promising features of NEHR is easy and timely access to health-related information whenever a need arises. As the NEHR enables individuals to view and access their health-related information, it offers them utilitarian advantages, which are expected to act as a driver for the acceptance and use of the NEHR system. Consequently, it was hypothesised that:

H1: PE positively influences behavioural intention to use the NEHR system

Effort expectancy (EE) in the consumer context is defined as "the degree of ease associated with consumers' use of technology" (Venkatesh et al. 2012, p. 159). EE has been reported as a significant predictor of behavioural intention in the e-health context. For example, Abd-Alrazaq et al. (2019) found EE to have a significant impact on behavioural intention to use "Patient Online". Similarly, other studies confirmed the influence of EE on users' intention to accept and use health technologies (Bawack and Kamdjoug 2018; Quaosar et al. 2017). Therefore, we hypothesised that:

H2: EE positively influences behavioural intention to use the NEHR system

Social influence (SI) in the consumer context is defined as "the extent to which consumers perceive that important others believe they should use a particular technology" (Venkatesh et al. 2012, p. 159). SI measures the degree to which a person values the perceptions of relatives and groups and whether these external perceptions influence his or her decision towards accepting a technology. Although Abd-Alrazaq et al. (2019) found an insignificant impact of SI on people's intention to use "Patient Online" in England, other studies confirmed the significant impact of SI on individuals' intention to use health technologies (Ozok et al. 2017; Quaosar et al. 2017). In middle eastern countries, like Saudi Arabia, people often tend to be more connected with each other and are distinguished by their collectivist culture. Thus, SI may impact the formation of their decision when presented with new technology. Hence, we proposed the following hypothesis:

H3: SI positively influences behavioural intention to use the NEHR system

Perceived security concern (PSC) is the degree to which an individual believes that using a particular technology is secure (Li and Slee 2014). In e-health, security is the measurement and mechanism applied for the protection of the privacy and confidentiality of individuals' health-related information. Due to the sensitivity of health information, the security of an e-health system is among the most critical factors that determine healthcare consumers' adoption of e-health tools (Li and Slee 2014). For example, Wilkowska and Ziefle (2012) conducted an empirical study in Germany to examine users' acceptance of e-health services. They highlighted the significance of security aspects in playing an integral role in the acceptance and use of e-health tools. Similarly, healthcare consumers' concerns about the security of e-health tools were also evident in several other studies (Alloghani et al. 2015; Luque et al. 2013). This study integrated PSC to the modified UTAUT model and hypothesised that:

H4: PSC negatively influences behavioural intention to use the NEHR system

Trust (TR) is defined as an individual's willingness to rely on another person in whom he/she has confidence (Jones et al. 2012). TR becomes essential for individuals in the virtual world, where the absence of the physical aspect and clarity of the tangible are evident. In the context of this research, TR is the degree to which healthcare consumers believe that the NEHR system is reliable and all parties involved in accessing the NEHR system and its content are trustworthy and will act in the healthcare consumers' best interest. TR is even more critical in the context of e-health due to the characteristics of

uncertainty within the healthcare setting and the component of risk concerning the proficiency and intentions of the physicians on whom the patient is reliant (Alaszewski 2003). For example, Briggs et al. (2002) found that participants were more willing to trust e-health websites if the observed risk was low. Additionally, in a developing country, Pakistan, Kamal et al. (2020) reported TR as one of the main drivers of telemedicine acceptance and use. Moreover, TR can have a role in reducing security concerns. When people have a high degree of trust in a technology provider or the technology itself, they will more easily overcome the uncertainty of the behaviour and its probable consequences (Cripps and Standing 2012). Accordingly, this study incorporated TR and proposed that:

H5: TR positively influences behavioural intention to use the NEHR system
H6: TR negatively influences PSC of the NEHR system

The moderation hypotheses have not been reported in this paper due to the brevity of the paper.

4 Methods

4.1 Measurements

All the items used to measure the impact of the research model constructs in this study were adopted from validated items obtained from prior studies with a minor adaptation to adjust to context of the study (e.g., (Chandra et al. 2010; Ozok et al. 2017; Venkatesh et al. 2003; Venkatesh et al. 2012). The questionnaire was translated by a certified translator to Arabic, as Arabic is the mother tongue of the target population. Additionally, a back-translation technique was performed to ensure the quality of the translation in delivering the original meaning (Brislin 1970). A 5-point Likert scale was used to measure the scales' items, ranging from "Strongly disagree (1)" to "Strongly agree (5)". Other questions about participants' demographic information were also included.

4.2 Data Collection

The target population was Saudi citizens aged 18 years old and above. Data collection was performed between July and October 2019 in Saudi Arabia. A pilot study was conducted with 30 participants to ensure the reliability of the questionnaire items, and no issues were noted concerning the reliability of the survey items.

Data were collected using both web-based and paper-based surveys. The web-based survey was chosen because it enables a broader distribution and facilitates reaching participants regardless of their location of residence in Saudi Arabia. It was distributed publicly through social media networks and other online group sites to ensure diversity of participants. The use of social media networks, such as WhatsApp, Twitter, Facebook, and Snapchat, to distribute the survey was selected due to the high usage rate, over 18 Million users, of social network applications in Saudi Arabia, enabling broader distribution of the survey. For example, the use of Snapchat in Saudi Arabia was ranked as the highest among Arab countries and second worldwide (Ministry of Communications and Information Technolgy 2019). The paper-based survey was distributed in public places in the three most prominent cities in Saudi Arabia, Riyadh, Jeddah, and Dammam.

Before the survey, we provided the participants with an introduction to the purpose of the study and the concept of the NEHR system as reported by the MOH in Saudi Arabia to make sure participants were aware of the system under investigation. The minimum required sample size was calculated based on the widely reported rule of thumb for Structural Equation Modeling (SEM) of 10 times the number of indicators (measures) in the research model (Hair et al. 2010). Our survey had 23 items, so the minimum required number of participants was 230. The Ethics Committee approved the study at the University of Technology, Sydney.

4.3 Data Analysis

Firstly, data screening was performed to prepare the raw data and ensure the accuracy of the data. All non-Saudi participants were excluded because they were out of the study's scope. The remaining responses were screened for missing values; unengaged response; outliers; and normality. Secondly, participants' demographic characteristics were analysed by descriptive statistics using the Statistical Package for the Social Sciences (SPSS). Thirdly, AMOS software was used to test the research model. Within AMOS software, we conducted confirmatory factor analysis (CFA) to assess the composite reliability and validity, including discriminant and convergent validity of the constructs' measures.

Following that, Structural Equation Modeling (SEM) was performed to test the proposed hypotheses within the modified UTAUT model. SEM is a second-generation multivariate analysis technique

developed to overcome some limitations in first-generation techniques such as multiple regression and logistic regression (Hair et al. 2010). Hair et al. (2010) explained SEM as a two-step approach, which is a combination of CFA (i.e., measurement model) and path analysis (i.e., structural model). CFA was conducted to assess the measurement model by using AMOS software. This was followed by path analysis of the structural model. The measurement model was verified by assessing the composite reliability, convergent and discriminant validity, and the overall model fit. Construct reliability is often assessed through Cronbach's alpha, where a value of greater or equal to 0.70 demonstrates sufficient internal consistency of a construct's measures (Hair et al. 2006). Convergent validity is measured based on recommended values of average variance extracted (AVE) (0.50 or more), factor loading (>0.30, where more than 0.70 is deemed high), and composite reliability (0.70 or more) (Hair et al. 2010; Tabachnick and Fidell 2007). Discriminate validity is deemed acceptable if the value of the square root of the AVE of each construct is higher than its correlation coefficients with the rest of the constructs in the model (Hair et al. 2010; Tabachnick and Fidell 2007). Finally, the AMOS software generates various indices of the goodness of fit that show how well the proposed model fits the research data. In this study, we used several fit indices to evaluate our proposed model goodness-of-fit, which included Root Mean Square of Error Approximation (RMSEA), Goodness of Fit Index (GFI), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Incremental-fit index (IFI), as suggested in related literature (Brown 2014; Hair et al. 2010; Kline 2005).

5 Results

A total of 794 valid responses were obtained and included in the analysis. Table 2 shows the respondents' demographic information.

Variable		Respondents, n (%)
Gender	Male	482 (60.7)
	Female	312 (39.3)
Age (years)	18 - 24	96 (12.1)
	25 - 34	348 (43.8)
	35 - 45	246 (31.0)
	46 - 59	96 (12.1)
	60 and above	8 (1.0)
Education	High school or lower	81 (10.2)
	Diploma	64 (8.1)
	Bachelor	417 (52.5)
	Post-graduate degree	232 (29.2)
Internet Knowledge	Very poor	1 (0.1)
	Poor	7 (0.9)
	Moderate	242 (30.5)
	Good	491 (61.8)
	Very good	53 (6.7)

Table 2. Demographic Characteristics

5.1 Measurement Model Assessment

The results of the measurement model assessment are presented in Table 3 and Table 4. The values of the factor loading, composite reliability, and the AVE of each construct in the model are above the recommended values, showing good reliability and convergent validity. The factor loading values of the constructs' indicators ranged from 0.71 to 0.85, proving sufficient loadings. Also, the square root of the AVE of each construct is greater than its correlation coefficients with the rest of the constructs, signifying sufficient discriminate validity. Finally, Table 5 shows that the proposed measurement model proved a good level of goodness-of-fit.

Construct	Cronbach's Alpha	Composite Reliability	Average Variance Extracted
PE	0.86	0.87	0.62
EE	0.84	0.84	0.57
SI	0.83	0.84	0.57
PSC	0.90	0.90	0.69
TR	0.86	0.86	0.60
BI	0.81	0.81	0.59

Table 3. Results of Constructs' Convergent Validity

Construct	PE	EE	PSC	SI	TR	BI
PE	0.793					
EE	0.410	0.759				
PSC	-0.110	-0.299	0.835			
SI	0.135	0.414	-0.304	0.756		
TR	0.204	0.565	-0.371	0.411	0.779	
BI	0.436	0.635	-0.449	0.420	0.576	0.774

Table 4. Results of Constructs' Discriminant Validity

Fit Index	Recommended Value	Research Model	Comments
x^2/ df	<5.0	2.08	The required level is achieved
GFI	>0.90	0.93	The required level is achieved
CFI	>0.90	0.96	The required level is achieved
IFI	>0.90	0.96	The required level is achieved
TLI	>0.90	0.96	The required level is achieved
RMSEA	<0.08	.03	The required level is achieved

Table 5. Goodness-of-Fit Indices of The Research Measurement Model

5.2 Structural Model Assessment

Goodness-of-fit indices' values of the structural model were also good indicating that the hypothesised structural model achieves a good fit to the research data (Chisq/*df* = 2.12, GFI = 0.93, TLI = 0.95, CFI = 0.96, IFI = 0.96, and RMSEA = 0.03). Path analysis revealed that all of the research structural hypotheses were supported, as shown in Table 6. Behavioural intention is significantly influenced by effort expectancy (beta = .30; *p<0.001*), trust (beta = .24; *p<0.001*), performance expectancy (beta = .23; *p*<0.001), perceived security concern (beta = -.22; *p*<0.001), and social influence (beta = .11; *p*<0.005). Also, perceived security concern is significantly influenced by trust (beta=-.39; *p*<0.001). The explanatory power (R^2) of the model was also calculated as exhibited in *Figure 2*. The model shows that 0.56% of the variance in behavioural intention can be explained by performance expectancy, effort expectancy, social influence, perceived security concern, and trust.

Hypothesis	Structural path	Proposed Effect	Estimates			Result
			SRW	t-value	*p*-value	
H1	PE → BI	+	.23	6.16	$p < 0.001$	Supported
H2	EE → BI	+	.30	6.09	$p < 0.001$	Supported
H3	SI → BI	+	.10	2.90	$P < 0.005$	Supported
H4	PSC → BI	–	-.22	-6.07	$p < 0.001$	Supported
H5	TR → BI	+	.24	5.03	$p < 0.001$	Supported
H6	TR → PSC	–	-.39	-9.60	$p < 0.001$	Supported

Note: SRW= Standardized regression weight; PE= Performance expectancy; EE=Effort expectancy; SI=Social influence; PSC=Perceived security concerns; TR= Trust.

Table 6. Summary of Results of Structural Relationships

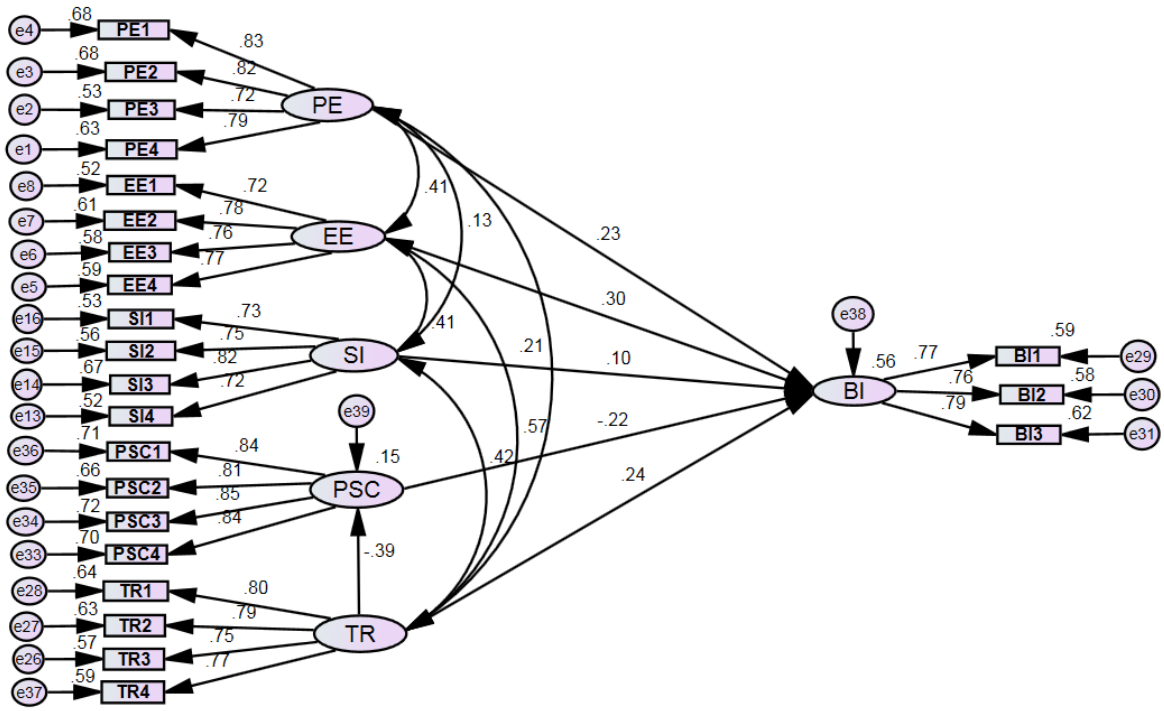

Figure 2. Results of Structural Model

6 Discussion

Within the context of healthcare consumers in developing countries, this study has demonstrated further concurrence with three of the UTAUT's variables. As Venkatesh et al. (2003) original model was designed to be used in organisational contexts, the findings from the current study support the necessity of extending the UTAUT model with variables related to the context of healthcare consumers.

The role that performance expectancy plays in the intentions of healthcare consumers was supported in our model (beta = 0.23, p<0.001), showing that the NEHR system's utilitarian advantages are pertinent to potential users, which is consistent with the research on e-health adoption (Garavand et al. 2016; Tavares and Oliveira 2016). Venkatesh et al. (2003) original UTAUT model found that compared to other variables in the model, behavioural intention was strongly predicted by performance expectance; however, in this study, trust and effort expectancy preceded performance expectancy in importance. Accordingly, the level of ease linked with using the NEHR system, as well as trust in service providers and the system, are the most important factors that influence the acceptance of the NEHR system. However, it is imperative for NEHR system developers to ensure that utilitarian advantages and features emanate from the system to promote and encourage future use and uptake.

The findings also confirmed effort expectancy as a significant predictor of behavioural intention to use the NEHR system (beta = 0.30, p<0.001), which contradicts the finding of Hoque and Bao (2015) study. Notably, the degree of ease associated with using the NEHR system had the strongest positive impact on healthcare consumers' behavioural intention. Participants perceived effort expectancy as the most critical factor impacting their behavioural intention to use the system. The unfamiliarity of the respondents with the system can account for this; because the NEHR system is being implemented in Saudi Arabia, all respondents were non-users. This finding implies that developers should ensure easy to use and friendly design to increase uptake in the future.

In the original UTAUT model, social influence was postulated as a significant predictor of behavioural intention (Venkatesh et al. 2003). In this study, behavioural intention was significantly explained by social influence; however, the impact of social influence was the lowest among other factors in the model (beta = .10; p=0.004). This proposition is supported by several studies, where a significant relationship was found between social influence (influence of friends and relatives) and behavioural intention, acceptance, adoption, or technology use (Hoque et al. 2017; Zhang et al. 2019). However, prior studies have revealed inconsistent results regarding the impact of social influence, with results varying among countries. For example, Cimperman et al. (2016) reported social influence had an insignificant impact on older people's intentions to use telehealth services in Slovenia. Similarly, Yuan et al. (2015) found no

significant impact of social influence on the use of health and fitness mobile applications in the United States. Cultural diversities may be a potential explanation of this differing behaviour. In this study, individuals' decisions seem to be influenced by the views of their relatives and friends; this can be attributed to the nature of family orientation and culture aspects in a middle eastern country like Saudi Arabia where people often rely on each other and value the opinion of family and relatives.

In our study, perceived security concern had a significant negative impact on participants' behavioural intention to use the NEHR system in the Saudi context (beta = -0.22, $p<0.001$). This illustrates that concerns over the protection of individuals' health-related information from unauthorised access may prevent healthcare consumers from accepting the NEHR system. This finding is consistent with the results of Ozok et al. (2017), and Abd-Alrazaq et al. (2019). The study's findings also revealed that trust had a significant positive effect on Saudi healthcare consumers' behavioural intention to use the NEHR system (beta = 0.22, $p < 0.001$). This result indicates that trust in government e-health applications in terms of security standards, as well as health practitioners in confidentially handling private health-related information, will significantly impact Saudi healthcare consumers' intentions to use the NEHR system. This finding is consistent with previous studies concerning e-health adoption in developed countries (Cocosila and Archer 2014) and developing countries (Hoque et al. 2017). Additionally, trust had a significant negative impact on perceived security concern (beta = -0.39, $p<0.001$). This implies that Saudi healthcare consumers who perceive the NEHR system and parties involved in its management and use as trustworthy are more likely to have less privacy and security concerns, and are, therefore, more likely to intend to use it.

Since the NEHR system in Saudi Arabia is still under implementation, this study is considered essential and timely. This study contributed to the understanding of healthcare consumers' behavioural intention towards NEHR' use. Considering the key predictors identified in this study will allow for regulations and design to be appropriately modified. Accordingly, developers should ensure an easy to use and friendly design to increase future uptake because participants' behavioural intention was strongly explained by the degree of ease associated with using the NEHR system. Additionally, wide publicity of the advantages and features of the NEHR system should be initiated by the MOH. Social Influence can also play a vital role in NEHR system adoption in Saudi Arabia. That is when one supportive user adopts the system, the level of motivation increases for others because of the encouragement from the social environment. The outcome of this study also suggests that clear regulations should be laid out by the government to regulate the mechanism of different access rules to different parties involved in healthcare field. Such interventions can prompt trust and decrease security concerns among the public towards accepting and using the NEHR system.

7 Conclusion, Limitations and Future Research

This study investigated the key factors impacting public acceptance and use of the NEHR system in Saudi Arabia. The proposed model explained 56% of the variance in behavioural intention, implying the presence of additional factors not yet identified. The results of this study suggest that the acceptance of NEHR are influenced by significant factors that should be considered and addressed to attain successful implementation of NEHR in Saudi Arabia. The Saudi government and developers of the NEHR should involve the public in the process of developing the regulation of health information exchange and designing the system in a way that meets target users' preferences and skills.

This study focused on making healthcare consumers' behavioural intention towards the use of the NEHR system something explainable and understandable; thus, the outcome of this study does not reflect or measure continuing use. Moreover, this study is cross-sectional so that further longitudinal studies can be considered. Future studies might examine the applicability of the proposed model to other developing countries, as well as different e-health applications.

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