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Moderating Effect of Political Readiness on The Determinants of E-Health Readiness in Libya

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Abstract

E-health system represents innovative technology that is reshaping modern healthcare delivery globally. However, low implementation exists among developing countries and the few adoption cases are characterized by massive implementation failure. The failure is mainly attributed to direct adoption of E-health models from other regions without considering the differences in context. Therefore, this study investigates the Moderating Effect of Political Readiness on between UTAUT factors (performance expectancy, effort expectancy, facilitating conditions) and TRI factors (optimism, innovativeness, discomfort, and insecurity) and E-health readiness in Libya. Through a survey questionnaire, data were collected from 369 Libya hospitals, and the hypotheses in the proposed model were tested by Partial Least Squares Structural Equation Modeling (PLS-SEM). The empirical results confirm that the positive and significant effects of optimism, innovativeness, performance expectancy, effort expectancy, and political readiness on E-health readiness, while insecurity and discomfort were negative and significant. Furthermore, the results showed that political readiness positively and significantly affected the relationship among insecurity, optimism and EHR. However, political readiness proved to have a negative influence on the relationship between innovativeness, discomfort, facilitating conditions and EHR. These findings suggest important factors influencing EHR in Libya. Finally, this study contributes significantly to the successful transformation of the e-health system by raising the level of e-health readiness among users in Libya linked to the adoption of direct models from different socio-economic contexts. Other theoretical and practical implications derived from the findings, and the limitations and future research directions are also offered.

Keywords: UTAUT Factors, TRI Factors, Political readiness, E-Health Readiness.

1. Introduction

The involvement of ICT in healthcare delivery brought greater benefits to both patients and healthcare professionals by improving access to decent quality of healthcare, and consequently better productivity of the healthcare systems, and overall economy (Alharbi et al., 2021; Kreps and Neuhauser, 2010, Rahimi et al., 2008; Dzenowagis, 2009). Therefore, it is potentially associated with E-health especially considering the consistently growing healthcare demand and limited availability of facilitating resources (Dyb et al., 2021; Alharbi et al., 2021; Kreps & Neuhauser, 2010). Although there is an increase in the use of internet as a source for health information and service delivery globally, the market for E-health is expected to keep expanding across regions of the world (Alharbi et al., 2021; Luk, 2018; Takeda, 2005; Kerwin et al., 2006; Cline & Haynes, 2001).

Consequently, E-health has brought answers to the bulk of these problems via electronic health record management and the use of ICT in diagnosis, appointment scheduling, and medication prescribing (Alharbi et al., 2021). As a result, health records are easily accessible online and upon request (Yosser, et al., 2020). E-health has established itself as a critical tool for enhancing the efficiency and efficacy of health care delivery systems. In recent years, affluent nations have embraced and implemented E-health systems, but it is still a relatively new occurrence in the majority of developing nations, such as Libya (Yosser, et al., 2020). The healthcare sector in poor nations has yet to fully leverage the potential benefits of information technology (Nakkas et al., 2015). Due to the slow pace of adoption, field research is confined to exploratory reports and project descriptions that place a major emphasis on technology (Cline & Haynes, 2001). However, there is an immediate need for research into methods and conceptual frameworks for assessing individuals' readiness to adopt E-health services (Cline & Haynes, 2001).

Yet, major barriers to these services like any other technological innovations are concerns on awareness, readiness and acceptance (Yosser, et al., 2020). Literature shows, however, that the effectiveness of E-health adoption requires a full E-health readiness evaluation of all stakeholders (Beebeejaun & Chittoo, 2017). Therefore, it is crucial to comprehend the E-health adoption readiness and its determinants. Previous studies lack a solid theoretical foundation (Car et al., 2008). A few notable studies in literature employed models such as TAM (Zayyad & Toycan 2018; Kgasi & Kalema, 2014, Coleman, et al., 2012), and UTAUT (Beebeejaun & Chittoo, 2017; Gholamhosseini & Ayatollah 2013- 2017; Khatun et al., 2015; Qureshi, et al., 2013; Qureshi, et al., 2014), Other theories includes social learning theory, self-determination theory, and organization theory tested by Sharif (2014) and Coleman, & Coleman, (2013). In addition, an important framework in this field is the Non-Adoption, Abandonment, Scale-Up, Spread, and Sustainability model (NASSS). The framework identifies seven potential domains that might complicate the adoption of E-health services (Otto & Harst, 2019). The authors of the NASSS framework also concluded that there is a lack of theoretical foundation for individual adoption processes and further suggested the use of UTAUT (Otto & Harst, 2019).

The challenges of healthcare delivery in developing countries considering the diverse ethnic, religious, and socio-cultural groups are huge (Swihart & Martin, 2020; Wang et al., 2018). In developing countries, poverty, ignorance, lack of resources, health facilities and bad leadership are spectrum of challenges disturbing health delivery (Yosser, et al., 2020). In addition, the old way of applying paper work to the management of the healthcare system is a difficult and ineffective process with several flaws (Yosser, et al., 2020). In the existing health system, most medical personnel are overworked and overwhelmed, thus in most cases they depend on their ingenuity and acumen to improvise in order to save lives (Yosser, et al., 2020; McMichael et al., 2005). This is because the healthcare professional to patient ratio is very high. Thus, to improve the efficiency of service in this sector, modern technology and innovations such as E-health will play a vital role, since adoption of ICT in health sector in developed and some developing countries have greatly enhanced the efficiency of services (Meskó et al., 2017).

Libya is dominated by the traditional healthcare settings where patients are not engaged in decision making with respect to their health issues and management as the decision is solely left to the healthcare professionals. Also, there is shortage of trained health personnel (Yosser, et al., 2020; Luk, 2018). The Libyan health system challenges are further complicated by corruption, outdated ideology, and alienation of even the simplest management concepts (El Oakley et al., 2013). The challenges of political conflict in Libya include damages to country's healthcare system especially the effect of destroying clinical infrastructures and the loss in healthcare professionals (Yosser, et al., 2020; Sullivan et al., 2011).

Different contributors discuss from different perspectives how the models might influence E-health readiness, but there is a mixed finding. Among the studies that reported a relationship between the two constructs of UTAUT and E-health readiness (Qureshi, et al., 2014; Qureshi, et al., 2013; Beebeejaun & Chittoo, 2017; Gholamhosseini & Ayatollah 2017; Khatun et al., 2015); these studies focus only on one or two factors from one model, such as: technical readiness, core readiness, social communication readiness, and engagement readiness, where these factors are only a part UTAUT model. More so, others studies examined only TRI factors (optimism, innovativeness, insecurity, discomfort) in relation to technology readiness, intention to adopt or actual technology use have frequently been inconsistent (Blut, & Wang, 2020). Some of these studies reported that, the relationship between TRI factors and E-health readiness was significant (Rahman et al. 2017), while others have reported no effects at all (Chen et al., 2013). Also, the review by Blut, and Wang (2020) showed that the direct impact of TRI factors is either weak or non-significant, thus suggesting that future studies should not consider TRI factors as an immediate, direct predictor of technology usage, thus, giving justification for the introduction of a moderator in the future study. All these studies could not adequately assess readiness as the studies focused on only a few factors or one model. Thus, a more comprehensive framework for assessing E-health readiness is required. According to that, it is consequently necessary to know the models that have arisen in addressing technology readiness and adoption (Kiberu, et al., 2019; Ronchi, 2019; Van et al.,

2015). Based on the lack of previous studies about assessing and adoption E-health readiness in developing countries such as Libya, this study attempted to combine both of TRI model and UTAUT model for assessing individuals' readiness to adopt E-health services. On the other side, with particular consideration to the recent political unrest in Libya and the current initiative to stabilize the government, this study introduces political readiness as a moderator and examines the effects of political readiness to improve or strengthen the links between independent variables and dependent variables.

Despite the fact that the literature describes the effects of UTAUT factors on EHR and TRI factors on EHR, there is still a need to investigate their impacts on HER when they be in one model (Iqbal et al., 2018). We use The Health Belief Model (HBM) (Rosenstock, 1974), Theory of Reasoned Action (TRA) (Fishbein and Ajzen 1975), and Theory of Planned Behaviour (TPB) (Ajzen & Fishbein, 1980) to illustrate how UTAUT and TRI variables, as strategic resources, help the health sector improve their services (Yosser, et al., 2020). In the context of hospitals, no prior research has explored the link between UTAUT factors, TRI factors, and EHR. In light of the current gaps in academic literature and the importance of these variables, the purpose of this study is to determine whether UTAUT factors, TRI factors are important to EHR.Furthermore, the impact of political readiness on relationship between UTAUT factors, TRI factors and EHR (Yosser, et al., 2020).

The rest of the manuscript is organized wherein the next section reviews the literature and develops hypotheses. Part 3 and part 4 deal with methodology and findings followed by discussion, implications in part 5, and finally limitations of the study in part 6.

2. Literature review and hypotheses development

2.1. TRI factors and EHR

TRI demonstrates that individuals are eager to utilize technology (Blut, & Wang, 2020). The four TRI constructs, optimism, inventiveness, discomfort, and insecurity, which measure people's propensity to utilize technology are optimism, inventiveness, discomfort, and insecurity (Yosser et al., 2020). A favorable attitude of technology and the conviction that it gave individuals greater control, flexibility, and productivity in their lives (Yosser et al., 2020; Parasuraman, 2000). This optimism was echoed by computer users who loved using computers, thought they accomplished more and were accomplishing more than they did a few years ago, and anticipated utilizing new technological goods and services. Younger users tended to be more optimistic than older users, and both men and women maintained some skepticism (Yosser et al., 2020; Parasuraman & Colby, 2001). According to Parasuraman (2000), a technology optimist believes that new technologies will provide individuals with more benefits, such as greater control, flexibility, and productivity at work. According to Walczuch and Lemmink (2007), optimists employ more tactics, which are often more effective in achieving the desired outcomes. In other words, optimists are less prone to fixate on unfavorable occurrences and are more likely to readily adopt new technologies. Thus, optimists view technologies as more valuable and simpler to use since they are

less frustrated by the negative consequences of technology (Parasuraman & Colby, 2001). Optimism, on the other hand, is a generic concept that captures people's particular emotions and implies that technology is positive (Nugroho and Fajar, 2017). Furthermore, "innovative persons are open to learning new and different technologies; they like being abreast of the most recent advancements; they feel others seek their assistance regarding technologies; and they are among the first in their group to buy a new technology." The majority of inventive customers are under 50 years old, and the majority of innovators are male (Parasuraman & Colby, 2001). Individuals with a high level of technological inventiveness are more intrinsically motivated to adopt new technologies and even enjoy the experience of trying them (Nugroho and Fajar 2017). When researching the acceptability of novel technology, Parasuraman and Colby (2001) argued that “individual inventiveness is crucial”.

Moreover, Chao (2019) stated that “discomfort may lead to people having uncomfortable sentiments about technology use, a similar concept to computer anxiety, which has been shown to have detrimental effects on technology”. This relates to the perception of loss of control over technology and the sense of being overwhelmed by it (Parasuraman & Colby, 2001). This exemplified the fear that many have towards technological items and services. They feel that technology excludes rather than includes individuals. In the same context, the uncertainty towards technology presented itself as anxieties of inability to use new technologies and unwillingness to transmit information via the Internet since the individual lacked confidence that it would reach its intended destination. Insecure individuals also feel that moving to a new technology is unsafe and that it might fail at the worst possible time (Nugroho and Fajar 2017). Chao, (2019) and Tsikriktsis, (2004) discovered that consumers are only prepared to incur the risk of a new technology if they feel it would provide them with substantial benefits. According to Siegrist (2000), persons with a high level of insecurity lack faith in the security of new technology and frequently seek reassurance. Thus, people may perceive some risk management when utilizing new technologies (Nugroho and Fajar 2017). In light of the current information, we thus offer the following hypothesis:

H1. Optimism positively influences E-health readiness in Libya

H2. Innovativeness positively influences E-health readiness in Libya.

H3. Insecurity negatively influences E-health readiness in Libya.

H4. Discomfort negatively influences E-health readiness in Libya.

2.2. UTAUT factors and EHR

The term UTAUT has been overused to describe the usage of several digital health applications, such as data exchange systems (Vanneste et al., 2013) and assessment tools for cognitive functions (Williams, et al., 2015). Kgasi and Kalema (2014) and Khoja et al. (2007) recommended that while designing a model for E-health evaluation, it is important to contextualize those components that represent regional or national issues. Based on HBM, TRA and TPB theories, expected performance is a construct of the UTAUT model which indicates to the degree to which healthcare

stakeholders such as professionals, patients, and management accept the E-health system's benefits. This includes effective medical record, patient privacy protection, enhanced patient information provision, and information provision and exchange on a timely basis (Bos et al., 2008; Baker, 2000). This includes “the efficient documentation of patient records (Protti, 2007; Schade et al., 2006), the protection of patients' privacy (Coiera et al., 2004; Galpottage et al., 2005), the better provision of patients' information (Embi et al., 2004; Sek et al., 2007), and the timely provision and sharing of information (Baker, 2000; Blobel, 2006)”. In addition, effort expectancy (EE) is a component of the UTAUT model that quantifies the degree of technology usability. EE, as defined by Venkatesh et al. (2003), is the degree of simplicity involved with the adoption of any technology. That is, it signifies the degree to which users of E-health including patients and health professionals will not be characterized excessive physical and mental efforts. The EE considers the link between the effort exerted in using E-health and the improvement in performance of the healthcare delivery and access (Zhou, et al., 2019; Yusif, et al., 2017). Thus, EE is much linked to the degree of readiness of E-health users. This is because the effort put in the use of E-health by patients and healthcare workers could vary based on individual characteristics and likely to influence readiness and adoption. This study adapts the items in the study by Beebeejaun and Chittoo, 2017.

In the same context, Zhou, et al., (2019) indicates that the degree to which an individual believes that organizational and technical infrastructure exists to support use of the system. These supporting structures includes; human resource, technological, core readiness, political and societal readiness (Zhou, et al., 2019). This aspect is concerned with human capital development and it measures aspect such as; access to personnel who are conversant with IT ideas and skills, and access to managers who are conversant with IT applications and their benefits. Access to IT personnel with suitable educational degrees and high-quality IT training (Gholamhosseini & Ayatollahi, 2017). Another facilitating condition in this study is the technology readiness. According to Khoja et al. (2007), technological readiness evaluates the existing ICT infrastructure (hardware required for EHR applications and network) (Kwankam, 2009), other available electronic resources (EHR-related software), IT support personnel (Leung et al. 2019), and healthcare providers' prior IT experience (Halamka et al., 2006). Also, this study among other factors considers societal and cultural factor as facilitating condition. This item was covered in both tools and addressed any interactions between the institution in question and other healthcare institutions in the region and beyond. Specific societal preparedness components addressed aspects of accessibility, such as content relevance and sociocultural considerations, as well as gender and social class inequality and other cultural hurdles (Zhou, et al., 2019). Internal communication frequency and medium, as well as organizational communication ties to hospitals and administrative centers providing treatment in partnership with other healthcare organizations, impact the societal preparedness assessment outcome (Zhou, et al., 2019). Thus, based on the literature, the following hypothesis was developed:

H5. Performance expectancy positively influences E-health in Libya.

H6. Effort expectancy positively influences E-health readiness in Libya.

H7. Facilitating conditions factors positively influences E-health in Libya.

2.5. The moderating of political readiness

The importance of political will proxied by political readiness on E-health behavioral intension of users have been emphasized by Granja, Janssen and Johansen (2018); Qureshi, Ahmad and Nawaz (2012) and Hudson et al., (2018). However, several studies (Liu et al., 2019; Ojo, et al., 2012; Jennett, et al., 2005; Khoja, et al., 2007) proposed that context be considered while building a model or framework for E-health evaluation in underdeveloped nations. Consequently, given the context of this study as a conflict region, and the critical role of political will in influencing E-health use or adoption thus the study considered political readiness as a moderating variable in this study. Political readiness factor was included as a new variable for this study given its important role in implementation of E-health and other new technology as pointed out by (Granja, et al., 2018; Qureshi, et al.,2012). Also, the recent crises that affected governance suggest that political readiness for E-health adoption could have a strong moderating effect on any technology adoption in Libya .Thus, this study's choice of moderator was considered based on the recommendations on the importance of political factor in the E-health domain (Granja, Janssen & Johansen, 2018). Specifically, Granja, et al., (2018) emphasizes the importance of policies or political will to implementation and success technological innovations such as E-health. In addition, Government e-policies regarding the usage and use of enabling technologies are a crucial aspect of implementing ICT in every area, including the country's health or public health system (Qureshi, et al., 2012; Chen & Perry, 2006). The World Health Organisation in 2016, explicitly emphasized the relevance of political commitment by governments in the adoption of E-health. This commitment requires to be supported with funds that are sustainable for eHealth program implementation and capacity-building and aligning the E-health with national strategy .

Also, the study by Ekeland and Linstad (2020) emphasized the importance of political factor to E-health implementation by using a Political-Governance Model. Given the crises background of our study area, National policies, Government finance of services on E-health and status of public hospital enrolment and use of E-health is paramount to understand the readiness level. To comprehend the significance of the current political turmoil on E-health implementation, it is crucial to evaluate the perceptions of political readiness in Libya and its impact on E-health readiness. In addition to other elements from the literature, this study suggests the addition of political readiness to its assessment framework. This category was also included to evaluate the existence of policies at the government and institutional levels to address common concerns like licensing, liability, and reimbursement (Ekeland & Linstad, 2020; Qureshi et al., 2012). Specific policy preparation factors addressed accessibility criteria such as the legal and regulatory environment and political intent. Thus, the study was further extended to examine the moderating effect of political readiness on the E-health technology readiness factors. Political readiness as a moderator can have

a profound impact on user adoption and shift the dynamics in E-health readiness framework. Consequently, political readiness has a favorable effect on the relationship between factors of UTAUT, TRI and EHR, and this study offers the following hypothesis:

H8. Political readiness moderates the relationship between optimism and E-health readiness in Libya

H9. Political readiness moderates the relationship between innovativeness and E-health readiness in Libya.

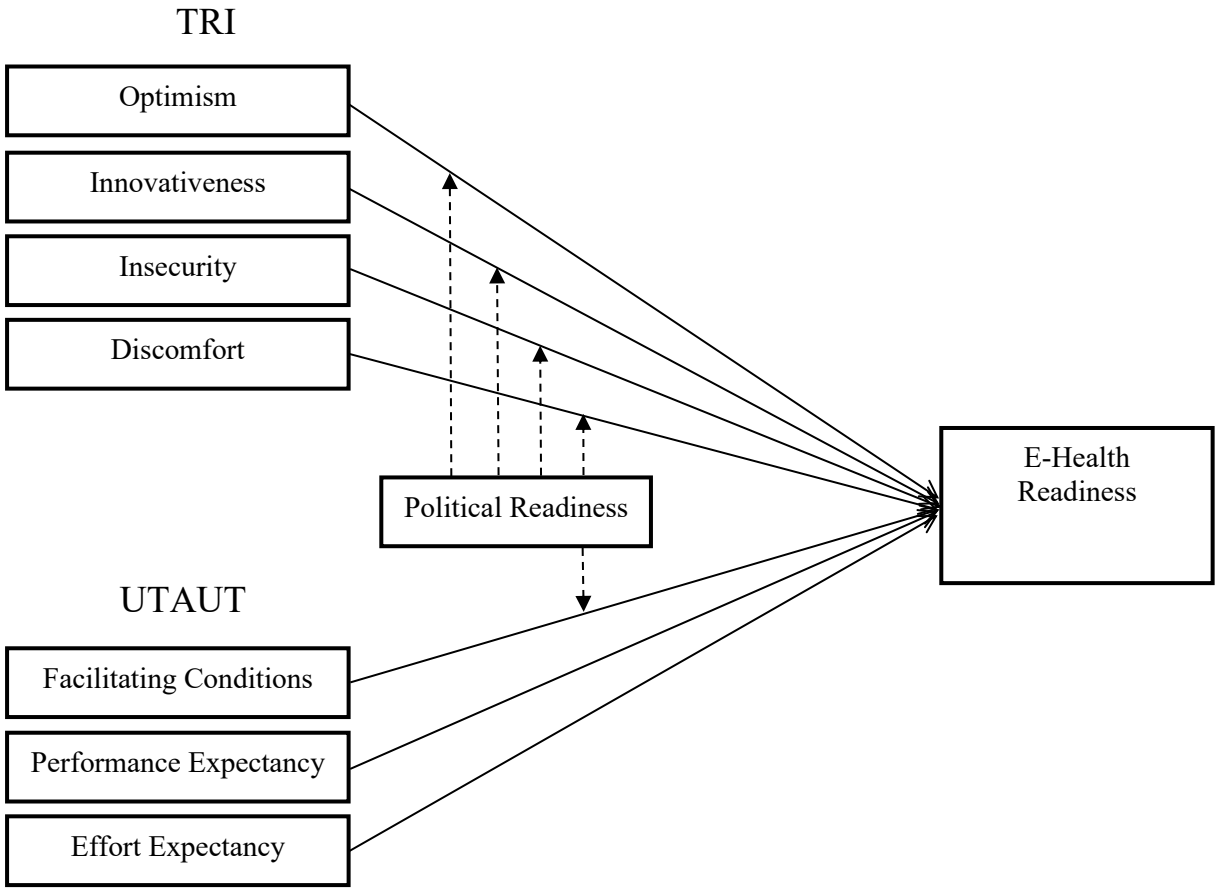
H10. Political readiness moderates the relationship between insecurity and E-health readiness in Libya.

H11. Political readiness moderates the relationship between discomfort and E-health readiness in Libya.

H12. Political readiness moderates the relationship between facilitating condition factors and E-health readiness in Libya.

Based on the "theoretical framework and hypotheses derived in the second section, the conceptual model of this study" is represented as shown in Fig. 1.

Figure 1. Conceptual Framework



3. Methodology and results

3.1 Research population and sample

This study was relied upon primary data collected from Libyan health sector stakeholders in each of Tripoli Medical Center, Central Tripoli, Diabetes and endocrine – Tripoli, General Mezda, Ali Omar Askar Asbia of Libya. The Libyan health sector was evaluated because the study contrasted EHR, which the health sector constantly seeks to acquire in order to meet dally standards, to service hospitals. According to the Libyan Ministry of Health (2020), there were 9865 patients at these facilities (Patients, Healthcare professionals, Management staff). According to Krejcie and Morgan's (1970) table for estimating sample size, this study's sample size is 370. In order to decrease sample size error and account for typical non-response concerns in survey research (Malhotra, 2012), this study employed Salkind's well-known approach for changing sample size (Bartlett et al., 2001). Salkind proposed increasing the sample size by 40 to 50 percent to accommodate for missing questionnaires and unwilling individuals. Given that the projected sample size for this study was 370, the following calculation illustrates the 50% increase.

$$y = \frac{50}{100} \times 370$$

Where: y = Unknown increase of 50%

Actual sample size = 370

$$y = \frac{5}{10} \times 370$$

$$y = 0.5 \times 370$$

$$y = 185$$

As a result of the foregoing, 50% of this study's sample size is 185, compared to the original sample size of 370. As a consequence, the new sample size will be 370 + 185 = 555 respondents drawn from the study population. This demonstrates that 555 survey questionnaires were distributed evenly among the respondents.

Table 1. Sample Size of the Stakeholder in Libya Hospitals

Sampled Hospitals	Population	Sample size
Tripoli Medical Center	3652	235
Central Tripoli	2609	120
Diabetes and endocrine – Tripoli	1322	72
General Mezda	761	39
Ali Omar Askar Asbia	1521	89
Total	9865	555

To obtain the necessary data, a self-administered questionnaire was employed, with Patients, Healthcare professionals, and Management personnel serving as the sample unit for this study due to their understanding of the various health sector operations. Responses were 379 out of 555 questionnaires, “representing an average response rate of 68.7% of the total sample size”. “After preparing data for processing and analysis, however, ten questionnaires that were incomplete were discarded”. Consequently, this study utilized 369 questionnaires for further investigation. Thus, the legitimate answer rate was 66.8%.

3.2 Measures

The questionnaire was used to collect the necessary data for measuring the associations between the variables of this study. According to the literature, the questionnaire contained all variables, and a Five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) was used to measure the responses. UTAUTand TRI factors (the independent variable) were measured using 57 items that assessed optimism, innovativeness, discomfort, insecurity, facilitating conditions, effort expectancy, and performance expectancy, adapted from Beebeejaun & Chittoo's 2017, Parasuraman & Colby, 2001, Khoja et al. 2007, and Yossar et al., (2020). While EHR (the dependent variable) was assessed using four questions that were derived from Campbell et al., (2001); Jannett et al., (2005), Kgasi and Kalema (2014), and Yossar et al., (2020). Lastly, Political Readiness (the moderator variable) was tested using eight questions modified from Khoja et al., 2007; Beebeejauna & Chittoob, (2017); and Qureshi et al., 2005. (2012).

3.3. Data analysis and results

As suggested by Hair et al., (2005) “SEM (Smart PLS 3) was employed in this study to test the proposed model. Numerous characteristics of PLS-SEM contribute to its widespread application in management research (Goaill et al., 2014)”. It is deemed “appropriate for small samples (Henseler et al., 2009) because, when applied to complex models with small sample sizes, it demonstrates greater statistical power than the covariance-based SEM (Hair et al. 2016)”. This is highly appropriate given the sample size of 369 cases in the current study.

The PLS model performs the analysis using two models, the Measurement and Structural Models. Whereas the measurement model includes testing the model's reliability and validity, the structural model includes testing hypotheses, interpreting variance, and determining the model's predictive relevance (Q2).

3.3.1 Measurement model

To evaluate the measurement model of this study, Cronbach's alpha (α) and composite reliability (CR) were utilized to determine the internal consistency among scale items which call reliability analysis. Table 2 displays the findings of and CR for all constructions where their values are more than 0.70, indicating that there is clear consistency among items for all constructs (Nunnally & Bernstein, 1994).

Through confirmatory factor analysis (CFA), construct validity, including convergent and discriminant validity, was also evaluated. The convergent validity is fulfilled if all items have loadings of 0.70 or higher and are statistically significant (Hair et al., 2011). In addition, the average variance extracted (AVE) must be larger than the generally recognized cutoff of 0.50. (Hair et al., 2011). Table 2's results reveal a high level of convergent validity.

Table 2. Analysis of Convergent Validity

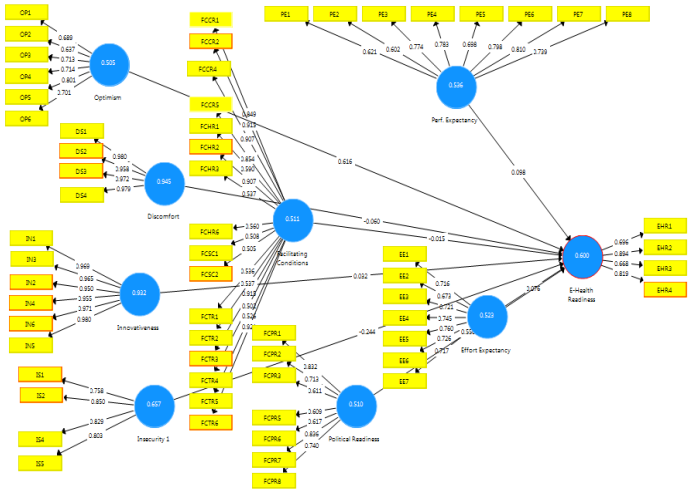
Construct	Loading	α	CR	AVE
Optimism	0.689	0.807	0.859	0.505
Discomfort	0.980	0.981	0.986	0.945
Innovativeness	0.969	0.985	0.988	0.932
Insecurity	0.758	0.826	0.884	0.657
Performance Expectancy	0.621	0.875	0.901	0.536
Effort Expectancy	0.716	0.850	0.885	0.523
Facilitating condition	0.849	0.934	0.940	0.511
Political readiness	0.832	0.838	0.878	0.510
E-health Readiness	0.696	0.771	0.856	0.600

In addition, “as demonstrated in Table 3, the discriminant validity of the model is strong, as the square root values of AVE dominate the correlations of all components (Fornell & Larcker, 1981)”. “This indicates that the correlation between indicators and their respective variables is stronger than that of other factors”.

Table 3. Analysis of Discriminant Validity

Construct	DIS	EHR	EE	FC	IN	INS	OP	PE	PR
DS	**0.980**								
EHR	0.171	**0.712**							
EE	0.138	0.629	**0.722**						
FCCR	0.249	0.198	0.398	**0.849**					
IN	0.079	0.144	0.092	0.080	**0.969**				
INS	0.038	0.696	0.538	0.194	0.143	**0.824**			
OP	0.075	0.106	0.662	0.238	0.154	0.005	**0.812**		
PE	0.062	0.652	0.716	0.262	0.080	0.679	0.689	**0.824**	
PR	0.112	0.139	0.609	0.224	0.203	0.758	0.151	0.98	**0.832**

Figure 2. Measurement model



3.3.2 Structural model

In this section, we will employ bootstrapping with 500 subsamples and the blindfolding method to examine the validity of the hypotheses and predictive utility of the proposed model. The path coefficients (β) values, t-statistics, and p-values were used to determine whether the relationships between model constructs (UTAUT factors, TRI factors, political readiness, and EHR) are statistically significant (p 0.05, p 0.01, or p 0.001). To validate the study hypotheses and determine if the proposed model is appropriate, the overall coefficient of determination (R_2) was calculated. According to Chin (1998), this coefficient demonstrates three levels of predictability (0.10 = weak, 0.33 = moderate, and 0.67 = substantial). TRI factors, UTAUT factors, and PR can explain 0.911% of the variance in EHR, which falls within the substantial range.Table 4 includes the results R_2.

Table 4. R-square Result

Latent Variable	Variable Explained (R-square)
E-health Readiness	0.911%

In addition, the effect size of the latent factors on the dependent variable was estimated using f2 analysis, which complements R2 (Chin, 2010). The f2 values (between 0.002 and 0.11, from 0.15 to 0.35, and above 0.35) “are used to depict the effect sizes (small, medium, and big) for the predictive variables”. According to Cohen (2013), the p-value can indicate the existence of an effect, but it does not reveal the effect size. Table 5 displays all f2 results according to impact size: two relationships are large, four are moderate, and two are small.

Table 5. Effect Size of the Latent Variables

Construct	**F-Squared**	**Effect Size**
Discomfort	0.037	Moderate
Effort Expectancy	0.034	Moderate
Facilitating Conditions	0.002	Small
Innovativeness	0.011	Small

Insecurity	0.207	Moderate
Optimism	0.178	Large
Perf. Expectancy	0.033	Moderate
Political Readiness	0.229	Large

Additionally, the Q2 was assessed in PLS 3 using the blindfolding technique. Given that all of the Q2 values are above 0.0000, as stated by Hair et al., (2011) the resulting Q2 values in Table 6 indicate that the model has a proper predictive quality.

Table 6. Predictive Quality of Model

Constructs	**SSO**	**SSE**	**Q^2 (=1-SSE/SSO)**
Discomfort	1,476.0	1,476.0	
E-health Readiness	1,476.0	730.07	0.505
Effort Expectancy	2,583.0	2,583.0	
Facilitating Conditions	5,904.0	5,904.0	
Innovativeness	2,214.0	2,214.0	
Insecurity 1	1,476.0	1,476.0	
Optimism	2,214.0	2,214.0	
Perf. Expectancy	2,952.0	2,952.0	
Political Readiness	2,583.0	2,583.0	

In addition, Table 7's hypothesis test findings demonstrate that optimism and innovativeness positively influence EHR in hospitals of Libya ($\beta = 0.608$, $t= 6.941$, $P< 0.000$ and $\beta = 0.030$, $t= 1.914$, $p<0.05$), Thus, H1 and H2 were supported. The results also indicate that insecurity and discomfort negatively relate to E-health readiness, and the results proved to be significant ($\beta= -0.241$, $t= 7.523$, $p<0.000$ and $\beta= -0.060$, $t=3.483$, $p<0.001$). Thus, H3 and H4 were supported. Regarding the hypothesis H5 and H6, the results show that performance expectancy and effort expectancy positively influences E-health readiness ($\beta= 0.099$, $t= 3.284$, $p<0.001$ and $\beta=0.076$, $t=3.721$, $p<0.000$, respectively). Thus, H5 and H6 were supported. Besides, the results have revealed that the higher the perception on facilitating conditions, the greater will be the overall E-health readiness. However, the result is insignificant ($\beta= 0.013$, $t=0.899$, $p<0.369$). Consequently, H7 was not supported.

Table 7. Direct Effect

H	**Path**	**β**	**T-value**	**P-value**	**Result**
H1	Optimism -> HER	0.608	6.941	0.000	Supported
H2	Innovativeness -> HER	0.030	1.914	0.056	Supported
H3	Insecurity -> HER	-0.241	7.523	0.000	Supported
H4	Discomfort -> HER	-0.060	3.483	0.001	Supported

H5	Perf. Expectancy -> HER	0.099	3.284	0.001	Supported
H6	Effort Expectancy -> HER	0.076	3.721	0.000	Supported
H7	Facilitating Conditions -> HER	-0.013	0.899	0.369	Not Supported

"Recommended: t-values > 1.96 Notes: *** p < 0.001; ** p < 0.01; * p < 0.05"

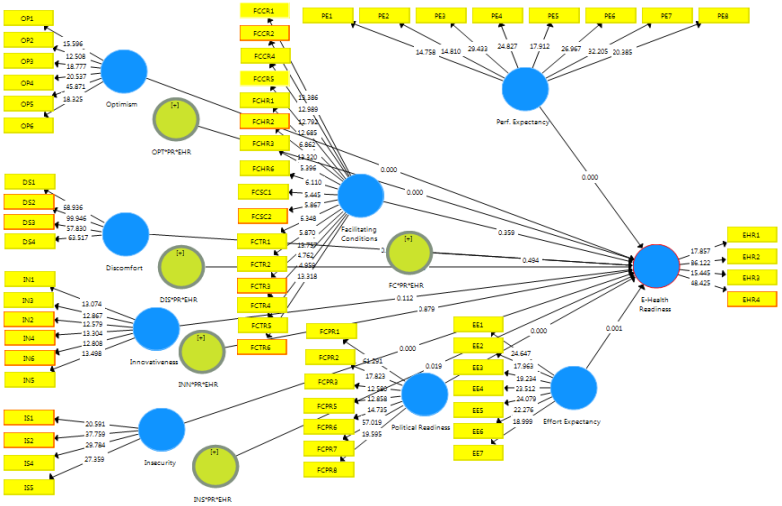
To evaluate moderation, bootstrapping approaches have been used (Genc et al., 2019). Precisely, we investigated the moderation of political readiness on the TRI factors, UTAUT factors -EHR relationship, with regard to the moderation effects, the findings are as follows: the results in Table 8 indicate that political readiness moderate the relationship between both of optimism, insecurity and EHR. Consequently, H9 and H11 were supported. Where the findings appear that political readiness not moderate the relationship between both of innovativeness, discomfort, facilitating conditions and EHR. Consequently, H10, H12, H13 were not supported.

Table 8. Indirect Effect

H	Path	β	T-value	P-values	Result
H8	OPT*PR*EHR-> EHR	0.089	3.810	0.000	Supported
H9	INN*PR*EHR-> EHR	-0.003	0.153	0.879	Not Supported
H10	INS*PR*EHR-> EHR	0.060	2.340	0.019	Supported
H11	DIS*PR*EHR-> EHR	0.026	1.409	0.159	Not Supported
H12	FC*PR*EHR-> EHR	-0.014	0.684	0.494	Not Supported

Recommended: t-values > 1.96 Note: * p < 0.05

Figure 3. Structural Model



4. Discussion

In response to a call by Yossar et al., (2020), to conduct more investigations on TRI factors, UTAUT factors and PR relevance in the EHR context. Based on the HBM, TRA and TPB theories, this paper introduced valuable results on the importance of the TRI factors, UTAUT factors with a high level of PR in improving EHR. Despite the literature (Qureshi et al., 2014; Nugroho and Fajar 2017; Blut & Wang, 2020)

which illustrates that the TRI factors, UTAUT factors -EHR relationship is non-significant, this study disclosed the opposite. The evidence offered herein emphasized that that the positive and significant effects of optimism, innovativeness, performance expectancy, and effort expectancy on E-health readiness, while insecurity, discomfort and facilitating conditions were negative and significant. These findings suggest important factors influencing EHR in Libya. This supports the results of Liu, et al., (2019); study, which found that TRI factors or UTAUT factors enhances EHR in a turbulent environment, and supports the traditional view of flexibility, thinking that it is an adaptive response to the environment (Liu, et al., 2019). The findings of the study indicated that indicated that to improve the success of E-health implementation projects and achieve greater performance, there is a need for concerted effort to effectively and efficiently manage individual perceptions such as optimism, innovativeness, insecurity, discomfort, performance expectancy, effort expectancy. Political readiness is also particularly important through the enabling policies to support adoption, provision of required infrastructures. With regard to Libya, this study avails government and E-health sector the opportunity to discover, develop, implement and utilize the framework as strategies that will improve the success of E-health implementation projects. This study could be considered as a major initiative to contribute to the transition to E-health in Libya and overcome the failure that could result from adoption of models in other non-similar regions.

In addition to the aforementioned, the outcomes showed that political readiness positively and significantly affected the relationship among insecurity, optimism and EHR. However, political readiness proved to have a negative influence on the relationship between innovativeness, discomfort, facilitating conditions and HER, so the link between some of TRI factors, some of UTAUT factors and EHR is not positive when PR is low. That is, the TRI factors, UTAUT factors –EHR relation is not positive in all cases. Libya is facing difficulties in the form of crisis, government instability and inefficiency in the healthcare services accessioned by the low manpower in the health sector and movement restriction. However, it is known that political readiness offers an important opportunity to conforms to the assertion that the technology adoption behaviour is usually subjected to specific policies by the state. According to that, adoption is considered to be dependent on government provision of the conditions for private beneficiaries or citizens, the providers, both private and multilateral financiers to ensure the adequate investments in the required technology. Given the current political terrain in Libya, which is characterized by political crises, it is critical to consider the context of the studied region in any technology adoption study. The political conflict in Libya has undoubtedly impacted the health sector, which will have a significant impact on EHR.

5. Theoretical and practical implications

HBM, TRA and TPB represent the basis for our present study in examining the effect of TRI factors and UTAUT factors in order to maximize the efficiency and success of E-health implementation. Thus, it is critical to integrate TRI factors and UTAUT factors in order to maximize the efficiency and success of E-health implementation.

The proposed integration of the TRI and UTAUT models is considered multi-dimensional because it incorporates critical factors influencing readiness behaviour through the use of two widely accepted. To substantiate the preceding statement, the current study makes significant contributions to existing body knowledge by not only proposing an integrated TRI factors and UTAUT factors, but also by assessing the role of political readiness in moderating the direct relationship .

For this point of view, the study provides empirical evidence to support the HBM, TRA and TPB theories. The HBM theory focuses on individual beliefs about health conditions, which predict individual health related behaviours. In other words, it used to explain and predict individual changes in health sector as a major determinant of E-health readiness (Green et al., 2020; Rosenstock 1974). Therefore, based on this theory, determinates could expand further including all “optimism, innovativeness, insecurity, discomfort, performance expectancy, effort expectancy and facilitating condition”, hence, health sector' success depending on these factors in improving application and management of the factors that help them to construct a sustainable competitive advantage (Rosenstock, 1974). In addition, the basic idea of TRA theory is explained the evaluation of individual`s personal behavioural facets in connection to the acceptance and utilization of computers technology. The theory asserts that there are beliefs that affect and influence individual intentions which further transform into human actions (Bélanger & Carter 2008). The theory has equally argued that health sector can achieve improvement in their performance if they effectively align their key variables (Fishbein and Ajzen 1975). Furthermore, TPB is a theory used to anticipate and comprehend behavior. It proposes that behavior is instantaneously decided by behavioral intents, which are in turn influenced by a mixture of three factors: attitude toward the behavior, subjective norms, and perceived behavioural control (Ajzen & Fishbein, 1980; Fishbein, 1967). According to this, TPB enables the prediction of specific behavior in a given situation, such as optimism, innovativeness, “insecurity, discomfort, performance expectancy, effort expectancy, and facilitating condition, and demonstrates” that overall attitudes and personality traits are involved in determining E-health readiness, but that their impact can only be discerned by examining broad, aggregated, valid patterns of behaviour.

In this case, the findings indicate that when the TRI factors (optimism, innovativeness, insecurity, discomfort) are integrated into and internalized by the UTAUT factors (“performance expectancy, effort expectancy and facilitating condition”), as well as with the supportive political readiness, then the health sector will create and assessment a good E-health readiness. In sum, within the premises of HBM, TRA and TPB theories, this study found empirical evidence that E-health readiness can be explained by aligning some factors, TRI factors (“optimism, innovativeness, insecurity, discomfort) and UTAUT factors (performance expectancy, effort expectancy and facilitating condition”) together that have been some of them moderated by the political readiness.

In addition to the theoretical implications the findings of the study imply several contributions to practice in favour of various stakeholders such as patients, healthcare

staff and hospital managements. The findings regarding the factors measured in this study reveal important individual factors influencing the readiness behaviour of E-health in Libya. This will guide users on the critical determinants of their readiness and also improve their understanding and use of E-health services. The findings of this study provide a framework for successfully managing healthcare challenges in the context of E-health, particularly, the benefits of the study to Libya's healthcare managers, professionals, and students. Other developing nations could also benefit from the findings of this study. This study will also serve as a guide to the Libya's government, E-health policy makers and the healthcare agencies such as hospitals in Libya, WHO, and other organisations to have an in-depth comprehension of the manner by which the EHR can be assessed, managed in order to ensure successful implementation and also guide against loss of financial investment that could result from failure due to the adoption of frameworks or models in other contexts. Furthermore, the framework for this study serves as a reliable guide for developing and implementing necessary policies that will serve as a mechanism for improving the overall E-health adoption project

6. Conclusions, Limitations and future research

The study's integration of the TRI and UTAUT models provides a framework for researchers to measure preparedness and other behavioural intentions to accept the emerging E-health system. When introducing new technology, such as E-health, great emphasis should be placed on users and their overall attitudes toward technology, particularly in contexts where testing the system prior to adoption may be impractical. After gaining a general understanding of users, the appropriate actions can be done to launch effective implementations. Thus, the integration of the two models results in a holistic assessment, which is particularly important given that the adoption of new technology involves both individual and system-level aspects. Additionally, the integrated model complements preceding models by emphasizing both individual and system-level aspects .The study's primary findings indicated that optimism and political readiness were the strongest determinants of future EHR system adoption intentions among patients, healthcare professionals, and management. Taken together, the study's major findings, particularly the 91.1 % R-square value, show that EHR can be explained by models such as the combined TRI and UTAUT models. However, in differing countries or locations, distinct variables appear to predict intentions to adopt healthcare technology. Thus, future study may examine the cultural and environmental implications on consumers' adoption of healthcare technology when employing combined versions of the TRI and UTAUT.

Additionally, this research suggests additional future studies to address other EHR-related difficulties. The study's limitation is the use of two questionnaires to collect data. A mixed-methods technique may be used to conduct an in-depth investigation. The cross-sectional survey could only account for the phenomena at one moment in time. The methodology could be expanded to include longitudinal research that elucidates more fundamental findings with post-pandemic consequences. However,

this study's findings for pre-service teachers may be generalizable to higher education students from other disciplines.

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