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Assessment of the Knowledge, Attitude and Practice of E-Health Among Physicians Working In Universal Health Insurance Hospitals in Port Said City, Egypt

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A B S T R A C T

Background: Adoption of electronic health (E-health) is essential for implementing health priorities. Objective: to assess the knowledge, attitude, and practice of E-health tools among physicians working in the Universal Health Insurance (UHI) hospitals in Port Said City, Egypt, to underline their predictors and to identify the barriers of implementation. Methods: A cross-sectional study was conducted using a structured pre-designed validated interview questionnaire. The study targeted physicians working in eight Universal Health Insurance (UHI) hospitals. The calculated required sample size was 393 participants. Significance was set at a 95% level of confidence. Results: The prevalence rates of good knowledge of electronic health records (EHRs), telemedicine, mobile health (m-Health) were 47.5%, 28.5, and 21.9%, respectively. Work experience was a common independent significant predictor of knowledge regarding EHRs, telemedicine, and m-Health [(AOR (95%CI): 2.2(1.5-3.2), 1.9 (1.3-2.9), 2.2 (1.4-3.4), respectively], and p<0.001 for all of them. Also, practicing E-health and receiving digital training were significant independent predictors regarding EHRs [(Adjusted OR (95%CI): 4.1 (2.4-7.1), 1.7 (1.2-2.5), p<0.001)]. Physicians had an overall positive attitude towards E-health tools (99.6%). Most physicians use EHRs in hospitals (80.6%). The cost of implementation was a potential barrier to adopting E-health tools. Conclusions: Despite the good attitude towards E-health, most physicians reported poor knowledge of such tools. EHRs were highly adopted in UHI hospital while other tools were not yet adopted. The study highlights the need for specific training programs targeting the weak points in the knowledge and practice of adopted E-health tools.

INTRODUCTION

According to the World Health Organization (WHO), digital health (DH) is a broad term that refers to using digital technologies in patient care, research, disease tracking, healthcare providers' education, and public health surveillance.[1] Digital health includes among others, electronic health (E-health) and artificial intelligence (AI). Electronic health means supporting health fields with information and communication technologies.[1-4]

E-health includes telemedicine, mobile health (m-Health), and electronic health records (EHR). M-health provides medical services such as medical

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records, data enrolment, and screening with mobile devices. Telemedicine is the delivery of health care and communication at a distance. EHR is a system that includes all information related to the patients, such as their medical history and the provided services. [1,2,5] Adoption of E-health is essential for implementing health priorities such as universal health coverage (UHC) as it enhances the quality of health, increases the accessibility to health records, enhances monitoring of patients, and achieves health equity.[6]

Egypt has started to implement DH technologies such as EHRs in Universal Health Insurance (UHI) hospitals and robotic surgery at Ain Shams and Qasr El-Aini Hospitals. Also, the faculty of medicine at Ain Shams University has initiated a virtual hospital for online consultation and diagnosis. [7-9] Despite the benefits of DH tools, multiple barriers face their implementation. These barriers could be administrative (such as regulations and high costs), healthcare provider-related (such as challenges in dealing with technology, high workload, and resistance to change), customer-related (such as age, level of education and awareness), or patient-provider relationship challenges. [5,10]

Several studies have assessed physicians' knowledge and attitudes toward DH tools. Some studies have focused on a single technology like telemedicine or EHRs. Also, some studies investigated using such technologies within a single specialty such as cardiology or radiology.[1-3,11-24] In Egypt, limited studies were conducted to explore DH, and they mostly focused on a single aspect of DH which is telemedicine.[10,12,23] No previous studies were conducted within the new UHI system. Therefore, this study aimed to assess the knowledge, attitude, and practice of E-health tools (telemedicine, m-Health, and EHRs) among physicians working in UHI hospitals in Port Said city, to underline their predictors and to identify the barriers to their implementation.

METHODS

A cross-sectional study with an analytic component was adopted in the UHI Hospitals in Port Said Governorate. The study included four general hospitals (El-Zohor Central Hospital, As-salam Port-Said Hospital, Alhayat Port-Fouad Hospital, El-Mabarra Hospital) and four specialized hospitals (El Tadamon Specialized Hospital, El-Nasr Specialized Hospital, Obstetrics and Gynecology Hospital, and Ophthalmology Specialized Hospital).

Target population were Physicians working at the UHI Hospitals in Port Said including all specialties.

The sample size was calculated using relevant formula.[25] Prevalence rates of good knowledge regarding EHRs, telemedicine, and mobile health were 36.7%, 36.7%, and 20% according to the results of the pilot study. Assuming 95% significance level, the calculated sample size was 357 participants, and 10 % was added to count for non-response, the total minimum required size was 393 participants. Data was collected during the period from May 2023 to January 2023 including all UHI hospitals. Researchers attended all departments of the hospitals at all shifts and contacted all attending physicians in each department with a 26.03% non-response rate.

Study tools: A predesigned validated interview questionnaire (Additional file) was administered. The questionnaire was developed by researchers after a thorough review of the literature to identify validated and relevant items from previously established studies. [9-12,16,20-24] Items were selected based on their agreement with the study objectives and were combined to form a comprehensive measure of knowledge, attitudes, practices, and barriers. The questionnaire was validated by two independent academic experts (one professor and one associate professor of public health) to ensure their relevance, clarity, and appropriateness. The scale showed excellent content validity, as all items were consistently rated as highly relevant by both experts. The questionnaire included the following sections: (1) Socio-demographic data such as age, sex, level of education, and Computer literacy [16] (measured by asking about the usage of some computer applications such as Microsoft Word, Microsoft Excel, Microsoft PowerPoint, database access, photo editing, Internet, E-mail, Facebook and WhatsApp), workplace, specialty, years of experience and training on any DH tool. (2) Self-reported knowledge of E-health: Knowledge of each of the E-health tools (EHRs, telemedicine, m-Health applications) was assessed using five-point Likert scale one question for each tool. Each question was to rate their knowledge from 1 to 5 (0=None, 1=low, 2=medium, 3=high, 4=expert). Responses were categorized as "good knowledge" if the participant reported (high or expert).

Table 1: Socio-demographic characteristics of our population (N = 484)

	Frequency	%
Sex		
Male	321	66.3
Female	163	33.7
Educational degree		
Bachelor	268	55.4
Master or higher	216	44.6
Digital health training		
No	318	65.7
Yes	166	34.3
Internet access		
Don't have access	4	0.8
Have access	480	99.2
Computer literacy		
Poor	206	42.6
Good	278	57.4
Workplace		
Hospital 1	78	16.1
Hospital 2	61	12.6
Hospital 3	86	17.8
Hospital 4	78	16.1
Specialized hospitals	181	37.4
Years of experience		
≤5 years	257	53.1
> 5 years	227	46.9

The scale showed high content validity (S-CVI (Scale Content Validity Index) =1, S-CVI universal agreement = 1), and acceptable internal consistency (Cronbach's Alpha = 0.719). (3) Attitude towards E-health: Attitude was assessed through twelve questions for E-health each using a five-point Likert scale. For each tool, there were 4 statements, 2 positive and 2 negatives. Positive statements were coded from 1 to 5 (1=strongly disagree, 2= disagree, 3=neutral, 4=agree, 5=strongly agree), and negative statements were coded reversely from 5 to 1. The total score of attitudes ranged from 12 - 60. The hypothetical median was thirty-six. Responses were categorized "positive" if the score was above the median. The scale showed high content validity (S-CVI (Scale Content Validity Index) =1, S-CVI universal agreement = 1), and moderate internal consistency (Cronbach's Alpha = 0.649). (4) Practice related to E-health: It was determined by one separate question asking the participants about the tools they use in UHI hospitals. The scale showed high content validity (S-CVI (Scale Content Validity Index) =1, S-CVI universal agreement = 1). (5) Barriers to the implementation of E-health: They were determined through a multiple-choice question including barriers such as cost of implementation, lack of training, privacy concerns, lack of evidence for effectiveness, patient resistance, patient literacy, lack of technical support, and lack of regulations. The scale showed high content validity (S-CVI (Scale Content Validity Index=1, S-CVI universal agreement=1), and acceptable internal consistency (Cronbach's Alpha=0.7).

A pilot study including thirty participants was conducted to ensure the clearance of the questionnaire and to ensure the feasibility of the study. The pilot study indicated that the questionnaire was clear and accepted. The results of the pilot study were included in the study's results as no further modifications to the questionnaire or the data collection method were done after the pilot study.

Statistical analysis: Data was analyzed by using SPSS Statistics for Windows, Version 29.0, and managed by Microsoft Office 2019. Qualitative data was presented in the form of frequency and percentage (%). The chi-square and Fisher's exact tests were used to evaluate associations between categorical variables, where appropriate. Binary logistic regression was performed to determine the independent significant predictors of good knowledge among participants. Statistical significance was determined at a 95% confidence level (i.e., differences were considered significant if P-value ≤ 0.05). There was no missing data.

RESULTS

The current study included 484 physicians from eight hospitals affiliated with the UHI system in Port Said City. Most participants were males (66.3%), had ≤5 years of experience (53.1%), had a bachelor's degree (55.4%), and did not receive any digital health training (65.7%). Most participants had internet access (99.2%) and good computer literacy (57.4%) as shown in table (1).

Table (2) demonstrates that the prevalence rates of good knowledge among physicians regarding E-health tools were low (47.5% for EHRs, 28.5% for telemedicine, and 21.9% for mobile health). Receiving training on digital health was significantly associated with good knowledge of only EHRs [OR (95%CI): 1.8 (1.2-2.7), P = 0.002] while good

Table 2: Prevalence and determinants of good knowledge of E-health tools (N=484)

Socio-demographic characteristic	Electronic health records			Telemedicine			Mobile health		
	Good N (%)	OR (CI 95%)	P-value	Good N (%)	OR (CI 95%)	P-value	Good N (%)	OR (CI 95%)	P-value
Total	200 (47.5)	-	-	138 (28.5)	-	-	106 (21.9)	-	-
Sex									
Male	150 (46.7)	1 (r) †	0.625	98 (30.5)	1 (r)	0.168	69 (21.5)	1 (	0.762
Female	80 (49.1)	1.1 (0.8- 1.6)		40 (24.5)	0.7 (0.5-1.1)		37 (22.7)	1.1 (0.7-1.7)	
Education									
Bachelor	117 (43.7)	1 (r)	0.058	72 (26.9)	1 (r)	0.371	51 (19.0)	1 (r)	0.089
Master or higher	113 (52.3)	1.4 (0.9-2)		66 (30.6)	1.2 (0.8-1.8)		55 (25.5)	0.1 (0.9-2.2)	
Digital training									
No	135 (42.5)	1 (r)	0.002	93 (29.2)	1 (r)	0.621	68 (21.4)	1 (r)	0.703
Yes	95 (57.2)	1.8 (1.2-2.7)		45 (27.1)	0.9 (0.6-1.4)		38 (22.9)	1.1 (0.7-1.7)	
Access to internet									
Don't have access	2 (50)	1 (r)	0.921 *	2 (50)	1 (r)	0.339*	1 (25)	1 (r)	0.880*
Have access	228 (47.5)	0.9 (0.1-6.5)		136 (28.3)	0.4 (0.1-2.8)		105 (21.9)	0.8 (0.1-8.2)	
Computer literacy									
Low	92 (44.7)	1 (r)	0.278	62 (30.1)	1 (r)	0.506	43 (20.9)	1 (r)	0.638
High	138 (49.6)	1.2 (0.9-1.8)		76 (27.3)	0.9 (0.6-1.3)		63 (22.7)	1.1 (0.7-1.7)	
Workplace									
Hospital 1	25 (32.1)	1 (r)	r	14 (17.9)	1 (r)	r	10 (12.8)	1 (r)	r
Hospital 2	31 (50.8)	2.2 (1.1-4.4)	0.025	18 (29.5)	1.9 (.9 -4.3)	0.108	19 (31.1)	3.1 (1.3-7.3)	0.008
Hospital 3	38 (44.2)	1.7 (0.9-3.2)	0.111	16 (18.6)	1 (0.5-2.3)	0.914	15 (17.4)	1.4 (0.6-3.4)	0.411
Hospital 4	48 (61.5)	3.4 (1.8-6.6)	<0.001	25 (32.1)	2.2 (1. -4.6)	0.042	24 (30.8)	3 (1.3-6.9)	0.007
Specialized hospitals	88 (48.6)	2 (1.1-3.5)	0.014	65 (35.9)	2.6 (1.3-4.9)	0.004	38 (21)	1.8 (0.9-3.8)	0.12
Practice									
No	17 (25.4)	1 (r)	<0.001	12 (17.9)	1 (r)	0.045	7 (1.4)	1 (r)	<0.001
Yes	213 (51.1)	4 (2.4-6.8)		126 (30.2)	1.7 (1-3)		99 (23.7)	3.9 (2.3-6.9)	
Years of experience									
≤5 years	100 (38.9)	1 (r)	<0.001	57 (22.18)	1 (r)	<0.001	42 (16.3)	1 (r)	0.002
> 5 years	130 (57.27)	2.1 (1.5-3)		81 (35.68)	1.9 (1.3-2.9)		64 (28.2)	2 (1.3-3.1)	

**Fisher exact test was used, †r: reference.*

knowledge of all E-health tools (EHRs, telemedicine, mobile health) was significantly associated with their practicing of E-health [OR (95%CI): 4 (2.4-6.8), 1.7 (1-3.1), 3.99 (2.3-6.9), P <0.001, 0.045, <0.001, respectively)], more years of experience [OR (95%CI): 2.1 (1.5-3), 1.95 (1.3-2.9), 2 (1.3-3.1), P <0.001, <0.001, 0.002 respectively]. Similarly, the workplace was a significant determinant of good knowledge of (EHRs, telemedicine, and mobile health) with varying degrees of good knowledge among different hospitals. For example, hospital 4 had the highest prevalence of good knowledge regarding EHRs [OR (95%CI): 3.4 (1.8-6.6), P <0.001].

Results of logistic regression in table (3) showed that longer duration of work experience was a common independent significant predictor of knowledge regarding EHRs, telemedicine, and mobile health (Adjusted OR (95%CI): 2.2(1.5-3.2), 1.9 (1.3-2.9), 2.2 (1.4-3.4), respectively, and p<0.001 for all of them). Also, practicing E-health was a significant independent predictor for EHRs, and mobile health (Adjusted OR (95%CI): 4.1 (2.4-7.1), 4.3 (2.4-7.5), respectively and p<0.001 for both). Receiving digital training was a significant independent predictor for EHRs only (Adjusted OR (95%CI): 1.7 (1.2-2.5), p<0.001).

Table 3: Logistic regression of the predictors of knowledge regarding electronic health. (N=484)

	Electronic health records		Telemedicine		Mobile health	
	AOR* (CI 95%)	P-value	AOR (CI 95%)	P-value	AOR (CI 95%)	P-value
Digital training						
No	1 (r) †	<0.001				
Yes	1.7 (1.2-2.5)					
Practice						
No	1 (r)	<0.001			1 (r)	<0.001
Yes	4.1 (2.4-7.1)				4.3 (2.4-7.5)	
Years of experience						
≤5 years	1 (r)	<0.001	1 (r)	<0.001	1 (r)	<0.001
> 5 years	2.2(1.5-3.2)		1.9 (1.3-2.9)		2.2 (1.4-3.4)	
Model summary						
Percent correctly predicted	63.4%		71.5%		78.1%	
P value	<0.001		<0.001		<0.001	

**AOR: Adjusted Odds Ratio, †r: reference.*

Results showed an overall high positive attitude score of E-health tools (99.6%). However, some statements as "Telemedicine can increase medical errors", and "Mobile health can give misleading information to the patient" had high agreement rates (63.2%, and 60.1%, respectively) as shown in table (4). None of the sociodemographic factors were found to be significantly associated with the attitude, so these results were not shown in tables.

Regarding the practice of E-health tools, most physicians use EHRs in the hospitals (80.6%), but other E-health tools were not adopted in the UHI hospitals. The workplace was significantly associated with the practice of EHRs (P ≤ 0.001) as shown in Table (5). No other factors were significantly associated with the practice of E-health tools

Figure (1) shows the barriers to the implementation of E-health. It indicates that the most prevalent barrier was the cost of implementation of E-health and (24%), followed by the lack of technical support (18.1%), and patient literacy (15%).

DISCUSSION

This study aimed to assess the knowledge, attitude, and practice of E-health tools among physicians working in UHI hospitals in Port Said City. Regarding knowledge, physicians showed poor knowledge of E-health (47.5% for EHRs, 28.5% for telemedicine, 21.9% for mobile health). These findings agree with previous research findings, including one study conducted in Cairo, Egypt about telehealth. This study showed that 49.1% of physicians working at primary healthcare units in Cairo were aware of telehealth, while only 29.6% of nurses were aware of telehealth.[10] A similar rate was reported by another study in Pakistan to assess the knowledge, attitude, and practice of doctors and medical students towards digital health tools. It showed that only 61 (27.3%) doctors and 48 (19.4%) students were aware of its medical applications.[17] A higher knowledge level was reported by an online survey conducted by the Council for Cardiology Practice of the European Society of Cardiology (ESC). It revealed that 57% of physicians had a fair knowledge of DH.[1] This disagreement in the level of knowledge could be attributed to the differences in the settings of the study where limited resources as in Egypt and Pakistan, may hinder adopting such applications.

Regarding the determinants of Knowledge of E-health among physicians, the current study results showed that good knowledge of EHRs was positively associated with receiving training on digital health, practicing E-health and higher years of experience [P < 0.001]. Also, longer duration of work experience was a common determinant of good knowledge regarding m-Health and telemedicine. These results agree with findings from other studies conducted in Nigeria and Bangladesh.[2,11] These determinants indicate that knowledge is the natural outcome of training, practicing, and prolonged exposure to these tools. So, differential and non-uniform training courses offered to physicians working in the UHI

Table 4: Attitude towards E-health tools (N=484)

The statements	Strongly disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly agree n (%)
Telemedicine can facilitate diagnosis and treatment	33 (6.8)	105 (21.7)	116 (24)	137 (28.4)	92 (19)
Telemedicine services are important for remote-deprived areas	16 (3.3)	28 (5.8)	79 (16.4)	210 (43.5)	150 (31.1)
Telemedicine services can increase medical errors	15 (3.1)	55 (11.4)	108 (22.4)	182 (37.7)	123 (25.5)
Telemedicine services can endanger patient privacy	21 (4.3)	132 (27.3)	110 (22.8)	150 (31.1)	70 (14.5)
Electronic health records allow me to deliver better patient care	14 (2.9)	25 (5.2)	78 (16.1)	207 (42.9)	159 (32.9)
Electronic health records increase my practice productivity	14 (2.9)	61 (12.6)	92 (19.0)	177 (36.6)	139 (28.8)
Electronic health records have a negative effect on the doctor-patient relationship	28 (5.8)	71 (14.7)	129 (26.7)	196 (40.6)	59 (12.2)
Electronic health records increase the burden on physicians	30 (6.2)	100 (20.7)	124 (25.7)	134 (27.7)	95 (19.7)
Mobile Health apps will enhance patient's adherence to treatment	23 (4.8)	63 (13.0)	148 (30.6)	181 (37.5)	68 (14.1)
Mobile Health apps can be used in health promotion (Increasing awareness of healthy behaviors)	10 (2.1)	29 (6.0)	91 (18.8)	238 (49.3)	115 (23.8)
Mobile Health apps can give misleading information to the patient	15 (3.1)	41 (8.5)	137 (28.4)	239 (49.5)	51 (10.6)

Overall positive attitude: 99.6%

hospitals may be the reason why physicians at some hospitals had a higher knowledge than others with significant differences as shown in the bivariate analysis.

Most physicians showed positive attitudes towards E-health (99.6%). High levels of positive attitudes have been consistently reported by other studies. For example, a study conducted at the Lagos University Teaching Hospital, Nigeria, reported that all doctors (100%) had a positive attitude towards electronic medical records (EMRs) and 96.54% were willing to use EMRs.[11] Also, another online survey study, conducted in Syria, showed that 87.4% of doctors and medical students agreed on the importance of digital health tools in medical practice. [19] Similarly, a national study in Singapore showed that the majority (88.8%) of radiology residents and faculty radiologists agreed that digital health tools in radiology would drastically change radiology practice and would make radiology more exciting (76.0%). [18] The advantages of adopting these tools were reported by the participants in the current study. For example, about 75.9% of participants agreed that EHRs would allow for better patient care. Using EHRs has been widely adopted in UHI hospitals and centers. That might explain the highly positive attitude towards EHRs, since physicians could evaluate their potential in patient care. Also, participants reported a positive attitude towards remote healthcare in Egypt, as 74.6% of them agreed that telemedicine was important for remote deprived areas and a similar percentage (73%) agreed that mobile health would be effective in health promotion.

The practice of E-health in UHI hospitals is high for electronic health records (80.6%), which were adopted by these hospitals, while mobile health and telemedicine were not yet adopted. This might be explained by the excessive costs of the implementation. A high practice (52.8%) of telemedicine was reported by healthcare professionals in the rural areas of Sindh, Pakistan. Telemedicine helped them deliver healthcare services through online consultations. [17] The knowledge of participants was significantly associated with the practice of EHRs. This might explain the finding that hospitals with higher practice of EHRs also had physicians with higher levels of knowledge. These findings agree with another study in which m-Health training and knowledge were significantly associated with the usage of mobile health apps ($p < 0001$).[21]

Regarding the barriers to adopting E-health, results showed that the most prevalent barriers were the cost of implementation of these tools (24%) and the lack of technical support (18.1%). The same barrier was

Table 5: Prevalence and determinants of Practice of E-health tools in hospitals (N=484)

	Using electronic health records		
	Practice N (%)	OR (CI 95%)	P-value
Total	390 (80.6)	-	-
Sex			
Male	257 (80)	1 (r) †	0.687
Female	133 (81.5)	1.1 (0.7-1.8)	
Education			
Bachelor	214 (80)	1 (r)	0.652
Master or higher	176 (81.5)	1.1 (.7-1.8)	
Received Digital training			
No	250 (79)	1 (r)	0.131
Yes	140 (84.3)	1.5 (0.9-2.4)	
Access to the internet			
Don't have access	3 (75)	1 (r)	0.777*
Have access	387 (80.6)	1.4 (0.1-13.5)	
Computer literacy			
Low	171 (83.0)	1 (r)	0.244
High	219 (78.8)	0.8 (0.5-1.2)	
Workplace			
Hospital 1	39 (50.0)	1 (r)	R
Hospital 2	52 (85.2)	5.8 (2.5-13.3)	<.001
Hospital 3	64 (74.4)	2.9 (1.5-5.6)	<.001
Hospital 4	75 (96.2)	25 (7.3-86.1)	<.001
Specialized hospitals	160 (88.4)	7.6 (4-14.4)	<.001
Years of experience			
≤5 years	207 (80.5)	1 (r)	0.98
> 5 years	183 (80.6)	1 (0.6-1.6)	

**Fisher exact test was used, †r: reference.*

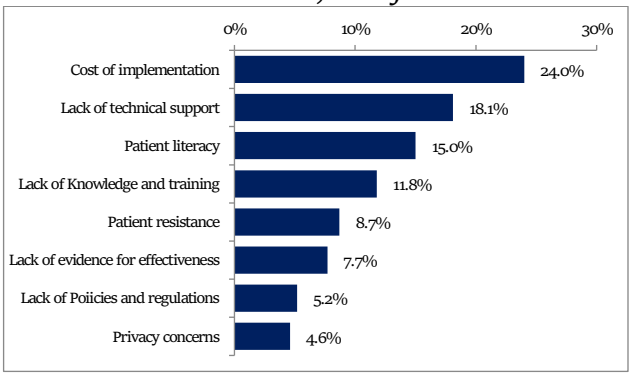

Figure 1: Barriers to the implementation of E-health (N=484)

frequently cited in previous studies in Saudi Arabia, Kenya, and Southern Ethiopia. [3, 27, 28] For example, a study conducted on pharmacists working in government hospitals in 6 counties in Kenya, showed that the most prevalent barriers to the success of an electronic pharmacovigilance reporting system were the lack and unreliability of internet access provision at the workplace (36.9% and 37.9%). [27] Also, another study conducted in Southern Ethiopia on women's health extension workers, showed that mobile network unavailability was the most important barrier to using E-health. Additionally, the lack of knowledge and training (11%) was an important barrier to implementing DH tools as reported by participants in the current study. [28] Similarly, another study conducted in Germany on m-Health found that the most significant barrier was the healthcare professionals' insufficient information regarding m-Health applications.[22] In addition, participants reported that there were some concerns related to the

patients. For example, they reported that patients' literacy (15%) and resistance (8.7%) were important barriers that should be considered for optimal application of these tools.

CONCLUSIONS

This study showed that despite the positive attitudes of most physicians participating in the study, most of them had low knowledge of E-health tools. EHRs were widely adopted and highly practiced while other tools were not yet. Digital training, practicing E-health and more years of work experience were important determinants related to the knowledge, and practice of digital health tools. Implementation of digital health tools needs further advancement in UHI hospitals. The high cost of implementation, and the lack of technical support were among of the most important barriers to implementing DH tools. The study indicates the need for providing training programs that are specially designed to target the weak points in the knowledge and practice of DH tools.

Ethical Approval

The study proposal was approved by the Institutional Research Board (IRB), Faculty of medicine, Port Said University [ERN code: MED (1/5/2023) s.no (88) PHI_005]. Data was collected according to the declaration of Helsinki. Informed consent was obtained from each participant. The right of voluntary participation was ensured for participants, and they could discontinue without giving any reason. Confidentiality of data was ensured, and the participants were aware of that.

Study limitations: This study is a cross-sectional study, so it has the inherent limitations of this type of study. Also, knowledge of E-health was self-reported, and no attempt was made to assess it objectively. Using a convenient sampling technique is another limitation. Additionally, the high nonresponse rate may introduce selection bias into the study which may affect validity of the results. However, increasing the sample size in the current study may have mitigated some of the nonresponse bias.

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Author contributions: MA: Idea and the design of the work, analysis, interpretation of data, drafting of the manuscript, and substantive revision. AA: design of the work, analysis, and drafting of the manuscript. NA: design of the work and drafting of the manuscript. MM: design of the work and the manuscript's substantive revision. NS: design of the work, the interpretation of data, drafting of the manuscript, and substantive revision. All authors read and approved the final manuscript.

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