

Clinical training and practice of using digital health solutions among healthcare workers in clinical settings during Hajj season

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Abstract

Digital health solutions are widely used in Saudi Arabia, but training, clinical practice and challenges related to using digital health applications have not been evaluated from the perspective of healthcare workers during the Hajj season in Makkah. The current study was planned to explore clinical training, practices and challenges related to the use of digital health among healthcare workers during the Hajj season from June to August 2023. Of the 470 subjects, 347(73.8%) were males and 123(26.2%) were females. The overall median age was 40 years (interquartile range: 27-56 years). In the clinical practice of using digital health, 185(39.4%) of the subjects strongly agreed that digital health was useful and beneficial during transportation difficulties, and 167(35.5%) strongly agreed that digital health applications had changed their working routine during the Hajj season. Negative outcome expectations were the challenge least reported by 72(15.3%) respondents.

Keywords: Telemedicine, Telehealth, eHealth, Virtual medicine, Respiratory therapy.

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Introduction

Despite the high demand for digital health (DH) services in clinical practice to facilitate care delivery, several barriers and challenges regarding the use of digital applications have been identified from perspectives of healthcare workers (HCWs).^{1,2} Saudi Vision 2030 enhances empowering DH services to provide high level of care to residents, travellers and pilgrims. Yearly, more than 1,300 HCWs arrive in Makkah (90% of them being Saudi nationals) to participate in providing healthcare services to pilgrims during the Hajj season.³ This is an important logistic strategy to cope with the high demand for medical services during the season. Evidence continues to emerge that using DH approaches to provide and manage health

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services is a significant factor in alleviating the pressure on healthcare systems, and facilitating control over the spread of respiratory diseases, such as the coronavirus disease-2019 (COVID-19).⁴ In Saudi Arabia, the Ministry of Health (MOH) has succeeded in optimising and maintaining a strategy to mitigate the spread of respiratory viruses during the Hajj season via different DH technologies. This strategy includes screening patients, providing daily reports about symptoms, and tracing infected cases via health innovations, such as mobile health applications (apps).

The emergence and spread of coronavirus led to a dramatic increase in the use of DH in Saudi Arabia, and overwhelmed HCWs³ owing to several challenges regarding the provision of effective DH services. It has been reported that clinicians still have low knowledge about DH and its use.⁵ A national study to evaluate perception and barriers of using a mobile health app from public's perspective.⁶ The mobile health app was perceived as reliable and easy to use. Non-users of DH reported that lack of knowledge was the most common barrier.⁶

A study explored DH use from the perspective of both HCWs and the general public using real-time data, and demonstrated that there were more than 23 million registered users across all DH platforms in Saudi Arabia.^{3,7} Despite the rapid growth in the adoption of DH in Saudi Arabia, to our knowledge, the rate of usability and the challenges faced by HCWs during the Hajj season have not been evaluated. The current study was planned to fill the gap by assessing clinical training and practice of DH among HCWs who participated in the 2023 Hajj season.

Methods and Results

The cross-sectional study was conducted during the Hajj season from June to August 2023 in Makkah. The sample was raised using convenience sampling technique. With the presumption that approximately 1,300 healthcare providers participate in the Hajj each season, and considering a confidence level of 95%, a margin of error of 4%, and an expected response rate of 55%, the study concluded that the minimum required sample size is 409. Those included were HCWs engaged in delivering health services to the pilgrims. The inclusion criteria did not specify any particular profession, making it inclusive of all healthcare roles. After obtaining the necessary ethical

approval and written consent form, the author distributed the questionnaire to collect data. The questionnaire has two domains (clinical training and practice) about DH usability. The survey was originally developed and validated by Almojaibel et al.⁸

Of the 470 Saudi nationals associated with 13 healthcare professions, 347(73.8%) were males and 123(26.2%) were females. The overall median age was 40 years (interquartile range [IQR]: 27-56 years). There were 213(45.3%) respondents who had used DH for <1 year, and 141(30%) for 1-3 years (Table 1).

Table-1: Characteristics of the participants (n=470).

Variable	n (%)	Median [IQR]
Age (years)		40 [27 to 56]
Gender		
Male	347 (73.8)	
Female	123 (26.2)	
Year of experience (category)		
<1 yr.	213 (45.3)	
1 to 3 yrs.	141 (30.0)	
4 to 6 yrs.	57 (12.0)	
7 to 9 yrs.	22 (4.7)	
≥ 10 yrs.	37 (7.9)	
Profession		
Physician	145 (30.9)	
Nurse	89 (18.9)	
Respiratory therapy	70 (14.9)	
Physiotherapy	55 (11.7)	
Pharmacy	58 (12.3)	
Radiology	13 (2.80)	
Emergency Medical Services	7 (1.50)	
Occupational therapy	5 (1.1)	
Health education	13(2.80)	
Operation room technician	2 (0.40)	
Medical Laboratory	7 (1.5)	
Biomedical Engineering	3(0.60)	
Dietitian	2(0.40)	

IQR: Interquartile range.

Table-2: Clinical training and practice of using digital health (DH) applications among the participants (n=470) [n (%)].

Items	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Clinical Training					
<i>I would like to receive more clinical training on DH</i>	149 (31.7)	176 (37.40)	60(12.8)	15 (3.27)	2 (0.40)
<i>I feel like I have been sufficiently trained to use DH effectively</i>	121 (25.7)	162 (34.5)	77 (16.4)	37 (7.9)	5 (1.10)
<i>I feel comfortable training patients on how to use DH systems independently.</i>	129 (27.4)	180 (38.3)	63 (13.4)	27 (5.7)	3 (0.60)
<i>I feel comfortable to train peers and colleagues on using DH</i>	147 (31.30)	164 (34.9)	64 (13.60)	23 (4.90)	4 (0.90)
Clinical Practice					
<i>The use of DH changed my working routine</i>	137 (29.1)	167 (35.5)	69 (14.7)	25(5.3)	4 (0.90)
<i>The use of DH enables me to have quicker access to patient information</i>	153 (32.6)	166 (35.3)	69 (13.8)	16(3.4)	2 (0.40)
<i>Everyone in my workplace uses DH</i>	115 (24.5)	104 (22.1)	96 (20.4)	75(16.0)	12 (2.6)
<i>DH is useful for patients with transportation barriers</i>	185 (39.4)	158 (33.6)	52 (11.1)	5 (1.1)	2 (0.40)
<i>Based on my experience, patients accept DH</i>	110 (23.4)	161(34.3)	104 (22.1)	22 (4.7)	5 (1.1)
<i>Based on my experience, patients like using DH</i>	100 (21.3)	152 (32.3)	122 (26.0)	22 (4.7)	6 (1.3)
<i>If I were a patient, I would like to use DH</i>	147 (31.3)	152 (32.3)	69 (14.7)	28 (6.00)	6 (1.3)

There were 149(31.7%) and 176(37.4%) HCWs who strongly agreed and agreed with the proposition that they needed more clinical training on DH. Additionally, 164(34.9%) HCWs expressed comfort in training their peers on the use of DH in the clinical environment.

Further, 185(39.4%) HCWs strongly agreed that DH was useful and beneficial during transportation difficulties, and 167(35.5%) strongly agreed that DH apps had changed their working routine. There were 75(16%) HCWs who disagreed with the statement, "Everyone at my workplace uses DH".

There was a variety of challenges reported with respect to DH practice in clinical settings. Poor internet connection was reported by 174(37%), followed by lack of knowledge 152(32.3%), and the lack of time to use DH 149(31.7%). Negative outcome expectations were the challenge least reported 72(15.3%) respondents.

Discussion

The current study indicated that the practice of using DH during the Haj season is improving following the strategic MOH plan in Saudi Arabia to fully operate the DH services as an alternative to either providing healthcare or monitoring patients.^{3,6,7} At the clinical practice level, promoting DH use allows and accelerate accessibility to healthcare services, especially when the Haj season is hosting millions of people.⁹ At the public health level, this is crucial as transportation during the Haj season across Makkah is mostly limited. The current results showed that perceptions of HCWs about DH benefits in the clinical practice were promising, and were getting more attention compared to earlier findings.^{2,6}

The current results showed that DH expedited the pace of routine work and most HCWs felt adequately trained in using DH in a clinical setting, feeling confident about using DH for their patients during the Haj season. Previous studies showed that training and confidence were

important elements to improve acceptance and adoption of DH apps in routine clinical practice.^{10,11} The variety in DH use across health-related professions might be connected to the nature of the clinical practice itself.¹² On the other hand, DH apps are not necessarily a favourable approach, particularly with critical patients or emergency operations where hands-on workload is routine.¹³

The current study identified poor internet connection, lack of knowledge, and lack of time as the most frequent challenges in the way of adopting DH by HCWs during the Haj season. As reported earlier, technical issues and low knowledge are commonly associated with low levels of utilisation and satisfaction.^{6,14}

The current study has limitations as it was a short-term study which was unable to determine associated factors of DH usability during the Haj season. There is a need for long-term comprehensive, multi-centre studies in Saudi Arabia to delve deeper into the factors related to DH usability.

Conclusion

HCWs during the Haj season had been trained on using DH to attend to the pilgrims. DH was perceived as beneficial for facilitating care delivery and improving patient care by the HCWs. Challenges to using DH were also identified, with poor internet connection being the most often reported.

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SMA: Final approval and agreement to be accountable for all aspects of the work.