

Access this article online

Quick Response Code:



Website:

www.jehp.net

DOI:

10.4103/jehp.jehp_819_22

Awareness and acceptance of teleclinic services during COVID-19 in the general population in Riyadh: Cross-sectional study

Hayat S. Alzahrani, Sarah A. Alharbi¹, Yara I. Alsadan¹, Nouf S. Alghosn¹, Sarah M. Almazyad¹, Nowayer Alotaibi¹, Mohammed Almansour², Khaled K. Aldossari³, Eyad Demyati⁴, Razan Y. Abulreesh¹

Department of Clinical Science, College of Medicine, Princess Nourah bint Abdulrahman University, Riyadh, Saudi Arabia, ¹Princess Nourah bint Abdulrahman University, Riyadh, Saudi Arabia, ²Department of Medical Education, College of Medicine, King Saud University, Riyadh, Saudi Arabia, ³Family and Community Medicine Department, College of Medicine, Prince Sattam Bin Abdulaziz University, Al-Kharj, Saudi Arabia, ⁴Consultant in Family Medicine and Community Health Services Department, King Abdullah Bin Abdulaziz University Hospital, Princess Nourah bint Abdulrahman University, Riyadh, Saudi Arabia

Address for correspondence:

Dr. Hayat S. Alzahrani, MBBS, SBFM, ABFM, MedEd (CA), Assistant Professor/Consultant, Family Medicine and Medical Education, Princess Nourah bint Abdulrahman University, Postal Code 11671, P.O. Box: 84428, Riyadh, Saudi Arabia.
E-mail: Hsaalzahrani@pnu.edu.sa

Received: 13-06-2022
Accepted: 31-03-2023
Published: 30-06-2023

Abstract:

BACKGROUND: The first COVID-19 case in Saudi Arabia was reported on March 2, 2020. The Saudi government introduced the “937” service number as one of the telemedicine services for COVID-19 information. Telemedicine uses telecommunication and information technologies in the medical field to deliver healthcare services and improve patients' health status. This study aims to estimate the frequency of teleclinics usage during COVID-19, assess awareness of teleclinics, and assess acceptance of teleclinics during COVID-19 in the Saudi population.

MATERIALS AND METHODS: The cross-sectional study used a convenient sample encompassing the 1,583 Saudi and non-Saudi adult population of Riyadh, Saudi Arabia, and was conducted online between August 2020 and April 2021. A self-administrated online questionnaire was distributed to all participants and data were collected on sociodemographics, knowledge of use of teleclinics, and its acceptance. Analysis of quantitative data by *t*-test and association of qualitative variables by Chi-square test was conducted. Regression analysis was performed on the significant values of univariate analysis. Data were analyzed by SPSS 25.

RESULTS: Most (92.5%) participants were female and had a university education (65.9%). The main reason for using teleclinic was experiencing a new complaint (27.3%), next, for medications refill (13.2%), with COVID-19-related issues being the least common reason for using teleclinic (8.2%). The result shows that 77.1% of participants had a good level of acceptance of teleclinic. The regression analysis showed that number of teleclinics utilization, as an advantage it is more convenient, and recommending this service to someone else was significantly associated with acceptance of teleclinics in future.

CONCLUSION: As per the findings, the experience of using teleclinic positively impacts the level of acceptance of teleclinic among the population. The adoption of telemedicine for healthcare delivery during the COVID-19 pandemic helped limit the spread of the infection and reduce the risk of exposure to COVID-19 for both patients and healthcare providers. In the future, telemedicine can be used as an alternative to minor complaints and follow-up checkups. In this way, the burden of healthcare system can also be overcome.

Keywords:

Acceptance, awareness, COVID-19, teleclinic

Introduction

The World Health Organization (WHO) defined coronavirus disease (COVID-19)

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

as “an infectious disease caused by a newly discovered coronavirus. Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without special treatment. Older

How to cite this article: Alzahrani HS, Alharbi SA, Alsadan YI, Alghosn NS, Almazyad SM, Alotaibi N, *et al.* Awareness and acceptance of teleclinic services during COVID-19 in the general population in Riyadh: Cross-sectional study. J Edu Health Promot 2023;12:217.

people and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness.^[1] The first COVID-19 case in Saudi Arabia was declared by the Ministry of Health on March 2, 2020. At that time, Ministry of Health introduced an information service and recommended everyone to call “937”. This was one of the telemedicine services for individuals in case of any concerns regarding the spread of the infection.^[2]

Telemedicine uses telecommunication and information technologies in the medical field to deliver healthcare services and improve both patients’ health status and education.^[3] The adoption of telemedicine for healthcare delivery during the COVID-19 pandemic helped limit the spread of the infection and reduce the risk of exposure to COVID-19 for both patients and healthcare providers as it does not require in-person visits.^[4] Supporting that recent meta-analysis has shown that teleclinics provide a quick alternative to actual visits and it has proven its effectiveness by dispensing unnecessary clinic visits, saving time.^[5,6] There is Telehealth Pilot Program (MinuteClinic) in the United States, and there are 11 clinics in California and Texas participating in the program.^[7] Also, the Australian Government introduced a temporary telehealth scheme on March 30, 2020, responding to the COVID-19 pandemic.^[8] Similarly, teleclinics were established during the COVID-19 pandemic in Jeddah, Saudi Arabia.^[6]

Different teleclinics were established across the globe during the COVID-19 pandemic^[9] for various of clinical conditions like skin diseases,^[10] orthopedics,^[11] oncological consultation,^[12,13] elderly with chronic diseases,^[14] psychological issues,^[15] primary care,^[16] and rehabilitation services.^[17] Although individuals with the chronic disease might be preferred using telemedicine also as compared to hospital visits, to achieve this, teleclinics should be integrated after the pandemic, during disasters, and during emergencies.^[9]

However, few studies have assessed the awareness and satisfaction with teleclinics during the COVID-19 pandemic. In addition, data about the use of teleclinic services during COVID-19 are limited. One local study in Jeddah was concerned about the population’s knowledge and level of satisfaction with teleconsultation clinics showing fair results despite a small sample size.^[6] Therefore, this study aimed to explore the population’s level of awareness and acceptance of teleclinics during the COVID-19 pandemic in Riyadh, Saudi Arabia.

Materials and Methods

Study design and setting

A cross-sectional study design is used to conduct this study. Study data were collected and managed using

Research Electronic Data Capture electronic data capture tools hosted at Princess Nourah University. Research Electronic Data Capture is a secure, web-based software platform designed to support data capture for research studies, providing (1) an intuitive interface for validated data capture, (2) audit trails for tracking data manipulation and export procedures, (3) automated export procedures for seamless data downloads to common statistical packages, and (4) procedures for data integration and interoperability with external sources.^[18]

Study participants and sampling

A convenient sample of 1,583 Saudi and non-Saudi adult populations of both genders and currently residing in Riyadh were invited to participate in the study using an online questionnaire distributed through social media platforms (WhatsApp and Twitter) to explore the population’s awareness and acceptance of teleclinics practice in general during COVID-19 pandemic in Riyadh, KSA. All participants consented before enrolling in the study.

The expected level of acceptance of teleclinics is around 50%, with a margin of error of 5%, where the level of confidence is 95% ($\alpha = 0.05$), power of study of 80% ($\beta = 20\%$),

Table 1: Characteristics of study sample $n=1,583$

Item	Statistics
Age (years)	35.44±11.13
Gender*	
Female	1,463 (92.5%)
Male	118 (7.5%)
Nationality*	
Saudi	1,518 (96.1%)
Non-Saudi	62 (3.9%)
Education*	
School	421 (26.7%)
University	1,040 (65.9%)
Higher education	118 (7.5%)
Income*	
Enough	950 (60.1%)
Enough and save	418 (26.4%)
Not enough	104 (6.6%)
Not enough and in-dept	110 (7.0%)
Marital status	
Married	1,067 (67.4%)
Single	405 (25.6%)
Widow/divorced	111 (7.0%)

Values are presented as mean±standard deviation or number (%). *Missing data: 1: Income. 2: Gender. 3: Nationality. 4: Education

Table 2: Acceptance category

	Statistics	Valid percentage
No acceptance	347 (21.9%)	22.9%
Acceptance	1168 (73.8%)	77.1%
Total	1515 (95.7%)	100.0%

Values are presented as number (%)

and the minimal sample size needed for the present study is 385. We used the Raosoft to calculate the sample (the population of Riyadh, Saudi Arabia, 7387817). Because of the nature of being an online study, we increased the sample size to 1,000 to improve the power of our study.

Convenient sample

Data collection tool and technique

A validated online Arabic version of the questionnaire was distributed as the tool for data collection. Part of the questionnaire was adapted from a study in Jeddah,

Table 3: Pattern of use of teleclinic

Questions	n (%)
Did you or any of your relatives use teleclinic during COVID-19 pandemic?	
Yes, I did	711 (44.9%)
Yes, some of my relatives	377 (23.8%)
No, neither me nor any of my relatives	495 (31.3%)
How many times did you/your relatives use teleclinic?	
0	493 (31.2%)
1	421 (26.6%)
More than 1	667 (42.2%)
What method was used in your/your relatives teleclinic appointment?	
Telephone	967 (61.1%)
Video conference	40 (2.5%)
Both	106 (6.7%)
Did not use it	470 (29.7%)
For what reason did you/your relatives use teleclinic?	
New complaint	431 (27.3%)
Follow-up	204 (12.9%)
Emergency situation	160 (10.1%)
Refill medication	208 (13.2%)
COVID-19-related medical issues	129 (8.2%)
Did not use it	449 (28.4%)
What was the outcome or treatment from the teleclinic consultation?	
Reassurance and self-management	519 (32.8%)
Prescribed drugs	460 (29.1%)
Appointment	125 (7.9%)
Send ambulance	28 (1.8%)
Did not use it	448 (28.4%)
In your opinion what are the disadvantages of teleclinic?	
Poor communication	293 (18.5%)
Inadequate assessment/treatment	548 (34.6%)
patient cannot explain her/his complaint clearly	726 (45.9%)
patient cannot feel it like a real doctor	350 (22.1%)
In your opinion what are the advantages of teleclinic?	
Shorter wait/no wait	625 (39.5%)
Less chance of catching illness	543 (34.3%)
Low-cost	376 (23.8%)
Convenience	931 (58.8%)
Would you recommend teleclinic to someone else?	
Definitely	669 (42.4%)
Probably	621 (39.4%)
Not sure	287 (18.2%)

Values are presented as number (%)

Saudi Arabia.^[6] It has been piloted before using to confirm the feasibility and validity of translated sections.

The questionnaire consisted of 23 questions distributed in four domains. The first domain comprised demographic characteristics, including age, sex, nationality, and education level.

The second domain was related to the personal experience of teleclinics (number of times teleclinic services were used during the COVID-19 pandemic, the reason for the use, and the outcome). The third and fourth domains addressed participants' perspectives regarding the effectiveness of teleclinics and their acceptance of the teleclinic.

Respondents were asked to answer 'strongly agree' to 'strongly disagree' on a 5-point Likert scale. The maximum total score was 45 and the minimum total score was 9, with higher scores reflecting greater acceptance. Based on the results of this questionnaire, the participants were classified as accepting (acceptance score from 27 to 45) and nonaccepting (acceptance score from 9 to 26).

Analysis of quantitative data by *t*-test and association of qualitative variables by Chi-square test were conducted. A *P* value less than .05 was considered statistically significant. Multiple regression analysis was performed; independent variables which had *P* value ≤ 0.05 were included in the regression model for exploring the adjusted effect. Data cleaning and analysis for this study were performed using the (SPSS) v. 25.0. Descriptive statistics were used to characterize the study population.

Ethical consideration

The ethical approval was taken from Institution Review Board of Princess Nourah University (H-01-R-059). Consent was part of the questionnaire and only participants who wanted to participate in the study filled the questionnaire. However, all the information about the participants was kept anonymous.

Results

The results obtained for the demographic data are listed in Table 1. A total of 1,583 people participated in the survey; their average age was 35.44 ± 11.13 years. Most of the participants (96.1%) were Saudi nationals, 65.9% had a university education, and 92.5% were females. Approximately 60.1% of the participants declared enough income. Regarding marital status, most (67.4%) of the participants were married.

Table 2 shows the acceptance category of teleclinics among the participants. We found a high level of acceptance among the participants, 77.1%, while 22.9% did not accept teleclinics.

Participants’ personal experience of the teleclinic

Table 3 shows that almost 44.9% used the teleclinic during the COVID-19 pandemic and 23.8% know a relative who used it. Approximately 26.6% used teleclinic once, whereas 42.2% used it more than once. The main reasons for using the teleclinic were experiencing a new complaint (27.3%), medications refill (13.2%), follow-up (12.9%), emergency situation (10.1%), and COVID-19–related issues (8.2%).

The most common outcome from teleclinic was reassurance and self-management (32.8%), while sending for an ambulance (1.8%) was the least common outcome.

The results showed that more than half of the participants (58.8%) reported that convenience is the best advantage of using teleclinics, whereas almost 45.9% of them deemed that the worst disadvantage is that patients cannot explain their complaints using teleclinics.

Most of the participant’s responses to the perceptions questions were either positive or neutral, with some variations like those who agreed and strongly agreed (68.5%) because the teleclinic does not require transportation and (65.2%) showed that teleclinics are available 24/7 as a reason. On the other hand, 21.8% strongly disagreed/disagreed with the re-experiment with teleclinics in the future [Table 4].

Participants’ acceptance and perceptions regarding teleclinic use

Table 5 shows the factors affecting participants’ level of acceptance of teleclinics. A significant association was

observed between acceptance levels and the number of times using teleclinic ($P=0.011$), whereby the more people used teleclinics, the more they were likely to report higher acceptance levels.

The result also showed a significant association between participants’ level of acceptance of teleclinic and using it for new complaints ($P = .048$). Searching for reassurance and self-management or prescription of medications as an outcome were significantly associated with participants’ acceptance of teleclinic use ($P = 0.036$). The advantages of convincing and decreased chance of catching illness were significantly associated with positive acceptance of teleclinic use $P < .001$ and $P=0.025$, respectively. On the other hand, the disadvantages of cannot be feeling it like a real doctor, cannot explain his/her complaint clearly, and having poor network connection also significantly associated with participants’ acceptance of teleclinic use with P values of $< .001$, $.014$, and $.020$, respectively. Finally, a significant number of participants who positively answered the question regarding their behavior of recommending teleclinic to others accepted its use ($P < .001$).

Table 6 showed regression analysis. The overall regression model was significant ($P < .0001$). The regression analysis showed that the more the number of times patient used teleclinics, the more they were likely to accept this service and use again in future ($P = 0.05$, confidence interval 95% -0.069 to 0.001). Likewise, among several disadvantages patients cannot feel it like a real doctor had significantly association with acceptance of this service ($P = 0.03$). Whereas the patient’s

Table 4: Acceptance of teleclinic

	1 (Strongly disagree)	2 (Disagree)	3 (Not sure)	4 (Agree)	5 (Strongly agree)	Total n (%)
I think I can easily explain my medical problem to the doctor on the phone.	111 (7.0%)	145 (9.2%)	434 (27.5%)	684 (43.3%)	206 (13.0%)	1,580 (100%)
I believe the doctor can understand my medical problem on the phone.	101 (6.4%)	172 (10.9%)	576 (36.5%)	598 (37.9%)	131 (8.3%)	1,578 (100%)
I am confident that the doctor can provide an appropriate management plan via phone consultation.	96 (6.1%)	126 (8.0%)	546 (34.8%)	642 (41.0%)	157 (10.0%)	1,567 (100%)
I believe the doctor will tell me everything about my treatment via phone consultation.	101 (6.4%)	161 (10.2%)	537 (34.1%)	603 (38.2%)	175 (11.1%)	1,577 (100%)
I think I will be able to understand my illness much better after the phone consultation.	115 (7.3%)	173 (11.0%)	537 (34.2%)	594 (37.8%)	151 (9.6%)	1,570 (100%)
I think I am more comfortable to tell the doctor about some private or personal information than face-face appointment.	129 (8.2%)	191 (12.2%)	338 (21.5%)	649 (41.3%)	265 (16.9%)	1,572 (100%)
I think teleclinic provides medical services at my preferred time 24/7.	95 (6.1%)	119 (7.6%)	332 (21.1%)	677 (43.1%)	347 (22.1%)	1,570 (100%)
I think teleclinic provides good medical service that does not require transportation.	83 (5.3%)	117 (7.4%)	298 (18.9%)	710 (45.1%)	368 (23.4%)	1,576 (100%)
I would like to use teleclinic again in the future after COVID-19 pandemic.	161 (10.2%)	184 (11.6%)	376 (23.8%)	553 (35.0%)	306 (19.4%)	1,580 (100%)

Values are presented as number (%)

Table 5: Factors affecting participants' level of acceptance of teleclinic

Characteristic	Acceptance	No acceptance	P
Gender			0.093
Female	1,085 (92.9%)	311 (90.1%)	
Male	83 (7.1%)	34 (9.9%)	
Nationality			0.913
Saudi	1,122 (96.1%)	330 (95.9%)	
Non-Saudi	46 (3.9%)	14 (4.1%)	
Education			0.656
School	296 (25.4%)	96 (27.8%)	
University	780 (66.9%)	224 (64.9%)	
Higher education	90 (7.7%)	25 (7.2%)	
Income			0.514
Enough	703 (60.2%)	207 (59.8%)	
Enough and save	317 (27.1%)	88 (25.4%)	
Not enough	69 (5.9%)	28 (8.1%)	
Not enough and in-dept	79 (6.8%)	23 (6.6%)	
Marital status			0.365
Married	787 (67.4%)	234 (67.4%)	
Single	309 (26.5%)	85 (24.5%)	
Widow/divorced	72 (6.1%)	28 (8.1%)	
How many times did you/ your relatives used teleclinic			0.011
0	347 (29.7%)	130 (37.6%)	
1	307 (26.3%)	91 (26.3%)	
More than 1	513 (44.0%)	125 (36.1%)	
What method was used in your/your relatives teleclinic appointment			0.053
Telephone	726 (62.2%)	192 (55.3%)	
Video conference	29 (2.5%)	9 (2.6%)	
Both	82 (7.0%)	21 (6.1%)	
For what reason did you/ your relatives use teleclinic			0.048
New complaint	331 (28.4%)	79 (22.8%)	
Follow-up	139 (11.9%)	52 (15.0%)	
Emergency situation	127 (10.9%)	28 (8.1%)	
Refill medication	148 (12.7%)	47 (13.5%)	
COVID-19-related medical issues	100 (8.6%)	25 (7.2%)	
What was the outcome or treatment from the teleclinic consultation			0.036
Reassurance and self-management	393 (33.7%)	100 (28.9%)	
Prescribed drugs	346 (29.6%)	91 (26.3%)	
Appointment	83 (7.1%)	34 (9.8%)	
Send ambulance	24 (2.1%)	4 (1.2%)	
In your opinion what are the disadvantages of teleclinic			0.020
Poor network	229 (19.6%)	49 (14.1%)	
Inadequate assessment/ treatment	409 (35.0%)	120 (34.6%)	0.881
Patient cannot explain his complaint	518 (44.3%)	180 (51.9%)	0.014
Patient cannot feel it like real doctor	225 (19.3%)	107 (30.8%)	<0.001

Table 5: Contd...

Characteristic	Acceptance	No acceptance	P
In your opinion what are the advantages of teleclinic			
Shorter wait/no wait	476 (40.8%)	130 (37.5%)	0.272
Less chance of catching illness	416 (35.6%)	101 (29.1%)	0.025
Low cost	288 (24.7%)	80 (23.1%)	0.541
Convenience	730 (62.5%)	164 (47.3%)	<0.001
Would you recommend teleclinic to someone else			<0.001
Definitely	555 (47.7%)	77 (22.2%)	
Probably	475 (40.8%)	127 (36.6%)	
Not sure	133 (11.4%)	143 (41.2%)	

convenience as an advantage had significantly higher odds of accepting this service in future again ($P < .0001$, confidence interval 95% 0.03-0.112). Recommending this service to someone else had also been significantly associated with acceptance of teleclinics in future ($P < .0001$).

Discussion

Our study aimed to explore the awareness and acceptance of teleclinics during the COVID-19 pandemic in Riyadh, KSA. The demographic data show that majority of the participants were females. The level of acceptance was high among the study sample. The level of acceptance was about 77.1%, which is nearly similar to two local studies by Magadmi, Kamel,^[6] and Nasser.^[19] An Australian study estimated that there is no association between the degree of acceptance and the teleclinic methods.^[20] However, our study shows a higher level of acceptance of telephone use than videoconference. However, we also find contrasting results; a study published in 2018 reported that videoconference is better.^[21]

The result shows that almost 44.9% used the teleclinic during the COVID-19 pandemic and 23.8% know a relative who used it. Approximately 26.6% used teleclinic once, whereas 42.2% used it more than once. This could be explained, to some extent, by the reported outcomes from their appointments and the level of education as 65.9% have university study in accordance with another study by Alharbi and Aldosari,^[22] where mostly reported outcome from teleclinic was reassurance and self-management (32.8%). Also, it could be explained by the convenience that teleclinic provides as the results showed that more than half of the participants (58.8%) reported that convenience is the best advantage of using teleclinic. However, there is a scarcity of publications about the availability of teleclinics of various specialities and a lack of physician knowledge of teleclinics.^[23]

The level of acceptance, in general, was significantly related to how often the participant used teleclinic and

Contd...

Table 6: Multiple regression analysis

	Coefficients	Standard error	t Stat	P	Lower 95%	Upper 95%
How many times did you/your relatives used teleclinic	-0.034	0.017	-1.89	0.058	-0.069	0.001
For what reason did you/your relatives use teleclinic	0.013	0.007	1.86	0.062	-0.0001	0.028
What was the outcome or treatment from the teleclinic consultation	-0.01	0.01	-0.97	0.331	-0.03	0.01
Disadvantage: Poor network	-0.014	0.027	-0.53	0.592	-0.068	0.039
Disadvantage: Patient cannot explain his complaint	-0.034	0.021	-1.62	0.104	-0.076	0.007
Disadvantage: Patient cannot feel it like real doctor	-0.074	0.025	-2.95	0.003	-0.124	-0.025
Advantage: Less chance of catching illness	-0.004	0.021	-0.19	0.845	-0.046	0.037
Advantage: Convenience	0.071	0.020	3.43	0.0001	0.03	0.112
Would you recommend teleclinic to someone else	-0.161	0.014	-11.07	0.0001	-0.190	-0.133

to the new complaint as a reason for using teleclinic. This might be due to past effective experience. The reasons for service nonacceptance identified by this study were that the patient might not clearly explain his/her complaint to the doctor and inadequate assessment and treatment. However, participants in this study were also more likely to use the teleclinic again after the COVID-19 pandemic. Similarly, a study conducted to test the effectiveness of teleclinics for diabetic patients at King Salman Hospital in Riyadh found that most participants recommended making teleclinics an available option after the COVID-19 pandemic.^[22] Another study by Zahoor A. *et al.*^[24] found that patients would like to use teleclinic again.

Our study is unique in a sense that it was conducted in large governorate of KSA, which is also a business hub and have a diverse population. We also included large sample size and check the level of awareness and acceptance of teleclinics during peak time of COVID-19.

Limitation and recommendation

There are some limitations of the study that are worth mentioning. First, the study was cross-sectional in nature and conducted online. Our online questionnaire might also expose our study to some sort of selection bias in selecting our participants. However, we distributed our online questionnaire through different social media platforms to reach the maximum number of people from different categories. Second, we only include participants residing in Riyadh; therefore, we can not generalize our results to the whole Saudi Arabia. It is recommended that future studies include more diverse participant samples when assessing patient acceptance of teleclinic service.

Conclusion

This study indicates a good level of awareness and acceptance of teleclinics among the population in Riyadh during the COVID-19 pandemic. As per the findings, it was clear that the experience of using teleclinics positively impacted the level of acceptance of teleclinics among the population. In the future, telemedicine can be

used as an alternative to minor complaints and follow-up checkups. In this way, the burden of the healthcare system can also be overcome.

Acknowledgments

The research was funded by the Deanship of Scientific Research at Princess Nourah bint Abdulrahman University, Riyadh, Saudi Arabia, through the Fast-track Research Funding Program.

Author contributions

All authors read and approved the final manuscript.

Informed consent

Written and oral informed consent was obtained from all individual participants included in the study.

Data and materials availability

All data associated with this study are present in the paper.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. World Health Organization. Coronavirus disease (COVID-19) 2021. Available from: https://www.who.int/health-topics/coronavirus#tab=tab_1.
2. Al-Rayes SA, Alumran A, Aljabri D, Aljaffary A, Aldoukhi E, Alahmedalyousif Z, *et al.* Public awareness and utilization of 937-telephone health services in the Kingdom of Saudi Arabia before and during the COVID-19 pandemic: Longitudinal study. *J Med Internet Res* 2021;23:e27618.
3. Jung S-G, Kweon H-J, Kim E-T, Kim S-A, Choi J-K, Cho D-Y. Preference and awareness of telemedicine in primary care patients. *Korean J Fam Med* 2012;33:25-33.
4. Calton B, Abedini N, Fratkin M. Telemedicine in the time of coronavirus. *J Pain Symptom Manag* 2020;60:e12-4. doi: 10.1016/j.jpainsymman. 2020.03.019.
5. Smith AC, Thomas E, Snoswell CL, Haydon H, Mehrotra A, Clemensen J, *et al.* Telehealth for global emergencies: Implications for coronavirus disease 2019 (COVID-19). *J Telemed Telecare* 2020;26:309-13.

6. Magadmi MM, Kamel FO, Magadmi RM. Patients' perceptions and satisfaction regarding teleconsultations during the COVID-19 pandemic in Jeddah, Saudi Arabia. *J Pharm Res Int* 2022;34:15-27.
7. Polinski JM, Barker T, Gagliano N, Sussman A, Brennan TA, Shrank WH. Patients' satisfaction with and preference for telehealth visits. *J Gen Intern Med* 2016;31:269-75.
8. Ramaswamy A, Yu M, Drangsholt S, Ng E, Culligan PJ, Schlegel PN, *et al.* Patient satisfaction with telemedicine during the COVID-19 pandemic: Retrospective cohort study. *J Med Internet Res* 2020;22:e20786. doi: 10.2196/20786.
9. Latifi R, Doarn CR. Perspective on COVID-19: Finally, telemedicine at center stage. *Telemed J E Health* 2020;26:1106-9.
10. Villani A, Scalvenzi M, Fabbrocini G. Teledermatology: A useful tool to fight COVID-19. *J Dermatolog Treat* 2020;31:325.
11. Parisien RL, Shin M, Constant M, Saltzman BM, Li X, Levine WN, *et al.* Telehealth utilization in response to the novel coronavirus (COVID-19) pandemic in orthopaedic surgery. *J Am Acad Orthop Surg* 2020;28:e487-92.
12. Connor MJ, Winkler M, Miah S. COVID-19 pandemic—is virtual urology clinic the answer to keeping the cancer pathway moving? *BJU Int* 2020;125:E3-4.
13. Gachabayov M, Da Dong X, Latifi R, Bergamaschi R. Considerations on colorectal cancer care in a COVID-19 pandemic epicenter. *Surg Technol Int* 2020;36:148-9.
14. Chen Q, Liang M, Li Y, Guo J, Fei D, Wang L, *et al.* Mental health care for medical staff in China during the COVID-19 outbreak. *Lancet Psychiatry* 2020;7:e15-6.
15. Huang S, Xiao Y, Yan L, Deng J, He M, Lu J, *et al.* Implications for online management: Two cases with COVID-19. *Telemed J E Health* 2020;26:487-94.
16. Greenhalgh T, Koh GCH, Car J. Covid-19: A remote assessment in primary care. *BMJ* 2020;368:m1182. doi: 10.1136/bmj.m1182.
17. Ullah S, Maghazil AM, Qureshi AZ, Tantawy S, Moukais IS, Aldajani AA. Knowledge and attitudes of rehabilitation professional toward telerehabilitation in Saudi Arabia: A cross-sectional survey. *Telemed J E Health* 2021;27:587-91.
18. Patridge EF, Bardyn TP. Research electronic data capture (REDCap). *J Med Libr Assoc* 2018;106:142.
19. Nasser AA, Alzahrani RM, Fella CA, Jreash DM, Almuwallad NTA, Bakulka DSA, *et al.* Measuring the patients' satisfaction about telemedicine used in Saudi Arabia during COVID-19 pandemic. *Cureus* 2021;13:e13382. doi: 10.7759/cureus.13382.
20. Isautier JMJ, Copp T, Ayre J, Cvejic E, Meyerowitz-Katz G, Batcup C, *et al.* People's experiences and satisfaction with telehealth during the COVID-19 pandemic in Australia: Cross-sectional survey study. *J Med Internet Res* 2020;22:e24531. doi: 10.2196/24531.
21. Rush KL, Howlett L, Munro A, Burton L. Videoconference compared to telephone in healthcare delivery: A systematic review. *Int J Med Inform* 2018;118:44-53.
22. Alharbi KG, Aldosari MN, Alhassan AM, Alshallal KA, Altamimi AM, Altulaihi BA. Patient satisfaction with virtual clinic during Coronavirus disease (COVID-19) pandemic in primary healthcare, Riyadh, Saudi Arabia. *J Family Community Med* 2021;28:48-54.
23. Alshahrani A, Stewart D, MacLure K. A systematic review of the adoption and acceptance of eHealth in Saudi Arabia: Views of multiple stakeholders. *Int J Med Inform* 2019;128:7-17.
24. Zahoor A, Fatima T, Khan AZ, Mumtaz H, Shafiq H, Naz S, *et al.* Awareness of telemedicine during COVID 19. *J Comm Med Pub Health Rep* 2020;1.