Original Article

Patients' perceptions of telehealth video visits experience in primary healthcare setting, Saudi Arabia

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Abstract

Background: The widespread utilization of telehealth recently in Saudi Arabia is unprepared and may have a remarkable adverse effect on healthcare delivery. The study aimed to investigate attitude, satisfaction, and barriers of telehealth application among patients. **Materials and Methods:** A cross-sectional study was conducted at primary healthcare centers during the period of December 2021–January 2022. All Saudi patients (≥18 years) who were treated through telehealth programs in specialized polyclinic were eligible for study inclusion. A self-administered questionnaire was utilized and consists of four main parts: personal information, history of using telehealth, assessment of satisfaction with telehealth program, and attitude toward telemedicine. **Results:** A total of 641 participants were included. Females represented 57.3% of them. A majority (82.7%) of patients were satisfied with telemedicine services. Multivariate logistic regression analysis revealed that Bachelor/postgraduates were more likely to be satisfied with telemedicine services ($P < 0.001$), whereas patients reported no appointment slot in the clinic were less likely to be satisfied with telemedicine services ($P = 0.042$). A majority of patients (84.1%) expressed positive attitude toward telemedicine services. Multivariate logistic regression analysis revealed that older patients ($P = 0.002$) and widowed ($P = 0.001$) were less likely to have positive attitude toward utilization of telemedicine services, whereas Bachelor/postgraduates ($P = 0.038$) and patients with more than this time were more likely to have positive attitude toward telemedicine services ($P = 0.001$). **Conclusion:** Patients were overall satisfied and expressed positive attitude concerning the service of telemedicine consultation. However, more in-depth investigation is recommended to better understand the predictors of satisfaction with telemedicine and barriers for its proper application.

Keywords: Attitude, barriers, primary healthcare, satisfaction, Saudi Arabia, telemedicine

Introduction

Telehealth is defined by the World Health Organization (WHO) as "the delivery and facilitation of medical and health-related services via telecommunications and digital communications technologies."[1]

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In the United States of America, about a fourth of patients lack primary healthcare providers. Therefore, telehealth services facilitate those patients to access care; however, their satisfaction with patients in telehealth is not evident.[2]

Shortly after discovering the first case of coronavirus disease (COVID-19) in the Kingdom of Saudi Arabia (KSA) on March 2, 2020,[3] the Saudi government applied a complete curfew for 24 hours in Jeddah, as one of the highly affected cities. Also, the Ministry of Health (MOH), as well as several private hospitals, has initiated teleconsultation services to provide health care to patients at their homes.[4]

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The widespread utilization of telehealth recently in the Kingdom of Saudi Arabia was unprepared and may have a remarkable adverse effect on healthcare delivery.[5] Telehealth has not commonly been evaluated in disastrous situations. It represented a considerable component of the medical services during the curfew of COVID-19 through delivering services at home through remote communication to minimize the risk of infection transmission.[6]

The National Guard hospital and its primary healthcare centers are one of the healthcare providers in Saudi Arabia, which adopted the Telehealth system to provide the best care to all visitors, and we noticed, during the COVID-19 pandemic, rapid adoption of Telemedicine over traditional in-person visits due to social restrictions.[7] Indeed, in any new emerging system, there are some difficulties or barriers that will face the provider and the customers. As we know that Telemedicine increases access to different healthcare services, delivers care to rural areas, offers providers greater flexibility in scheduling, and saves patients' time and money in seeking care.[8]

It is shown in a study conducted in the United States (US) that delivering care through telemedicine saved the patient an average of 145 miles (233 km) and 142 minutes per visit.[9] Barriers to Telemedicine are many, but as shown in several international studies that one of the main barriers is computer or e-health literacy.[10,11] Also, telehealth application obstacles include the inability to perform comprehensive physical examinations, technical problems in application, security issues, and regulatory barriers.[12]

Furthermore, telehealth has some disadvantages, including its adverse impact on the continuity of care, as online interactions may not be helpful as the healthcare providers cannot benefit from a complete history and physical examination to help in diagnosis and treatment.[12,13] Telehealth can be considered a supplement to in-person visits, even though face to face method is essential in some occasions where auscultations and/or (this is informal, we chose or/and) palpation are needed.[12,13] The fast expansion of telehealth during the COVID-19 pandemic, in particular, necessitates exploring the satisfaction of patients and identifying the barriers facing its proper application.

Telehealth presents a fundamental tool for improving the quality and safety of health care, and physicians should actively use these systems to achieve the benefits. Therefore, identifying their satisfaction, attitude, and specifying barriers for implementation is a must.

Materials and Methods

Study design

A cross-sectional study was carried out.

Study setting

The study was carried out in Jeddah city, Saudi Arabia, which is the second-largest city in Saudi Arabia after the capital Riyadh. The study was implemented specifically at primary healthcare centers in King Abdual Aziz Medical City-Jeddah region (Specialized poly clinic, Bahrah center, Iskan Jeddah center).

Study duration

The study was conducted over a period of 2 months (December 2021–January 2022).

Study participants

All Saudi patients who were treated through telehealth programs of King Abdual Aziz Medical City-Jeddah in specialized poly clinic from December 2021 to May 2022 were eligible for study inclusion, provided that they aged ≥18 years.

Sample size and sampling

Using the Raosoft online sample size calculator, the sample size was calculated on assumption that the total population of patients with telehealth visits in two months was approximately 3840, the prevalence of using telehealth during COVID-19 pandemic is 50%, 95% confidence interval, and 5% acceptable errors, the sample was 641.

The patients were selected consequently using nonrandomized convenience sampling technique till we reached the required sample size.

Data collection

A self-administered questionnaire was utilized in this study. It consists of four main parts:

- Personal information (age, gender, and nationality)
- Previous history of using telehealth
- Assessment of satisfaction with telehealth program through eight statements with a 5-point Likert scale ranged from very satisfied to very dissatisfied (Ease of registration/scheduling, quality of the visual image, quality of the audio sound, ability to talk freely over telemedicine, ability to understand the recommendations or diagnosis made, the comfort of the telemedicine suite (the location where care received care), the overall quality of care provided, and overall telemedicine. Total score and its percentage were computed. Patients scored 60% or less were considered dissatisfied, whereas those scored over 60% were considered satisfied.
- The participants' attitude toward telemedicine: multiple choice 11 statements were used. Responses were scored in the way that the higher the score, the more positive the attitude and vice versa. Total score and its percentage were computed for each patient. Patients scored 60% or less were considered having negative attitude, whereas those scored over 60% were considered having positive attitude.

The data were collected through interview phone calls with the participants by the researcher. The researcher explained the purpose of the study to all patients before starting data collection.

Ethical issues

Written permission from authority to conduct the research was requested. Additionally, approval from Regional Research and Ethics Committee in NGH was obtained. Ethical considerations were taken through all research steps. Electronic consent was taken from healthcare providers involved in the research. Confidentiality of client's personal information was assured, and that the information will be used only for research purpose.

Data analysis

The data were collected and verified by hand then coded before computerized data entry. The statistical Package for Social Sciences (SPSS) software version 26.0 was used for data entry and analysis. Continues variables were presented as mean and standard deviation. Categorical variables were presented as frequency and percentage. Chi-square test and multivariate logistic regression (expressed as odds ratio "OR" and 95% confidence interval "CI") were used as indicated, and *P* value <0.05 was considered significant.

Results

A total of 641 participants were included in the study. Table 1 summarizes their personal characteristics. Females represented 57.3% of them. The age of 39.3% ranged between 36 and 45 years, whereas that of 38.8% ranged between 18 and 35 years. Most of them (63.8%) were married. Almost one-third (36.8%) were Bachelor/postgraduate holders and 30.9% were military employees.

Table 1: Personal characteristics of the participants (*n*=641)

	Frequency	Percentage
Gender		
Male	274	42.7
Female	367	57.3
Age (years)		
18-35	249	38.8
36-45	252	39.3
>45	140	21.8
Marital status		
Single	132	20.6
Married	409	63.8
Divorced	62	9.7
Widowed	38	5.9
Marital status		
Single	132	20.6
Married	409	63.8
Divorced	62	9.7
Widowed	38	5.9
Educational level		
Illiterate	32	5.0
Read and write	30	4.7
Primary/intermediate schools	48	7.5
High school	227	35.4
Diploma	68	10.6
Bachelor/postgraduate	236	36.8
Occupation		
Unemployed/house wife	179	27.9
Civilian employee	125	19.5
Military employee	198	30.9
Student	78	12.2
Retired	61	9.5

Experience with telemedicine

About one-third of the patients (30.4%) reported medical advice, whereas 21.4% reported lab request as reasons for telemedicine consultation as shown in Figure 1. A considerable proportion of them (40.1%) reported that this was their send experience with telemedicine consultation, whereas 31.7% reported that it was the first one [Figure 2].

Patients' satisfaction with telemedicine consultation services

Most of patients described the performance of the physicians and nurses as excellent (35.3% and 34.8%, respectively) or very good (45.6% and 47%, respectively). Also, most of the patients regarded registration/scheduling as excellent (36.7%) or very good (45.1%). Regarding the ability to understand the recommendations or diagnosis made, 24.3% and 51.2% of patients described it as excellent or very good, respectively. The overall quality of care provided was described as excellent by 27.9% and as very good by 54.8% of them, whereas the overall telemedicine experience was described as excellent by 42.9% and very good by 44% of patients Table 2.

Overall, majority (82.7%) of patients were satisfied with telemedicine services during COVID-19 pandemic as displayed in Figure 3.

Younger patients (18-35 years) were more likely to be satisfied with telemedicine services as compared to those aged over 45 years (88% vs. 68.6%), $P < 0.001$. Majority of bachelor/postgraduate holders (91.1%) compared to 53.1% of illiterate patients were satisfied with telemedicine services, $P < 0.001$. House wives/unemployed patients were less satisfied with telemedicine services than others, especially civilian employees (75.4% vs. 86.4%). However, this was borderline insignificant, $P = 0.052$. Single patients were more satisfied

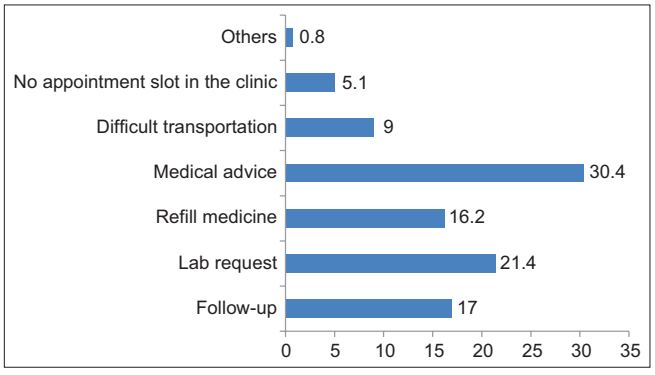

Figure 1: Reason for telemedicine consultation visits among the participants

Table 2: Patients' satisfaction with telemedicine consultation services

Telemedicine service factors	Excellent *n* (%)	Very good *n* (%)	Good *n* (%)	Poor *n* (%)	Very poor *n* (%)
Registration/scheduling	235 (36.7)	289 (45.1)	93 (14.5)	20 (3.1)	4 (0.6)
Quality of the visual image (*n*=622)	81 (13.0)	175 (28.1)	181 (29.1)	142 (22.8)	43 (6.9)
Quality of the audio sound	110 (17.2)	288 (44.9)	171 (26.7)	57 (8.9)	15 (2.3)
Ability to talk freely over telemedicine	141 (22.0)	373 (58.2)	110 (17.2)	13 (2.0)	4 (0.6)
Ability to understand the recommendations or diagnosis made	156 (24.3)	328 (51.2)	134 (20.9)	19 (3.0)	4 (0.6)
The performance of the physicians	226 (35.3)	292 (45.6)	107 (16.7)	14 (2.2)	2 (0.3)
The performance of the nurse	223 (34.8)	301 (47.0)	97 (15.1)	17 (2.7)	3 (0.5)
The overall quality of care provided	179 (27.9)	351 (54.8)	95 (14.8)	14 (2.2)	2 (0.3)
The overall telemedicine experience	275 (42.9)	282 (44.0)	64 (10.0)	20 (3.1)	0 (0.0)

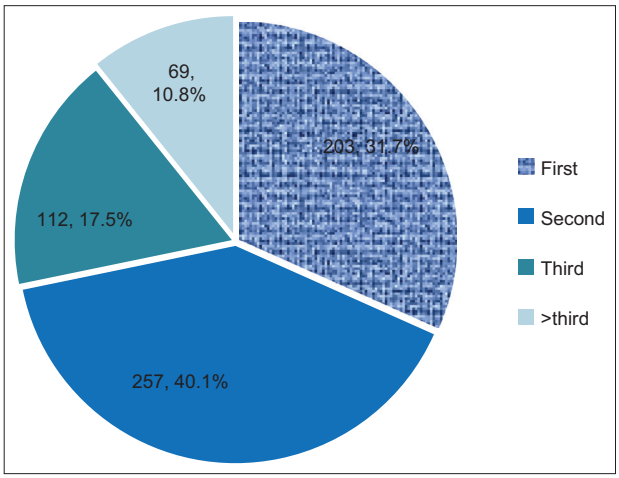

Figure 2: Experience with telemedicine consultation among the participants

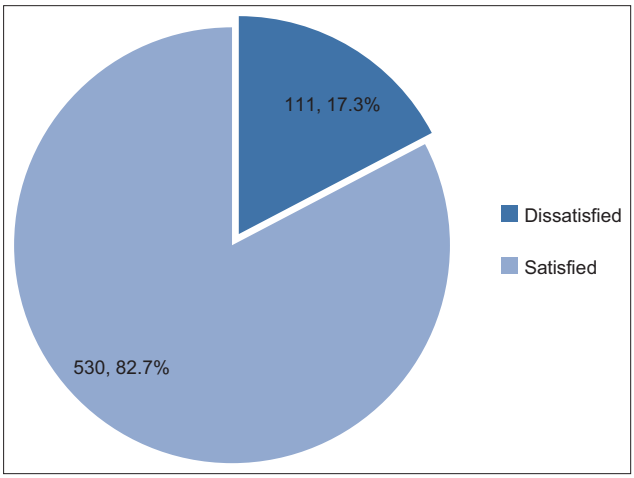

Figure 3: Satisfaction of patients with telemedicine services

with telemedicine services compared to divorces and widowed patients (90.2% vs. 79% and 60.5%, respectively), $P < 0.001$. Patients whose reason for using telemedicine service was lab requests had the highest satisfaction rate (87.6%), whereas those whose reason was no appointment slot in the clinic or other reasons had the lowest satisfaction rate (66.7% and 60%, respectively), $P = 0.005$. Majority of patients with one previous experience (87.9%) compared to 78.6%) of those with two previous experiences were satisfied with the telemedicine services, $P = 0.040$ Table 3.

Multivariate logistic regression analysis revealed that compared to illiterate patients, those with high school education, Diploma and Bachelor/postgraduates were more likely to be satisfied with telemedicine services (Adjusted odds ratio "AOR" and (95% confidence interval "CI") were 4.12 (1.78-9.55), $P = 0.001$, 6.11 (2.12-17.57), $P = 0.001$, and 10.42 (4.21-25.83), $P < 0.001$; respectively. Opposed to patients who reported follow-up as a reason for telemedicine consultation, those reported no appointment slot in the clinic were less likely to be satisfied with telemedicine services (AOR = 0.38, 95% CI: 0.15-0.97), $P = 0.042$. Patients' age, marital status, occupation and experience with telemedicine services were not significantly associated with satisfaction with telemedicine services after controlling for the confounding effect Table 4.

Patients' attitude towards telehealth experience

Majority of patients either strongly agreed or agreed that telemedicine services made health care easier during the virus COVID-19 pandemic (86.7%) and they are willing to participate in another telehealth consultation visit (88.3%). On the other hand, majority of them either strongly disagreed or disagreed that in telemedicine, there is difficulty speaking up and asking questions (85.1%), the physicians paid less attention to them (76.1%), their privacy and confidentiality are unprotected (76%) and there is difficulty in establishing a provider–patient relationship (70.5%) Table 5.

Overall, majority of patients (84.1%) expressed positive attitude toward telemedicine services as shown in Figure 4.

Younger patients (18-35 years) were more likely than older patients (>45 years) to express positive attitude toward telemedicine services (89.6% vs. 77.1%), $P = 0.004$. Single patients had the highest rate of positive attitude toward telemedicine (90.2%), whereas married and widowed participants had the lowest rates (84.4% and 55.3%, respectively), $P < 0.001$. Bachelor/postgraduate patients were more likely than illiterates to express positive attitude toward telemedicine services (86.9% vs. 71.9%), $P = 0.035$. More experienced physicians with telemedicine consultations (>3 times) were more likely than those of first consultation to express positive

Table 3: Factors associated with patients' satisfaction with telemedicine consultation services

	Satisfaction with telemedicine consultation service		*P*
	Dissatisfied *n*=111 *n* (%)	Satisfied *n*=530 *n* (%)	
Gender			
Male (*n*=274)	40 (14.6)	234 (85.4)	0.116
Female (*n*=367)	71 (19.3)	296 (80.7)	
Age (years)			
18-35	30 (12.0)	219 (88.0)	<0.001
36-45	37 (14.7)	215 (85.3)	
>45	44 (31.4)	96 (68.6)	
Marital status			
Single (*n*=132)	13 (9.8)	119 (90.2)	<0.001
Married (*n*=409)	70 (17.1)	339 (82.9)	
Divorced (*n*=62)	13 (21.0)	49 (79.0)	
Widowed (*n*=38)	15 (39.5)	23 (60.5)	
Educational level			
Illiterate (*n*=32)	15 (46.9)	17 (53.1)	<0.001
Read and write (*n*=30)	11 (36.7)	19 (63.3)	
Primary/intermediate schools (*n*=48)	10 (20.8)	38 (79.2)	
High school (*n*=227)	45 (19.8)	182 (80.2)	
Diploma (*n*=68)	9 (13.2)	59 (86.8)	
Bachelor/postgraduate (*n*=236)	21 (8.9)	215 (91.1)	
Occupation			
Unemployed/house wife (*n*=179)	44 (24.6)	135 (75.4)	0.052
Civilian employee (*n*=125)	17 (13.6)	108 (86.4)	
Military employee (*n*=198)	29 (14.6)	169 (85.4)	
Student (*n*=78)	11 (14.1)	67 (85.9)	
Retired (*n*=61)	10 (16.4)	51 (83.6)	
Reason for telemedicine consultation			
Follow-up (*n*=109)	18 (16.5)	91 (83.5)	0.005
Lab request (*n*=137)	17 (12.4)	120 (87.6)	
Refill medicine (*n*=104)	20 (19.2)	84 (80.8)	
Medical advice (*n*=195)	26 (13.3)	169 (86.7)	
Difficult transportation (*n*=58)	17 (29.3)	41 (70.7)	
No appointment slot in the clinic (*n*=33)	11 (33.3)	22 (66.7)	
Others (*n*=5)	2 (40.0)	3 (60.0)	
Experience with telemedicine consultation			
First time (*n*=203)	42 (20.7)	161 (79.3)	0.040
Second time (*n*=257)	31 (12.1)	226 (87.9)	
Third time (*n*=123)	24 (21.4)	88 (78.6)	
>3 times (*n*=69)	14 (20.3)	55 (79.7)	

*Chi-square test

attitude toward telemedicine services (94.2% vs. 76.8%), $P < 0.001$ Table 6.

Multivariate logistic regression analysis revealed that older patients (>45 years) were less likely than younger patients (18-35 years) to have positive attitude towards utilization of telemedicine services (AOR = 0.22, 95% CI: 0.09-0.57), $P = 0.002$. Compared to single patients, widowed patients were less likely to have positive attitude toward utilization of telemedicine services (AOR = 0.11, 95% CI: 0.03-0.42), $P = 0.001$. Compared to illiterate patients, those with high school education, Diploma, and Bachelor/postgraduates were more likely to have positive attitude toward telemedicine services (AOR and 95% CI) were 2.77 (1.18-22.44), $P = 0.029$, 2.81 (1.43-33.38), $P = 0.016$ and 2.89 (1.10-24.13), $P = 0.038$; respectively. Opposed to patients with first time experience with telemedicine service, those with third time or more than this time were more likely to have positive attitude toward telemedicine services (AOR and 95% CI) were 3.52 (1.61-7.71), $P = 0.002$, and 6.52 (2.18-19.54), $P = 0.001$; respectively Table 7.

Discussion

Telemedicine consultation experienced a widespread utilization in the Saudi Arabia, during the lockdown period of the coronavirus disease 2019 (COVID-19) pandemic as it reduces the spread of the infection through remote communication between healthcare providers and their patients. However, patients' satisfaction and attitude are very important to ensuring the quality of the service as well as to define the barriers facing its proper application in the future.[7] Thus, the present study was carried out to assess patients' satisfaction and attitude toward telemedicine consultation among those attending the primary healthcare centers in National Guard facilities, Jeddah-2021.

Patients' satisfaction with telemedicine service

In the present study, most of patients were satisfied with the performance of physicians and nurses, ease of registration/scheduling, and their ability to understand the recommendations or diagnosis made. Furthermore, most of them described the overall quality of care provided and the overall telemedicine experience as either excellent or very good. Overall, majority (82.7%) of patients were satisfied with telemedicine services during COVID-19 pandemic. In a recent, Saudi study carried out in Jeddah (Saudi Arabia) (2020) to assess patients' perceptions and satisfaction regarding teleconsultation during the COVID-19 pandemic, most of the patients effectively perceived teleconsultation (71.43%-88.77%) between 59.40% and 83.96% of them were satisfied with the service.[15] In another study conducted among dermatologists and dermatological patients, 40.2% of dermatologists used teledermatology, whereas 32.7% utilized a virtual clinic and they concluded that the best benefit of teledermatology was triage of patients before inpatient and outpatient visits, and decrease the risk of infections and almost two-thirds of them (64.5%) will consider using teledermatology in the future.[17] Abdel Nasser A, *et al.* revealed that approximately half of Saudi patients (52%) were very satisfied with the ease of registration, whereas 43.4% claimed that they had the ability to speak freely over telemedicine. The highest level of satisfaction was observed among almost half of the participants (53.4%) regarding ease registration, 40.1% regarding quality of the visual image, 41.9% regarding the quality of the audio sound, and 44.8% regarding their ability to speak freely over telemedicine. Furthermore, the highest satisfaction was seen by 40.5% concerning the ability to understand the recommendations, 40.5% concerning the overall quality of care provided, 37.4% concerning the overall telemedicine consult experience.[16] In New York (USA), Ramaswamy A, *et al.* observed

Table 4: Predictors of satisfaction of patients regarding telemedicine services

	Adjusted odds ratio	95% confidence interval	*P*
Educational level			
Illiterate[a]	1.0	-	-
Read and write	1.54	0.53-4.48	0.426
Primary/intermediate schools	2.98	1.08-8.23	0.035
High school	4.12	1.78-9.55	0.001
Diploma	6.11	2.12-17.57	0.001
Bachelor/postgraduate	10.42	4.21-25.83	<0.001
Reason for telemedicine consultation			
Follow-up[a]	1.0	-	-
Lab request	1.51	0.72-3.18	0.227
Refill medicine	1.35	0.62-2.92	0.446
Medical advice	1.04	0.53-2.04	0.919
Difficult transportation	0.47	0.21-1.01	0.062
No appointment slot in the clinic	0.38	0.15-0.97	0.042
Others	0.33	0.04-2.47	0.280

[a]Reference category. Terms of patients' age, marital status, occupation, and experience with telemedicine services were excluded from the final model (not significant)

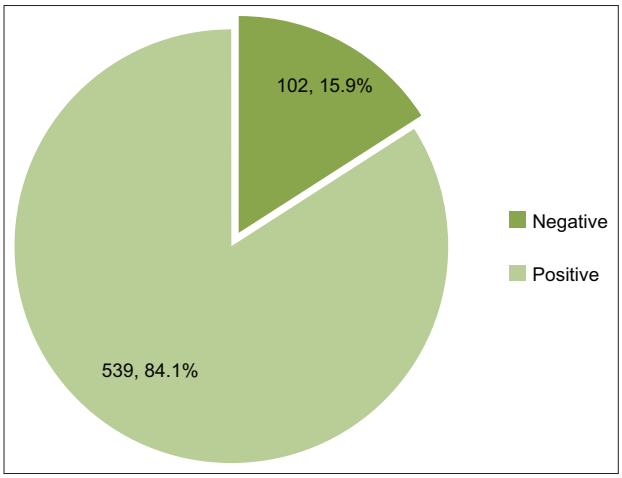

Figure 4: Attitude of patients toward telemedicine services

Table 5: Attitude of patients toward telemedicine services

	Strongly agree *n* (%)	Agree *n* (%)	Neither agree or disagree *n* (%)	Disagree *n* (%)	Strongly disagree *n* (%)	Don't know *n* (%)
Telehealth services made healthcare easier during the virus COVID-19 pandemic.	227 (35.4)	329 (51.3)	42 (6.6)	32 (5.0)	9 (1.4)	2 (0.3)
The presence of the camera and other equipment can embarrass me or make me feel uncomfortable.	58 (4.0)	167 (26.1)	122 (19.0)	226 (35.3)	44 (6.9)	24 (3.7)
I prefer telehealth over the face-to-face consultation visit	75 (11.7)	291 (45.4)	128 (20.0)	122 (19.0)	20 (3.1)	5 (0.8)
I'm willing to participate in another telehealth consultation visit	243 (37.9)	323 (50.4)	34 (5.3)	26 (4.1)	7 (1.1)	8 (1.2)
I'm concern about errors in my care because of difficulty completing my physical exam	13 (2.0)	68 (10.8)	76 (11.9)	337 (52.6)	94 (14.7)	53 (8.3)
My privacy and confidentiality is unprotected	5 (0.8)	38 (5.9)	61 (9.5)	369 (57.6)	118 (18.4)	50 (7.8)
Difficulty establishing a provider-patient relationship	7 (1.1)	50 (7.8)	89 (13.9)	346 (54.0)	106 (16.5)	43 (6.7)
The physicians paid less attention to me	5 (0.8)	30 (4.7)	68 (10.6)	372 (58.0)	116 (18.1)	50 (7.8)
Difficulty speaking up and asking questions	5 (0.8)	26 (4.1)	55 (8.6)	396 (61.7)	150 (23.4)	9 (1.4)
There is a lack of awareness and understanding of telehealth offerings	46 (7.2)	234 (36.5)	103 (16.1)	139 (21.7)	79 (12.3)	40 (6.2)
Telehealth is inconvenient to me as I have poor Internet coverage	45 (7.0)	298 (46.5)	68 (10.6)	117 (18.3)	47 (7.3)	66 (10.3)

Table 6: Factors associated with patients' satisfaction with telemedicine consultation services

	Attitude towards telemedicine consultation service		*P*
	Negative *n*=102 *n* (%)	Positive *n*=539 *n* (%)	
Gender			
Male (*n*=274)	37 (13.5)	237 (86.5)	0.150
Female (*n*=367)	65 (17.7)	302 (82.3)	
Age (years)			
18-35 (*n*=249)	26 (10.4)	223 (89.6)	0.004
36-45 (*n*=252)	44 (17.5)	208 (82.5)	
>45 (*n*=140)	32 (22.9)	108 (77.1)	
Marital status			
Single (*n*=132)	13 (9.8)	119 (90.2)	<0.001
Married (*n*=409)	64 (15.6)	345 (84.4)	
Divorced (*n*=62)	8 (12.9)	54 (87.1)	
Widowed (*n*=38)	17 (44.7)	21 (55.3)	
Educational level			
Illiterate (*n*=32)	9 (28.1)	23 (71.9)	0.035
Read and write (*n*=30)	8 (26.7)	22 (73.3)	
Primary/intermediate schools (*n*=48)	3 (6.3)	45 (93.8)	
High school (*n*=227)	37 (16.3)	190 (83.7)	
Diploma (*n*=68)	14 (20.6)	54 (79.4)	
Bachelor/postgraduate (*n*=236)	31 (13.1)	205 (86.9)	
Occupation			
Unemployed/house wife (*n*=179)	38 (21.2)	141 (78.8)	0.107
Civilian employee (*n*=125)	19 (15.2)	106 (84.8)	
Military employee (*n*=198)	27 (13.6)	171 (86.4)	
Student (*n*=78)	7 (9.0)	71 (91.0)	
Retired (*n*=61)	11 (18.0)	50 (82.0)	
Reason for telemedicine consultation			
Follow-up (*n*=109)	11 (10.1)	98 (89.9)	0.056
Lab request (*n*=137)	21 (15.3)	116 (84.7)	
Refill medicine (*n*=104)	20 (19.2)	84 (80.8)	
Medical advice (*n*=195)	31 (15.9)	164 (84.1)	
Difficult transportation (*n*=58)	8 (13.8)	50 (86.2)	
No appointment slot in the clinic (*n*=33)	11 (33.3)	22 (66.7)	
Others (*n*=5)	0 (0.0)	5 (100)	
Experience with telemedicine consultation			
First time (*n*=203)	47 (23.2)	156 (76.8)	<0.001
Second time (*n*=257)	42 (16.3)	215 (83.7)	
Third time (*n*=123)	9 (8.0)	103 (92.0)	
>3 times (*n*=69)	4 (5.8)	65 (94.2)	

*Chi-square test

a dramatic increase in utilization of video visits during the COVID-19 pandemic (2020) compared to 2019. They concluded that patient satisfaction with video visits was high and not a barrier against the traditional in-person clinic visits.[11] In an older American study, Polinski JM, *et al.* assesses the satisfaction with and preference for telehealth visits among adult patients aged 18 years and above and reported that majority of them (94-99%) were very satisfied with all telehealth issues and about one-third preferred a telehealth visit to a traditional face-to-face visit.[2] Thus, the overall satisfaction of patients with teleconsultation in the present study and other studies is encouraging and needs more focus from the higher authorities.

Factors associated with patients' satisfaction

The present study and in disagreement with others[9,15] revealed that younger patients were more satisfied with telemedicine consultation and expressed more positive attitude toward it than older patients. Furthermore, higher educated patients were more satisfied with telemedicine consultation and expressed more positive attitude toward it than lower educated patients. The same has been observed by others.[15] The positive effect of both younger age and higher education may be explained by the more familiarity of those groups with new technology that facilitates their dealing with telemedicine. Patients more experienced with telemedicine consultation were more likely to express positive attitude toward the service than newly used patients. The same has been reported by others.[9] However, others observed that patients who utilized the service only once were more satisfied with it.[15]

Attitude toward telemedicine services

In the present study, more than half of patients (57.1%) would prefer telemedicine consultation in the future over face-to-face consultation and majority of them (88.3%) would be willing to

Table 7: Predictors of positive attitude of patients towards telemedicine services

	Adjusted odds ratio	95% confidence interval	*P*
Age (years)			
18-35[a]	1.0	-	-
36-45	0.55	0.30-1.00	0.050
>45	0.22	0.09-0.57	0.002
Marital status			
Single[a]	1.0	-	-
Married	0.72	0.34-1.51	0.380
Divorced	0.87	0.29-2.57	0.797
Widowed	0.11	0.03-0.42	0.001
Educational level			
Illiterate[a]	1.0	-	-
Read and write Primary/intermediate schools	0.44	0.11-1.80	0.253
High school	1.86	0.37-9.18	0.449
Diploma	2.77	1.18-22.44	0.029
Bachelor/postgraduate	2.81	1.43-33.83	0.016
	2.89	1.10-24.13	0.038
Experience with telemedicine consultation			
First time[a]	1.0	-	-
Second time	0.54	0.94-2.50	0.087
Third time	3.52	1.61-7.71	0.002
>3 times	6.52	2.18-19.54	0.001

[a]Reference category

participate in another telemedicine consultation. Magliah SF, *et al.* explored the perception of type I diabetic adult Saudi patients toward the implementation of virtual phone clinics during the COVID-19 pandemic and revealed that more than half (59.2%) were satisfied with the virtual phone clinic experience, and 75.6% preferred to continue attending these clinics in the future.[14] Abdelv Nasser A, *et al.* revealed that most of the Saudi patients (84.9%) believed that health care is easier with telemedicine application during the COVID-19 pandemic.[16]

Barriers facing proper application of telemedicine

Poor Internet coverage (53.5%), lack of awareness and understanding of telehealth offerings (43.7%), and the presence of camera (30.1%) were the commonest reported barriers facing proper application of telemedicine according to patients in the present study. Physicians in another Saudi study mentioned that barriers for the utilization of teledermatology included inappropriate infrastructure and practical application in the workplace.[18] In another Saudi study, most of dissatisfied patients were unhappy with the wait time for a teleconsultation.[15] Magliah SF, *et al.* revealed that negative or neutral perception of current health, need to be seen physically, and missing a virtual appointment were the factors associated with lower patient perception of telemedicine consultation.[14]

Study limitations

Some important limitations of the present study should be addressed. First, its conduction in only one city and one healthcare facility could impact the generalizability of findings. Also, its self-reported nature could be exposed to bias. However, the study has importance in exploring some important predictors for satisfaction with telemedicine consultation as well as determining the barriers facing its proper application in the future.

Conclusion

In conclusion, patients managed at primary healthcare centers in King Abdual Aziz Medical City-Jeddah region, Kingdom of Saudi Arabia, were overall satisfied and expressed positive attitude concerning the service of telemedicine consultation during COVID-19 pandemic. However, poor Internet coverage, lack of awareness, and understanding of telehealth offerings and presence of camera were barriers for the optimum application of the service. More in-depth investigation is recommended including patients from other regions of the kingdom to better understand the predictors of satisfaction with telemedicine and barriers for its proper application. Overcoming the barriers mentioned by patients is important for improving the outcome of the service.

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Conflicts of interest

There are no conflicts of interest.

References

1. Avalere. What is Telehealth? Benefits and Opportunities. Available at: https://avalere.com/insights/what-is-telehealth-benefits-and-opportunities. [Last accessed on 31 Oct 2019].

2. 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.
3. Ministry of Health (MOH) March 2, 2020. Saudi Arabia. MOH reports first case of coronavirus infection. https://www.moh.gov.sa/en/Ministry/MediaCenter/News/Pages/News-2020-03-02-002.aspx.
4. Nurunnabi M. The preventive strategies of COVID-19 pandemic in Saudi Arabia. J Microbiol Immunol Infect 2021;54:127-8.
5. Czeisler MÉ, Marynak K, Clarke KEN, Salah Z, Shakya I, Thierry JM, *et al.* Delay or avoidance of medical care because of COVID-19-related concerns-United States, June 2020. Morb Mortal Wkly Rep 2020;69:1250-7.
6. Moreland A, Herlihy C, Tynan MA, Sunshine G, McCord RF, Hilton C, *et al.* Timing of state and territorial COVID-19 stay-at-home orders and changes in population movement -United States, March 1-May 31, 2020. MMWR Morb Mortal Wkly Rep 2020;69:1198-203.
7. Annaswamy TM, Verduzco-Gutierrez M, Frieden L. Telemedicine barriers and challenges for persons with disabilities: COVID-19 and beyond. Disabil Health J 2020;13:100973.
8. Scott Kruse C, Karem P, Shifflett K, Vegi L, Ravi K, Brooks M. Evaluating barriers to adopting telemedicine worldwide: A systematic review. J Telemed Telecare 2018;24:4-12.
9. 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.
10. Russo JE, McCool RR, Davies L. VA telemedicine: An analysis of cost and time savings. Telemed J E Health 2016;22:209-15.
11. Ross J, Stevenson F, Lau R, Murray E. Exploring the challenges of implementing e-health: A protocol for an update of a systematic review of reviews. BMJ Open 2015;5:e006773.
12. Balestra M. Telehealth and legal implications for nurse practitioners. J Nurse Pract 2018;14:33-9.
13. Yang YT, Kozhimannil KB. Medication abortion through telemedicine: Implications of a ruling by the Iowa supreme court. Obstet Gynecol 2016;127:313-6.
14. Magliah SF, Alsabban AS, Turkistani HA, Abulaban BA, Alsharif AH, Alsharif SS, *et al.* Perception of virtual clinics among Saudi adults with type 1 diabetes during the COVID-19 pandemic. Diabetes Metab Syndr 2021;15:102175.
15. Magadmi MM, Kamel FO, Magadmi RM. Patients' perceptions and satisfaction regarding teleconsultations during the Covid-19 pandemic in Jeddah, Saudi Arabia. Research Square, 2020. doi: https://doi.org/10.21203/rs. 3.rs-51755/v1. Available at: https://assets. Researchsquare.com/files/rs-51755/v1/2702bc1c-86cf-4d9f-bb23-04216d8841c3.pdf?c=1631853838.
16. Abdel Nasser A, Mohammed Alzahrani R, Aziz Fellah C, Muwafak Jreash D, Talea A Almuwallad N, Salem A Bakulka D, *et al.* Measuring the patients' satisfaction about telemedicine used in Saudi Arabia during COVID-19 pandemic. Cureus 2021;13:e13382.
17. Almaziad HM, Alfawzan AI, Alkhayal NK, Alkhodair RA. Assessment of dermatologists' perception of utilizing teledermatology during COVID-19 pandemic in Saudi Arabia. Saudi Med J 2021;42:1024-30.
18. Alakeel A. Acceptance of teledermatological practices: A cross-sectional study of practicing Saudi dermatologists. Cureus 2021;13:e13710.