Patients' satisfaction with telemedicine in Qassim region, Saudi Arabia

Abstract

Background: There was tremendous use of Telemedicine since the inception of COVID - 19 pandemic everywhere to curb the social distancing and close contact. Information and Technology given new dimension of delivery of health care to the public. Objectives: To find the Telemedicine satisfaction, demographic factors and other factors association with Telemedicine satisfaction among the Qassim population. **Methods:** There was a cross sectional study conducted among the 385 sample during the period from January 2021 to December 2021. Data was collected through the google forms online questionnaire among aged 19 years and above people. Based on the variables, necessary statistical tests were applied. **Results:** In the present study, 376 participated in the study and distributed questionnaire was 400. Among them 56.4% (212) were males and mean age and standard deviation was 37.91 ± 11.22. About 40.4% were knew the telemedicine services from the government authorities. In the current study, about overall quality of telemedicine satisfaction mentioned from the patients was 77.7%. There was statistically significant association was observed between different levels of satisfaction from satisfied to not satisfied with male gender (male satisfaction 82.5% versus females satisfaction 71.3%, $P<0.05$). **Conclusions:** Based on the study results, close to every four out of five patients were satisfied about Telemedicine services in the Qassim. Little low patient satisfaction was observed among the diabetes, lipid disorders patients and autoimmune diseases. In spite of available normal services in the Qassim hospitals to the patients, still there is need of telemedicine services to the people having chronic morbidity, living in rural areas and to saving money for transport of the patients.

Key words: Telemedicine, Patients Satisfaction, Qassim Province, Saudi Arabia.

Introduction:

Magnitude of the problem:

Telemedicine technology first introduced in the areas of healthcare delivery in late 1960s due to the operational needs of the National Aeronautics and Space Administration (NASA) [1]. Since the pandemic of COVID-19 period, throughout the globe Telemedicine usage drastically increased from developing countries to developed countries.

The Coronavirus (COVID-19) has infected millions of lives and infected most of geographical area more than 200 countries. Since the onset of the COVID-19 epidemic stated that as the pandemic response resulted to infectious diseases epidemiology have changed dramatically, resulting in increased demand for health care professionals. Health officials around the world continue to discuss measures, many governments policies considered for appropriate control to curb the transmission of COVID-19 [2].

The Saudi Ministry of Health (MOH) has recently developed a strategy to prevent the spread of the disease. This strategy includes the use of existing Telehealth applications to diagnose suspected cases, provide long-term care and follow up with COVID-19 patients. As a result, health care systems around the world have become increasingly dependent on telemedicine, especially video counselling. The aim is to improve access to health services and regular outpatient monitoring and to reduce the spread of the virus in the community and in hospitals [3].

According to the World Health Organization (WHO), Telemedicine is "the delivery of accurate information for the diagnosis, treatment and prevention of diseases and injuries using technology by all healthcare professionals to all patients." [4,5]. Telehealth, also known as telemedicine, is a state-of-the-art of telecommunication service that educates health care providers using diagnostic technology, direct management, injury and disease prevention, research and development. It is especially useful for facilitating remote care and medical services when providers are not available regularly. Other benefits of telemedicine include travel costs, efficiency, cost savings, and high patient satisfaction [6-9].

The successful implementation of any health care service, including telemedicine, is highly dependent on patient awareness and satisfaction. They are the main source of information that tells us that health care is being provided properly and that the health care must be meeting their expectations. Dissatisfaction

with telemedicine services makes these services unnecessary and expensive. With the rise of telemedicine services around the world during the COVID-19 epidemic, it is important to maintain a patient quality control index regardless of method of delivery [10,11].

The Saudi Ministry of Health is concerned about the issue of telemedicine in various forums, such as virtual clinics, 937 call centers and SEHA smart phones application. In addition, the Saudi Commission for Health Specialists has launched a Telemedicine training program to train all healthcare professionals with the best international practices in telemedicine [12].

Rationality of the study:

Continuous evaluation of patients' perceptions and the use of high-quality telemedicine success in telemedicine satisfaction and related factors is essential, especially during a pandemic. However, patients' understanding of the benefits and challenges as well as the associated dissatisfaction with telemedicine is limited. Therefore, the present study aimed to assess patients' perceptions, satisfaction with the outpatient Telemedicine Clinics, and the association between socio-demographic characteristics and satisfaction level during the COVID-19 era in the Qassim province, KSA.

Aims & Objectives:

Aim:

To identify the level of satisfaction of patients with Telemedicine in Qassim province.

Objectives:

1. To find the demographic factors and to assess the level of satisfaction of experience with Telemedicine among the patients.

2. To determine the factors associated with satisfaction of patients with Tele medicine

Materials and Methods:

Target Population:

All the patients visited during the period from January 2021 to December 2021 period in Qassim province and their contact numbers collected from the Health authorities. Data was collected through google forms as well as mobile calls to the concerned participants.

Study design:

A cross-sectional study was conducted among general population in Qassim region who attended Telemedicine virtual clinic aged 19 years and above population, Saudi Arabia in the period between January 2021 to December 2021. The current study depends on online self-reported questionnaire which included demographic factors of participants, assessment of patients' satisfaction factors toward telemedicine.

Sample size:

Based on Open Epi sample size calculator, we applied Qassim population as 1,200,000 population, anticipated frequency was 50%, confidence interval was 95% and design effect was 1.0. The sample size estimate was 385, but distributed the questionnaire to 400 patients. Of which, we collected data from 376 study participants. The study included all general population who received the telemedicine in Al Qassim region. The sample was collected from the Qassim province hospitals and required sample selected by random method. From the hospital, individual patients data was collected from the concerned hospital Director or administrator. Then individual patient was selected in our study by again same simple random method.

Study instrument and distribution:

In this study, we depended on online distributed self-reported questionnaire through google forms. The questionnaire was prepared using previous literature [13]. The

questionnaire included two parts; first part was prepared to collected demographic factors of participants including age, gender, nationality, and education level. Second part was prepared for assessment of patients' satisfaction towards telemedicine using 3 point Likert scale (Satisfied, neutral, dissatisfied,) for eleven statements (registration, audio quality of meeting, video quality of meeting, privacy of talk, understanding of instructions, clear about diagnosis, physical atmosphere at virtual clinic, communication skill of doctor, time allotment for doubts, accessibility of telemedicine services and overall quality of telemedicine services during COVID-19). This part of our questionnaire was used before in previous study [13,14].

Inclusion criteria

1. Patients who used any type of telemedicine in the last year.
2. Residents of Al-Qassim region
3. Older than 18 years
4. Both gender
5. Agree to participate in the study

Exclusion criteria

1. Participants do not agree to participate in the study
2. Participants indicate never using of telemedicine
3. Participants who are younger than 19 years old.
4. Residents outside of Al-Qassim region

Ethical considerations:

After Research proposal preparation, the study proposal was submitted to Institutional Review Board, Regional Ethics Committee, Qassim (Ethical approval number 607-43-792). After obtaining Ethical committee approval, execution of the study was done. Oral informed consent taken from the each and every patient. Confidentiality of the personal information was considered and same data will not used for any other purpose. Also explains about the importance of the study to the participants and freedom provided to respondent to participate in the present study.

Statistical analysis:

All filled google forms were transferred initially to MS - Excel. Later MS Excel sheet transferred to SPSS version 21 and SPSS was used for data analysis and tables

interpretation. Frequency and percentages were presented for categorical variables while mean and standard deviation was calculated for description of continuous variables. Chi square test and ANOVA tests were used for determining of the factors affecting patients satisfaction toward telemedicine. All statements about significance was considered, if p value is lower or equal to 0.05.

Results: The current study was conducted among the 376 participants. mean age and standard deviation in the study population was 37.91 ± 11.22 years and age range was 52 (19-71 years). Questionnaire was distributed to 400 participants, about 376 patients participated in our survey. The response rate in the study population was 94%. In our study, about 94.7% were Saudi nationality and 43.6% were females participated. In relation to age group, about 47.1% were belongs to 31-45 years age group in the current study and (62.8%) close to two thirds of study participants were having more than 5000 SR income per month (Table 1).

Table: 1 - Frequency of demographic characteristics among the study population in Qassim province

Nationality	Number of participants	Percentage
Female	164	43.6
Male	212	56.4
Age Category : 18-30 years	112	29.8
31-45yrs	177	47.1
46-60 yrs	71	18.9
> 60 yrs	16	4.3
Nationality: Saudi	356	94.7
Non Saudi	20	5.3
Education Secondary school level	143	38.0
Diploma/Bachelor	189	50.3
PG and Above	44	11.7
Income <5000 SR	140	37.2

5001-10000 SR	132	35.1
> 10000 SR	104	27.7

Table: 2 - Source of information and status of Telemedicine use in the study population.

Source of Telemedicine	Number	Percentage
Social media advertisement	93	24.7
Friends	74	19.7
Relatives	57	15.2
Govt. Authorities	152	40.4
Last Telemedicine use - In the last week	57	15.2
Last week to 1 month	88	23.4
Last 6 months	124	33.0
6 months to 1 year	107	28.5
Before COVID-19 Telemedicine use - Yes	75	19.9
Before COVID-19 Telemedicine use - No	301	80.1

Table 2 revealed that in the study population, about 40.4% were got the information about Telemedicine through Government authorities and 24.7% were received information through social media advertisement. About one third of the study participants were utilized Telemedicine for the last 6 months. Before COVID-19, about 19.9% were received Telemedicine service.

Table: 3 - Satisfaction level on telemedicine consultation on the factors listed below in the study population.

Factors related to Telemedicine	Satisfied	Neutral	Not satisfied
Registration	310 (82.4%)	53 (14.1%)	13 (3.5%)
Video quality of meeting	254 (67.6%)	103 (27.4%)	19 (5.1%)
Audio quality	309 (82.2%)	54 (14.4%)	13 (3.5%)
Privacy of talk	312 (83%)	48 (12.8%)	16 (4.3%)
Understanding of Instructions	302 (80.3%)	58 (15.4%)	16 (4.3%)
Clear about diagnosis	283 (75.3%)	73 (19.4%)	20 (5.3%)
Physical atmosphere at virtual clinic	260 (69.1%)	89 (23.7%)	27 (7.2%)
Communication skill of doctor	302 (80.3%)	55 (14.6%)	19 (5.1%)
Time allotment for your doubt	267 (71%)	86 (22.9%)	23 (6.1%)
The overall quality of Tele Medicine service	292 (77.7%)	66 (17.6%)	18 (4.8%)

Accessibility of Tele Medicine services during the COVID 19 pandemic	299 (79.5%)	54 (14.4%)	23 (6.1%)

Table 3 stated that in the study population, about factors related to Telemedicine, more than four fifth of the study participants given opinion as Telemedicine satisfied in the following components like privacy of talk (83%), registration (82.4%), audio quality (82.2%), understanding of instructions (80.3%), communication skills of doctor (80.3%) and lastly accessibility of Telemedicine (79.5%).

Table : 4- Associations of demographic factors in relation to Overall Telemedicine satisfaction in the study population.

Demographic Variables	Satisfied	Neutral	Not satisfied
Mean age in yrs (n-sample)	37.94 (292)	37.58 (66)	38.56 (18)
ANOVA (F)-0.060, P-919			
Age categories :19-30 yrs	86 (76.8%)	20 (17.9%)	6 (5.4%)
31-45 yrs	139 (78.5%)	30 (16.9%)	8 (4.5%)
46-60 yrs	53 (74.6%)	14 (19.7%)	4 (5.6%)
> 60 yrs	14 (87.5%)	2 (12.5%)	0 (0%)
X^2 - 1.75, 6df, P - 0.941.			
Gender -Female	117 (71.3%)	37 (22.6%)	10 (6.1%)
Male	175 (82.5%)	29 (13.7%)	8 (3.8%)
X^2 - 6.694, 2df, P - 0.035.			
Nationality- Saudi	275 (77.2%)	64 (18%)	17 (4.8%)
Non Saudi	17 (85%)	2 (10%)	1 (5%)
X^2 -0.835, 2df, P - 0.659.			
Education -Secondary school	113 (79%)	24 (16.8%)	6 (4.2%)
Up to bachelor Degree	145 (76.7%)	35 (18.4%)	9 (4.8%)
PG and above	34 (77.3%)	7 (15.9%)	3 (6.8%)
X^2 -0.757, 4df, P - 0.944.			

Table 4 revealed that in the study population, among the females about 71.3% were satisfied with overall quality of Telemedicine services, whereas among the males, the satisfaction level was about 82.5%. There was statistically significant association was observed between male gender and overall quality of Telemedicine services in the study group ($P<0.05$). ANOVA test was conducted to find the different levels of satisfaction with continuous factor of age and the association was not significant ($P>0.05$).

Table: 5 - Morbidity of disease versus Telemedicine satisfaction in the study group.

Morbidity	Satisfied	Neutral	Not satisfied
Diabetes mellitus & Lipid disorders	22 (68.7%)	6 (18.7%)	4 (12.6%)
HTN & Heart disease	17 (81%)	3 (14.3%)	1 (4.7%)
Allergic condition	5 (71.4%)	2 (28.6%)	0 (0%)
Autoimmune disease	3 (50%)	1 (16.7%)	2 (33.3%)
Psychological diseases	14 (100%)	0 (0%)	0 (0%)
Organs failure	4 (100%)	0 (0%)	0 (0%)
> 2 morbid diseases	25 (80.6%)	6 (19.4%)	0 (0%)

Table 5 depicted that in the study group, about highest satisfaction was observed with psychological disease and organ failure patients were about 100%, about 81% satisfied among the HTN and Heart disease patients. less satisfaction (50%) was observed among the autoimmune disease patients.

Discussion:

Before COVID - 19 period throughout the globe telemedicine services utilization was relatively low. Since the COVID-19 epidemic, drastically increased the telemedicine services everywhere increased including developing countries to developed countries. Quality and utilization was little better in developed countries where resources are available[14,15]. The current study was conducted among the patients attended at different hospitals through virtual mode about Telemedicine services in the Qassim province.

In our study, close to half of the people (47.1%) were belongs to 31-45 years age. Overall quality of Telemedicine satisfaction in the study population was 77.7% and very close to similar percentage of patient satisfaction about telemedicine was revealed in Riyadh study (78.9%) [14]. In the present study, certain factors of telemedicine satisfaction was observed more than 80% (privacy of talk 83%, Registration 82.4%, Audio quality 82.2%, Understanding of instructions 80.3%,

Communication skills of a doctor 80.3% and lastly Accessibility of telemedicine services 79.5%). A study conducted in the United States of America revealed that telemedicine patient satisfaction was found as 80%, which is similar to our study finding [16].

Another study conducted at Tertiary care hospital among the Head and neck surgery cancer patients in Netherlands, stated that many hurdles mentioned about telemedicine, including lack of face to face interaction, technical and logistic issues, facial expressions and body language, patient care and lastly mentioned decision making also critical with telemedicine consultations. This could be due to study setting of cancer patients and diagnosis of those patients at the terminal level leads to adverse outcomes[17].

Some studies conducted in East Carolina University, California based study revealed that very high level of patient satisfaction about telemedicine noticed in different settings with sample size of 495 and 657 [18]. In East Carolina study, overall patient satisfaction about telemedicine was 98.3% and also mentioned in other study stated that 71% gave response as 5 (100%) in five point likert scale [19]. Another study conducted in California (USA) based study among 657 participants and stated that very high levels of patient satisfaction was noticed in their study. Also mentioned in his study about Telemedicine services as easier access to Specialists, reduced waiting time, travel time, lack of appointment issues, financial savings and also indirectly reduces the cultural barriers [20].

Those patients having autoimmune diseases as co-morbidity, the telemedicine satisfaction level was only 50% in the current study. Another study conducted among autoimmune rheumatology patients during the COVID-19 period among 19 years and above age group in USA, revealed that telemedicine satisfaction level was 25.8% [21]. Another study conducted in Aga Khan University, Pakistan by Riaz MM, Mahmood SB et al published paper in the year 2022 revealed that the 76% of the patients agreed Rheumatology teleconsultation even after the COVID-19 pandemic and also stated that the convenience for outpatient services of Rheumatology [22]. Another international study conducted in Hong Kong in the year 2020 by Department of Medicine about autoimmune diseases versus telemedicine

consultation, they expressed as confidence and acceptance about autoimmune diseases (Lupus nephritis) by telemedicine [23].

In our study, demographic factors like age, nationality, education and income were not significantly associated with overall quality of Telemedicine. But, male gender was significantly associated overall quality of telemedicine ($P<0.05$). A study conducted in University of Liberal Art of Bangladesh, published in the year 2022 stated that male gender was significantly associated with telemedicine [24].

In the present study population, in relation to source of information about Telemedicine, about 40.4% of study participants got the information from Government authorities. A study conducted in Aden University, Yemen and also in China in the year 2020 stated that source of telemedicine from the government authorities and extensively supported to form telemedicine services to curb the prevention and cure about COVID-19 and also for other diseases from poor to rich resource countries [25,26]. During COVID-19 pandemic, majority of the countries taken great initiation to emphasize the role of Telemedicine services in health care system.

Some of the limitations in our study, as during the data collection, we faced little difficulty in access to the data privacy about patient files. Some patients are not responding to the google forms. Lack of contact information in some patient files and in spite of that we completed the study.

Conclusions:

Based on study results, patient satisfaction level was relatively low, comparatively studies conducted in some developed world countries. Little less telemedicine satisfaction (two thirds of patients) was observed among the patients with diabetes with lipid disorders and close to half telemedicine satisfaction with autoimmune diseases. As these diseases are in a chronic nature, multi organ involvement and purely depends upon the patient control about their diet and attitude. Still there is further improvement in patient satisfaction is required through increase awareness among the general population through existing awareness campaigns related to telemedicine services in health care system.

Recommendations:

Emphasize the importance of Telemedicine services to chronic patients for their time saving for distance, decrease appointment waiting list, cost effective and good quality satisfaction.

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