

Utilization and Acceptability of Telemedicine during COVID-19 Pandemic for the Diabetes Care as an Alternative to Physical Examination

Utilization and Acceptability of Telemedicine during COVID-19

Arsalan Nawaz¹, Muhammad Adnan Hasham², Rabia Arshad³, Imran Ahmed Moinudin¹, Muhammad Kashif¹ and Maida Nazir¹

ABSTRACT

Objective: To know the utilization and acceptability of telemedicine during COVID -19 pandemic for the diabetes care as alternative to physical examination.

Study Design: Cross-sectional study

Place and Duration of Study: This study was conducted at the Services Hospital Lahore from 1st December 2020 to 31st May 2021.

Materials and Methods: This cross-sectional study was conducted at the Services Hospital Lahore after approval of institutional review board (Ref No.IRB/2020/702/SIMS dated 19-09-2020), Total of 493 patients who had meet the inclusion criteria were interviewed with a questionnaire in Urdu language. Questionnaire was based to know the acceptability in terms of issue resolution, privacy concerns, cost effectiveness, time saving and problems faced while using telemedicine and their overall satisfaction.

Results: Of 493 patients included in this study, mean age was noted to be 45.9±12.9 years and majority (55.6%) were male. Phone call mode was the most used method by 59.6% of patients for telecommunication as compared to Whatsapp (40.4%). Regarding education level, 83.5% have education level below matric. Majority of people (83.2 %) belongs to rural area. Level of education and residence has significant impact on choice of telemedicine modality (p value < 0.005). Willingness to use telemedicine in future was shown by 96.34% of participants.

Conclusion: It was concluded that most of the patients were satisfied with the services and want to continue using telemedicine. The main problems faced were time limitation and busy number. To minimize these problems there should be a dedicated team for running this telemedicine at least 12 hours per day.

Key Words: COVID-19, Telemedicine, Diabetes Mellitus

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INTRODUCTION

Covid-19 first emerged in Wuhan city, Hubei Province of China in December 2019 which rapidly became a pandemic. Pakistan has reported its first case of COVID-19 on 26th February 2020. Globally, as of 14th April 2023, there have been more than 760 million confirmed cases of COVID-19 reported to WHO.¹

¹. Department of Medicine, UCMD, University of Lahore Teaching Hospital, Lahore.

². Department of Endocrinology & Metabolism,, SIMS, Services Hospital, Lahore.

³. Department of Medicine, KEMU, Mayo Hospital, Lahore.

Correspondence: Dr. Arsalan Nawaz, Assistant Professor of Medicine, UCMD, University of Lahore.

Contact No: 0336-6106406

Email: drarslan21@gmail.com

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SARS CoV 2 has characteristic of rapid person to person spread. Since there was no effective treatment or vaccine available initially, the focus was to limit the infection spread. Quarantine of the cases and effective lock down were the few strategies to minimize the spread and implemented in many countries with positive outcomes.^{2,3} In March 2020, The Govt. of Pakistan also implemented nationwide lockdown to reduce COVID-19 transmission.

Travel restrictions, lockdown and economic losses during COVID era made the things more difficult for the people with chronic ailments.⁴ Diabetes Mellitus is the one of these chronic illnesses and diabetic patients need to have regular consultations regarding the management of diabetes and for the titration of doses and uninterrupted supplies of insulin and medications. Managing diabetes mellitus and its complications costs a huge expenditure even in the most developed countries. Moreover Diabetes Mellitus is associated with higher morbidity and mortality in patients with COVID-19. Optimization of blood glucose levels helps prevent the grave consequences of COVID-19.⁵

In this whole scenario, with the help of technology, many patients who were at risk of catching up infection if they have to visit hospital were engaged and given online consultations, and this experience was found a cost effective and safe in COVID-19.⁶

Telemedicine (referred to as “the use of information and telecommunication technologies in medicine) has been used since long worldwide for diabetes management and found very cost-effective strategy.^{7,8} Furthermore, older patients and a longer duration of intervention provide superior results.⁹

Telemedicine emerged to frontline of medical care during this COVID 19 pandemic in developing countries as well and became a popular approach. Patients can contact their physicians from their home keeping the high-risk patients away from clustered areas of long weighting queue. Particularly more beneficial for the people of far-flung areas and for the elderly who found travelling difficult. Besides the obvious benefits there are some practical difficulties in utilizing this service which includes the non-availability of gadgets, absence or poor quality of internet facilities at some areas and small size telemedicine facilities. Also, the education level of patient and their understanding about telemedicine is important.^{10,11}

Other factors which limit the usefulness of telemedicine are technological maturity, convincing providers that telemedicine is an effective way to treat patients, getting staff to accept the idea and teaching patients the technological skills required to access telemedicine.¹²

The rationale of the study was to determine the usefulness of telemedicine from the patient’s perspective about its effectiveness, its shortcomings and people’s willingness to use it in routine after the pandemic. This will pave the way for telemedicine to be utilized on routine basis after current pandemic will be over and this study will help in finding the barriers for telemedicine and uplift the use of modern technology in current healthcare facilities.

MATERIALS AND METHODS

This cross-sectional study was conducted in Services Hospital Lahore during a period of 6 months from 1st December 2020 to 31st May 2021. All the patients of age

13 and above of both gender who used telemedicine during this period and responded were included in the study. Non-probability consecutive sampling was used to enroll patients. Patients who refused to participate, who were under 13 years of age and who have some psychiatric illnesses were excluded. Total 1000 patients were approached; some people didn’t respond so finally 493 patients who had matched our inclusion criteria were included. Informed consent was taken. Information regarding their demographic data was noted in the performa. Response to all questions through a predesigned questionnaire was noted using a mobile app kobo toolbox. Confidentiality of the data was ensured.

Analysis of data was done with SPSS version 22.0. Numerical variable i.e., age, time since diagnosis, were summarized as mean and standard deviation. Qualitative variables like gender, education, residence, mode of telemedicine used, resolution of the concerned issue and future use and mode of telemedicine were presented in the form of frequency and percentages.

RESULTS

Of 493 patients included in the study, patients ranged from 16 to 80 years in age with a mean of 45.9±12.9 years. Majority (55.5 %) were male. Different diabetic complications were present in 58.6% of participants (n=289) and 36.1% (n=178) patients had other associated comorbidities.

Table 1 Shows basic demographics with respect to age, gender, education, urban and rural stratification and issue resolution with mode of telemedicine used.

Table II shows crosstabulation of education and residence with current used modality

Figure 1 shows reason for using telemedicine

Figure 2 shows problems faced with the mode of communication they used.

Table 3 Acceptability and utilization were marked on lickert scale from 0-5 score while 0 being the maximum negative response and 5 being the maximum positive response. Most of the People showed positive response, mean score was above 3.5 for all categories.

Figure 3 shows willingness for future use of telemedicine.

Table No. 1: Baseline features of participants using different mode of telemedicine

	Mode of telemedicine		
	Phone call	WhatsApp	Total (n)
N	358 (72.6 %)	135 (27.3 %)	493
Age			
Below 45 years	102 (68.45 %)	47 (31.54 %)	149
45 years & above	256 (74.41%)	88 (25.58%)	344
Gender			
Male	189 (68.97 %)	85 (31.02 %)	274
Female	169 (77.16 %)	50 (22.83%)	219
Education			
Up to Matric	311 (75.48 %)	101 (24.5 %)	412

Above Matric	47 (58.02 %)	34 (41.9 %)	81
Direct or indirect contact			
Self	148 (66.07%)	76 (33.92 %)	224
Attendant	210 (78.06%)	59 (21.93%)	269
Residence			
Urban (Within 25 km of metropolitan)	69 (83.13 %)	14 (16.86 %)	83
Rural (Outside 25 km of metropolitan)	289 (70.48%)	121 (29.51%)	410
Insulin and non-insulin users			
Insulin	326 (77.99 %)	92 (22.0%)	418
Non-Insulin	32 (42.66%)	43 (57.33 %)	75
Resolution of issue			
Yes	324 (65.72%)	127 (25.76%)	451
No	34 (80.95%)	8 (19.04%)	42

Table No. 2: Cross tabulation of education & residence with currently used modality of telemedicine

		Currently used modality		Total	p-value
		Phone call	WhatsApp		
Education	Below matric.	311 (75.49%)	101 (24.51%)	412	0.001
	Matric & above	47 (58.02%)	34 (41.98%)	81	
Residence	Urban	69 (83.13%)	14 (16.87%)	83	0.02
	Rural	289 (70.49%)	121 (29.51%)	410	
Total		358 (72.62%)	135 (27.38%)	493	

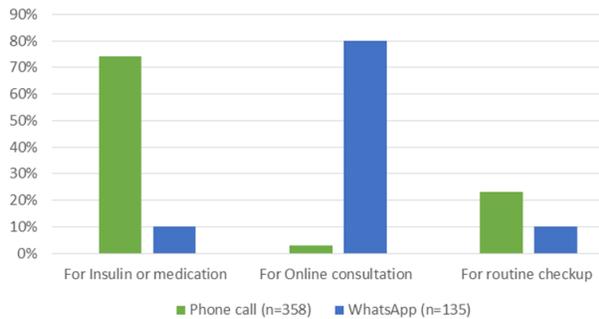


Figure No. 1: Reason for using telemedicine

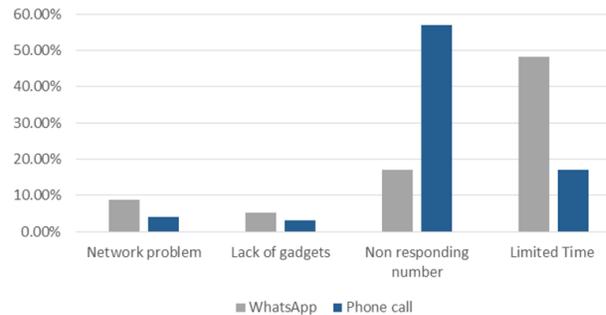


Figure No. 2: Problem they faced with mode of telemedicine used

Table III: Level of acceptability and utilization of telemedicine with the score

	Score						n	Mean
	0	1	2	3	4	5		
Level of Comfort	5	8	17	94	275	94	493	3.84
Level of Convenience	6	13	36	105	256	77	493	3.67
Acceptability for no physical examination	9	14	40	139	238	53	493	3.51
Concerns about privacy	0	1	8	65	295	124	493	4.08
Level of overall Satisfaction	4	10	23	103	256	97	493	3.80
Cost effectiveness	4	4	13	72	246	154	493	4.0
Time Saving	2	4	24	81	232	150	493	4.00

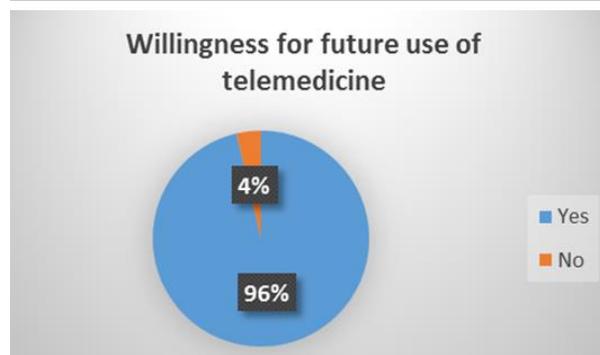


Figure No. 3: Willingness for future use of telemedicine

DISCUSSION

Telemedicine has emerged to frontline of medical care during this COVID 19 pandemic. Besides the obvious benefits there are some practical difficulties. We conducted our study to assess the usefulness, acceptability and outcomes of the telemedicine in the current scenario amongst diabetic patients.

Systematic reviews on benefits of telemedicine in diabetes showed a sustained improvement in glycemic control, weight reduction and improvement in quality of life with telemedicine care.^{13, 14}

A large data from 2005 to 2017 published by Barnett et al shows mean age of telemedicine users was 38.3 years, majority were female (63%) and 83.3 % of population was residing in urban area.¹⁵ This is contradictory to our study, where mean age of participants is higher i.e., 45.9 ± 12.9 years, majority (55.5 %) are male and 83.2% belongs to rural areas. Some of the reasons for these differences include our study being conducted during the pandemic which made physical access to health care facilities difficult and easy accessibility to different modes of telecommunication which might not be there one and half decade ago.

A study by Stronge et al demonstrated the benefit of telemedicine in elderly population especially in rural communities in terms of improving health care access and cost reduction.¹⁶

In our study 83.5% of participants have education level below Matric, which interestingly corresponds to the people who preferred phone call (72.61%) rather than advanced technology in the form of WhatsApp.

Phone call was the mode most people used as compared to WhatsApp, the major reasons behind this are easy availability of mobile phone and landline, low cost and option to directly discuss with the treating physician which is more satisfying than to contact through WhatsApp which need special android phones and internet connection.

Our study shows that 96% of patients (n=475) were satisfied with telemedicine service with average score

of 3.82 on Likert scale which is different from the study by Chae et al where 72% of patients were satisfied with the telemedicine.¹⁷ The reason might be, this is relatively a new concept in Pakistan where people can get consultations from home which saves time and money.

Regarding the cost effectiveness, a study in India by Kesavadev et al conducted on 1000 type 2 diabetic patients demonstrated the cost-effectiveness of telemedicine by reduction of long-term complications, better glycemic control and less visits to hospital.¹⁸ Similarly, studies by Wang et al and a large meta-analysis by Lee et al established the cost-effectiveness of telecare.^{6,8} This corresponds to our study where majority participants appreciated the cost effectiveness of our telemedicine program.

The major problems identified by Kesavadev et al and Mahmood et al were communication gaps, inefficient response to questions, infrastructure and unavailability of the person to attend the phone.^{18,19} Similar problems are identified in our study, most common are limited time and non-responding number which was too obvious due to limited time for telemedicine and not having multiple counters to cope with loads of patients. The present study has certain limitations. It was a single-center study which was conducted during the pandemic. Also, our study was not primarily centered on clinical outcome in terms of diabetes control. Long term follow-ups studies especially after the pandemic will be over are needed. It will lead to improvements in the current telemedicine setup. Also, as the technology is advancing, in future it may be possible to design specific software and mobile applications which connect patients with their physicians more easily.

CONCLUSION

It is concluded that current telemedicine services receives much appreciation from the people during the pandemic. There are many areas of improvement in infrastructure of telemedicine setup and training of staff. Currently majority of the patient are satisfied with the service and want to continue in future. The main problems noticed were limitation and busy number. To minimize these problems there should be a dedicated team having multiple counters for running the telemedicine service with at least 12 hours per day or more in future.

Author's Contribution:

Concept & Design of Study:	Arsalan Nawaz Muhammad Adnan
Drafting:	Hasham, Rabia Arshad
Data Analysis:	Imran Ahmed Moinudin, Muhammad Kashif, Maida Nazir
Revisiting Critically:	Arsalan Nawaz, Muhammad Adnan

Hasham
Final Approval of version: Arsalan Nawaz

Conflict of Interest: The study has no conflict of interest to declare by any author.

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