THE PERCEPTION OF DIABETIC PATIENTS TOWARDS TELEMEDICINE SERVICES IN LAHORE, PAKISTAN

BATCH A-2

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The perception of Diabetic Patients Towards Telemedicine Service in Pakistan

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Abstract:

Introduction:

Globally, the need to limit face-to-face consultations after the emergence of COVID-19 without compromising the quality of and access to essential health services has revolutionized telemedicine service. Its importance is especially noticed in patients requiring regular monitoring like in diabetes mellitus. However, for the utilization of telemedicine service to reduce outpatient visits, it is important to study patients' perception of telemedicine in enhancing health delivery.

Objective: The aim of this study is to determine the perception of patients with diabetes mellitus towards within a tertiary care hospital in Lahore, Pakistan.

Study Design:

A descriptive, cross-sectional study will be conducted using a structured, self-administered questionnaire. Patients sign a written informed consent before participating in the study.

Study Setting: The SIDER Department (Sakina Institute of Diabetes and Endocrine Research) in Shalamar Hospital Lahore, Pakistan.

Subjects: Diabetes Mellitus (type 2) patients visiting the OPD SIDER Department.

Conclusion: Diabetes is one of the contributors of morbidity in Pakistan. Management of diabetes can be effectively done via telemedicine given that patients have accessibility to telemedicine services and they know how to utilize telemedicine services.

Keywords: Telemedicine, Perception of Telemedicine, Diabetes Mellitus, Pakistan,

1. Introduction

Globally, the need to limit face-to-face consultations after the emergence of COVID-19 without compromising the quality of and access to essential health services has revolutionized telemedicine service [1]. Debate on the necessity and feasibility of telemedicine has pervaded across a range of medical specialties and care settings[1], further expanding its boundaries and applications. Its importance is especially seen in patients with diabetes mellitus as well as its associated comorbidities requiring regular monitoring.

The International Diabetes Federation (IDF) reports a continued global increase in diabetes prevalence, confirming diabetes as a significant global challenge to the health and well-being of individuals, families, and societies[3]. Approximately 537 million adults worldwide (between 20-79 years) are living with diabetes. The prevalence of diabetes in Pakistan increased from 7.9% in 2011 to 30.8% in 2021, and by the year 2030, this value is estimated to be at 32.8 [4]%. Consequently, yearly diabetes-related expenditure per person has risen from 36.0 to 80.1 USD within the last ten years (2011-2021), and the projection for this value is estimated to be 99.3 USD by 2030 [5]. Three in every four adults with diabetes live in low- and middle-income countries, which makes delivery of equitable health care to diabetic patients challenging [3]. Therefore, it is imperative to devise a healthcare provision strategy that is cost-effective and accessible.

Moreover, treatment and care of this chronic condition require multiple regular visits for blood glucose monitoring, medication adherence and prevention of complications [11]. A previous study identified that HbA1c visits can be made accessible through telemedicine [7]. With solutions of this type, patients do not need to visit the doctor for minor ailments at all [8], further adding to the potential benefits towards patient's healthcare that telemedicine can have.

Hence, telemedicine can offer a suitable alternative to standard face-to-face consultations in outpatient settings and provide sufficient access to appropriate diabetes care, saving financial resources and time [6].

Telemedicine will be beneficial to the Pakistani healthcare system in terms of preventive care and disease treatment [9]. It is important to devise and implement evidence-based telemedicine strategies for the delivery of safe and equitable patient-centered care. Patients face tremendous challenges in accessing healthcare facilities as 62.56 % of the population of Pakistan lives in remote areas [10]. Telemedicine can contribute tremendously towards achieving universal health coverage [12], and it is essential to identify barriers that these patients can face accessing telemedicine.

2. Research question

What is the perception of patients towards the implementation of telemedicine for diabetes management?

3. Hypothesis

N/A

4. Aim

To study the perceived barriers and facilitators of telemedicine delivery to diabetic patients along with the probable feasibility of implementing telemedicine for diabetic care at a tertiary care hospital in Lahore, Pakistan.

5. Objectives

1) To determine perception of diabetic patients to use telemedicine services for diabetes-related consultations of patients.

2) To report the health beliefs of patients towards telemedicine services.

3) To determine patients' perceived barriers and facilitators to using telemedicine services.

4) To study the association of health beliefs about telemedicine and perceived facilitators and barriers with the willingness to use telemedicine services.

5) To spread awareness about telemedicine and its use in management of diabetic patients.

6. Methodology

6.1 Study Design

Cross-sectional study will be conducted at Sakina Institute of Diabetes & Endocrine Research (SIDER) in Shalamar Hospital, Lahore, Pakistan.

6.2 Sampling

Convenience Sampling

6.3 Sample Size

385 (95% CI and ±5%). Magnitude collected for a prospective study using Cochran's formula of sample size of a large population. According to the International Diabetes Federation, 30.3% adults in Pakistan are affected by diabetes in 2022 [2]. Accordingly, the population size for type 2 diabetic people in the district Lahore is assumed to be a large population size.

6.4 Study Setting

Shalamar Hospital OPD- SIDER

6.5 Duration

10 months from September 2022 to June 2023

6.6 Inclusion Criteria

Diabetic patients, age 18-66 years, out-patient consultation

6.7 Exclusion Criteria

Diabetic patients with other comorbidities, presenting complaints requiring emergency/urgent care, patient who can't read and write, Gestational diabetes

6.8 Data Collection Tool

An interview-based questionnaire with detailed questions about perception, barriers and facilitators towards telemedicine will be employed. The questionnaire comprises 4 parts:

A. Demographics

B. Health beliefs about telemedicine

C. Perceived barriers

D. Perceived Facilitators.

Demographics include age, gender, educational status, disease duration, treatment regimen, the reason for the current visit, past telemedicine experience, socioeconomic status, internet/computer access, and willingness to use telemedicine platforms to seek diabetes-related consultations, will be inquired.

Health belief about telemedicine is adopted from a previous study and modified to study health belief about telemedicine of patients. It uses a Likert scale ranging from 1 to 5, with '1' being 'strongly disagree' and '5' being 'strongly agreeing.' It is a valid and reliable scale with Cronbach's alpha for each subscale.

Perceived barriers and perceived facilitators is a self-made scale constructed on the data available using previous systematic reviews reporting perceived barriers and facilitators to telemedicine services among patients with chronic conditions. It uses a Likert scale ranging from 1 to 5, with '1' being 'strongly disagree' and '5' being 'strongly agreeing'. For each question, the options 'Strongly disagree', 'Disagree', and 'Undecided/Not sure' will be considered as 'NO'. Contrarily, the options 'Agree' and 'Strongly agree' will be considered as 'YES'. Each question answered 'Yes' will be given a score of '1' and each question answered 'NO' will be given a '0' score.

6.9 Pilot Testing

To establish the validity of each question in the questionnaire, pilot testing will be carried out. The anonymous self-administered questionnaire will be administered to 30 patients from OPD-

SIDER, Shalamar Hospital, and the research will be carried out from start to finish. Depending on the outcomes, the questionnaire will then be modified to ensure that it applies to a larger sample.

6.10 Data Collection Procedure

Anonymous interview-based questionnaires will be filled by outpatient diabetic patients. The questionnaires will have both English and Urdu versions. The data collection team will comprise students carrying out the research project. Subjects will be selected in a randomly-controlled manner.

6.11 Data Analysis

Data will be analyzed with SPSS 27.0 (IBM, NY, USA). For categorical variables, frequencies and percentages will be calculated. For continuous variables, means with standard deviation will be calculated. Mean scores for the health belief model of telemedicine will be evaluated for association with perspectives about facilitators and barriers of telemedicine. Perception and willingness for telemedicine consultations of patients will be studied for association with perceived barriers and facilitators. T-test will be used to study association of mean scores of telemedicine belief and willingness for telemedicine consultancy.

7. Ethical Consideration:

We request approval from the IRB of Shalamar Medical and Dental College for the conduction of this study. Written informed consent will be taken from every patient who agrees to participate in the research. There will be no discrimination based on age, gender, race, or religion. The paper-based questionnaires will be kept in a locked cupboard for a period of 2 years. The digital files will be kept in a password protected computer, ensuring the participants information is kept private.

8. Budget:

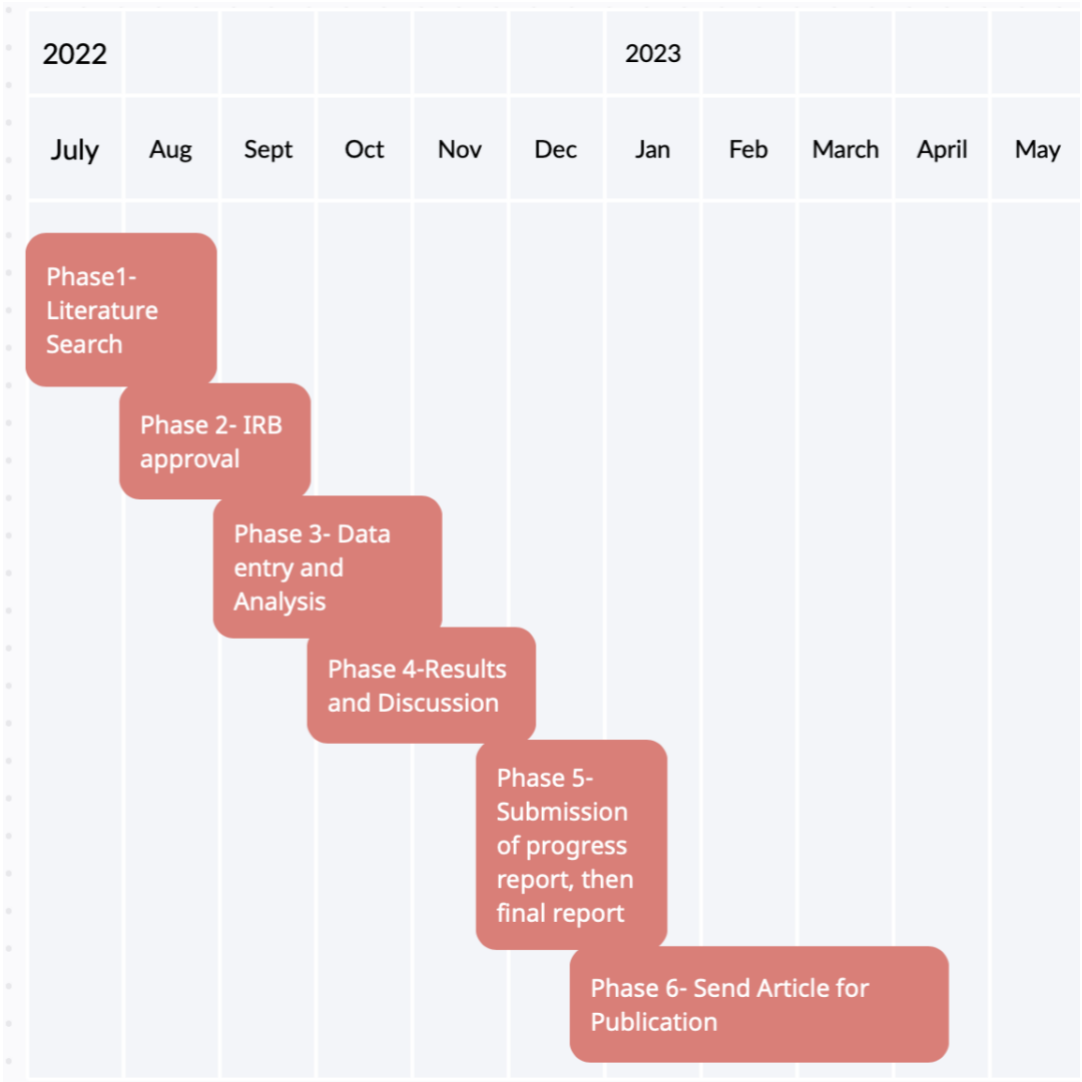
Total amount requested: Rs 240,600

No	Item	Amount requested from grant	Amount available from other sources
1	PERSONNEL Field workers/data collectors	10000	Nil
2	MATERIAL AND SUPPLIES -Ball pen (10 pack) -Plastic files (10 files) -Clipboard (20) - External Hard Drive (32 GB Data Storage) (1 drive) -Record registers (5 register) -Pamphlets (500)	 Rs.3000 Rs.2000 Rs.5000 Rs.1000 Rs. 5000	 Asfand Yaar

3.	EQUIPMENT -Pilot testing questionnaire (40 copies) -Study Questionnaire 1 (Baseline data) (300 copies) -Consent Form	 Rs. 1000 Rs. 5000	Nil
4.	Training - Training of Data Collectors /Field Workers (4 sessions – data collection, research ethics, data entry,communication) (refreshments, stationery, posters)	5000	Nil
5. .	Dissemination of results** -Publication in an International peer-reviewed, open access journal -Attendance and Presentation at one local conference	200,000	Nil

6.	Total PKR -Host Institution Management Fee (2% of the budget) - Miscellaneous Overheads (3% of the budget	3600	–
	Total PKR	240,600	

9. Proposed Project Milestones:



10. Expected Outcomes

The expected outcome of this study is that patients with positive telemedicine belief will be willing to start and/or continue telemedicine services for diabetes management.

11. Dissemination of findings:

Results will be published in a peer-reviewed journal and shared with the wider health and non-scientific community through conferences.

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13. Informed consent:

You are being invited to participate in the research, 'The perception of Diabetic Patients Towards Telemedicine Service in Pakistan,' taking place under the supervision of Dr. Huma Ashraf. To participate in the research, you need to answer the questions to the best of your knowledge. In the study, you will be asked about some personal information like age, education, the reason for an OPD visit, willingness for patient care through online platforms, belief about telemedicine, and perspective about the advantages and disadvantages of telemedicine. You are free to not answer any questions.

telemedicine involves healthcare facilities through online platforms, which may be cost and time effective for patients and doctors. Your perspective is essential to implementing telemedicine programs for diabetes care. This data will help us analyze and overcome barriers and enhance facilitators for the provision of telemedicine to patients.

Please note that this is research and does not offer any treatment or diagnosis. You are assured that you'll receive the same healthcare quality irrespective of your decision to participate in the research. Participants will gain insight into telemedicine and its advantages. We will email the completed article to all participants to gain insight into the studied topic at the end of the research.

There will be little to no risk of physical harm if you participate in the study. Participants may experience some fatigue associated with educational lectures and questionnaire filling. In addition to this, your personal information will be kept confidential at any expense. All the shared information will be kept saved in the password-protected computers, which will be accessible to our research team only. We assure you that your information will never be posted anywhere without your consent. The research will analyze only the responses, and personally identifying information, including name and patient registration number, will not be published or released to anyone.

You are welcome to participate only if you voluntarily agree to become a part of our study. You can withdraw your consent at any point by contacting the mobile number given below. If you have questions about the research study, research subjects' rights, and in case of research-related problems, you can contact Dr. Huma Ashraf at Shalamar Medical and Dental College. If you have any concerns about your role as a research participant, kindly contact IRB (Ext: 7208).

This study will start at least a week after the distribution of informed consent. In the meantime, you are free to discuss your participation with family and friends.

Consent:

I have read and understood the consent form for voluntary participation in the research. I was allowed to ask questions about the research and my role as a participant. I voluntarily agree to participate in this study.

Signature: ..... Dr. Huma Ashraf Date: .....
Name: Mobile No.:
Email ID (if applicable):

14. Questionnaire

A) Socio-demographics

Age: years

Sex:

Educational status

Educational status				
I can read and write	Primary Education	Secondary Education	Bachelors	Masters

Since how long have you been diagnosed with Type-2 Diabetes Mellitus?

Do you have any additional medical conditions?

- Yes
- No

If you selected no, please specify: _____

Your current treatment regimen?(please tick)

- Insulin
- lifestyle changes
- Oral antidiabetics
- Others, please specify: _____

How often do you come to the hospital for checkup/follow-up?

- Monthly
- 6 monthly
- Yearly

Have you had any experience with telemedicine in the past? (Awareness)

What is your monthly household income?

- Upto 50,000
- 50,000 to 200,000
- 200,000 +

Do you have computer/ internet access at home?

- Yes

- No

Do you feel comfortable sharing your personal details/ details of your illness on a video/phone call?
- Yes
- No

Will Telemedicine be more convenient for you?
- Yes
- No

Reason of your current visit:
- Newly diagnosed
- Referral
- Complications like infection
- Inability to control blood sugar level
- Regular visit
- Other (please specify)

Will you feel confident in the care provided by a physician through an online platform?
- Yes
- No

Telemedicine is a platform to provide healthcare facilities including consultations using internet services including but not limited to whatsapp call, and skype consultations. Through this questionnaire, we want to seek opinions on using Telemedicine for diabetes related consultations. Please provide information related to Telemedicine consultations to the best of your knowledge.

B) Perception about Internet Use

Q. What do you feel/think about Internet use for diabetic treatment?	Strongly Disagree	Disagree	Undecided/Not Sure	Agree	Strongly agree
Instructions: Please choose the most appropriate	1	2	3	4	5
Perceived Ease of Internet Use					

My interaction with the Internet/phone for seeking diabetic care is clear and understandable					
I find the Internet/phone for seeking diabetic care to be flexible to interact with					
It is easy for me to become skillful at using the Telemedicine for diabetic consultations					
Perceived Usefulness of the internet					
Using the Telemedicine is useful in managing my diabetic health					
Using Telemedicine for diabetes-related information will be advantageous in better managing my health					
Using the Telemedicine for diabetes-related information is beneficial/useful to me					
Attitude Toward health-related internet use					
Using Telemedicine for diabetes-related information and management would be a good idea					
I like the idea of using Telemedicine for diabetes-related information and management					

Using Telemedicine for diabetes-related information and management would be a pleasant experience					

C) Barriers towards Telemedicine

Which of the following may be a barrier to seeking diabetes consultation using Telemedicine(online) platforms?	Strongly Disagree	Disagree	Undecided/Not Sure	Agree	Strongly agree
Instructions: Please choose the most appropriate	1	2	3	4	5
Patient Barriers					
I am unable to read and write					
I don't know how to use technology					
I am unable to take my medicine as advised by the doctor/physician					
I would like to have in-person consultation with my doctor					
Telemedicine is not useful for diabetes consultations					
Technology access barriers					

I don't have required technology					
Technology (mobile/computer) is not affordable					
I have limited internet access in the area					

D) Facilitators (perceived) for telemedicine

Which of the following may facilitate Telemedicine for seeking diabetes consultation?	Strongly Disagree	Disagree	Undecided/Not Sure	Agree	Strongly agree
Instructions: Please choose the most appropriate	1	2	3	4	5
Telemedicine will help in self-management of diabetes					
Telemedicine would benefit in routine followup					
Telemedicine will increase patient's access to diabetic healthcare					
Telemedicine provides me the convenience to get healthcare					
Telemedicine will decrease my cost of the consultation					
I can use technology comfortably					
Technology is easily available					

Telemedicine will increase my overall health					
I will feel more connected to my doctor					