Electronic Consultation in COVID-19 Scare: A Comparison of Patient Response toward Mobile App vs Call-based Registration

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ABSTRACT

Introduction: Lockdown and quarantine strategies due to coronavirus disease-2019 (COVID-19) scare have made routine health facility inaccessible to patients across the country. To combat this issue, teleconsultation was identified as an interim solution where patients could avail the benefit of routine health check-up.

Materials and methods: We at AIIMS, Mangalagiri, started two electronic consultation (e-consultation) designs to tide over the crisis of lockdown and reach out to our patients. These were call-based (group I) and app-based (group II). The patient response to these two modalities was compared over a period of 6 weeks.

Results: Total registration of 1836 patients was received (1598 in group I and 238 in group II). There was a statistically significant difference between the two groups in response to ease of the registration process and consultation.

Interpretation and conclusion: In our experience, e-consultation through call-based registration fared better than app-based registration. The user-friendly nature of call-based registration design has made it a popular approach among our patients. We strongly recommend the use of e-consultation services by the patients in the current scenario of COVID-19 scare, thus helping the nation fight the dreadful infection by preventing its spread.

Keywords: Corona pandemic, Lockdown, Teleconsultation, Telemedicine.

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INTRODUCTION

Recent pandemic of coronavirus disease-2019 (COVID-19) led to the implementation of lockdown strategies and contact quarantine strategies. All health institutions were forced to shut down their hospitals, nonessential indoor and outdoor facilities lasting more than 21 days. This led to distraught routine healthcare seekers for their maintenance and follow-up visits for outdoor consultation. Helping out this patient population, who were unable to visit their physicians, became a challenge to us. The concept of telemedicine and virtual consultation once considered experimental and futuristic has now become an affordable reality as internet connectivity and networking has become a hand-held technology.^{1,2}

With COVID-19 cases spreading across the country, Government of India (GOI) has recognized the practice of telemedicine.³ The practice got legitimized by the Government of India new "Telemedicine guidelines" for remote teleconsultations.⁴ Telemedicine establishment requires not only central telemedicine set-up but also requires a more or less equally compatible set-up at remote location to be used by patients. However, many audio as well as video applications are now available free of cost on android phones commonly available with majority of patients. So, we have planned and compared two teleconsultation designs for our institution to tide over this crisis of lockdown of COVID-19 and reach out to our follow-up patients in OPD.

MATERIALS AND METHODS

The teleconsultation service at AIIMS Mangalagiri was started with effect from 15th April, 2020, with a common telephone number. The service was named AIIMS Mangalagiri e-Paramarsh.

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As a pilot project, initially we have started e-Paramarsh by issuing dedicated telephone number and roster available for different specialty consultations scheduled on fixed time and days (Table 1). This information was dissipated through our website, local newspaper, and FM radio program. This schedule was followed for 12 days, and we have got 210 patient registrations for consultation. Encouraged by this pilot project and patient program, we have launched two teleconsultation modalities simultaneously. The schedule was propagated in media for public awareness and made functional from 27th April, 2020, to see and compare the patient response.

Table 1: Pilot project details

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
09:00–11:00	General medicine	Community and family medicine	General medicine	Dermatology	Community and family medicine	Ophthalmology
11:00–13:00	Orthopedics	ENT and pain relief clinic	Orthopedics	Pediatrics and psychiatry	Obstetrics and gynecology	General surgery

In the first approach (design I) (group I), we designated eight department specific telephone numbers on tablets kept in OPD. Applications of WhatsApp video and audio calls were activated on these devices. Patients were given a time slot (09:00 AM–11:00 AM) for registration. Registration process was as follows: patients would call the phone number of the desired Department for Registration. After the call is connected, basic details (Name, Age, Sex, Father Name, Address, WhatsApp Phone Number, and Chief Complaints) were asked and noted. Patients were informed that they would receive a call from the Doctor after 11:00 AM. The registered patients' list was passed on to the Doctors. Doctors would call back the patient through video call/audio call/normal call. After consultation, the doctor's prescription was scanned and sent through WhatsApp to the patient's mobile phone. In case WhatsApp was not available with the patient, a text message prescription was sent (Flowchart 1).

In the second approach (design II) (group II), an app (AIIMS Mangalagiri e-Paramarsh) was developed by CDAC (Centre for Development of Advanced Computing) and activated for consultation by the patients. In this approach, patients were required to download the e-Paramarsh App (CDAC Ltd India) available free-of-cost in their android phone. Once activated, patients were required to log in on the app through the patient login portal by entering the personal phone number which would be authenticated by an OTP. The registration would now start with filling of basic details and selecting the department of choice similar to the details that were asked in phone-based registrations. A column to enter the chief complaints was also provided. Though there was no time limit to app-based registration, it was informed to the patients to register from 9:00 AM to 11:00 AM for the convenience of delivering health services smoothly. Doctor would then log in with Doctor Login ID of the institute, accept the registration requisition raised by the patient, and then call back through the app. e-Prescription would be generated by entering the details on the prescription page. After confirmation by the doctor, the prescription was sent to the patient for download through the same app (Fig. 1 and Flowchart 2).

The details were made available for both modalities of electronic consultation (e-consultation) on our website (www.aiismmangalagiri.edu.in). We have advertised these services to public through various communication media such as newspaper, All India Radio announcements, and sharing as social media status. The details were also uploaded on websites and newspapers in the local language for better reception by the public. Teleconsultation services were provided free-of-cost to all patients in both the modalities. In addition to consultation, COVID-19-related health education material was also provided on request. Doorstep Blood investigation facility was also arranged, wherein a dedicated and well-equipped vehicle was allocated to visit the residence of patients residing within 10 km radius of AIIMS hospital campus for the collection of blood samples. However, these investigations were charged as per the rates being charged in OPD laboratory.

Flowchart 1: Patient registration process through telephone calls

The details were electronically recorded in the hospital information management system of AIIMS Mangalagiri.

RESULTS

Data from 15th April 2020 to 26th May 2020 (6 weeks), i.e., during complete lockdown period, were recorded and analyzed.

A total registrations of 1,836 patients were received during this period (group I: call-based e-Paramarsh registration was 1,598 and group II: app-based e-Paramarsh 238). Of 1,598 call-based e-Paramarsh registrations, 210 were registered during the pilot phase and 1,388 in the subsequent department-specific telephone registrations. Among call-based e-Paramarsh registrations, 867 (54.25%) were male and 731 (45.25%) were female, and of 238 app-based registrations, 134 (56.3%) were male and 104 (44.7%) were female. The age distribution of patients was done in the following age groups: 0–12, 13–55, and >55 years (Fig. 2). The maximum patients of 77.5% in group I and 81.2% in group II were between 13 and 55 years of age. Maximum registration was done for consultation of general physician followed by dermatologist (Table 2).

The total number of steps required to be followed by the patient for registration and call back from consultant in call based e-Paramarsh registration was 3 and in app-based registration was 8.

There were a total of 41 missed consultations (12 in group I call-based e-Paramarsh registrations and 29 in group II app-based

registrations). This difference was statistically significant ($p < 0.05$). These patients were either not available when the call back was done or their number was not reachable due to network issue.

DISCUSSION

Teleconsultation is a general term for any consultation between doctors or between doctors and patients on a network or video link (e.g., face time, intranet, Internet, Skype, etc.).⁵ "Remote consultation" is the superior term of teleconsultation in Medical Subject Headings and is defined as "Consultation by remote telecommunications, generally for the purpose of diagnosis or treatment of a patient at a site remote from the patient or primary physician."⁶ Although bridging the existing geographical gap for easy access to standardized healthcare is the primary goal of teleconsultation, the definition can be extended to include the current scenario of coronavirus pandemic, wherein the patients

are unable to access the healthcare facility for routine check-up due to the lockdown imposed to control the spread of COVID-19 infection. Social distancing being one of the prime measures to fight COVID-19 pandemic, teleconsultation is helping in maintaining this social distance and thus is growing as a key technology for safe and efficient healthcare delivery. The World Health Organization has mentioned telemedicine among essential services in "strengthening the Health Systems Response to COVID-19" policy.⁷

Numerous institutes and hospitals across the country have offered teleconsultation services via mobile phone app. We at AIIMS Mangalagiri have implemented teleconsultation services via department-specific teleconsultation in addition to the app-based e-consultation.

The total registrations through call-based e-Paramarsh (87.03%) were significantly higher as compared to app-based registration (12.97%). This can be explained by the fact that though the world is technologically more advanced, the learning curve of the app usage and online filling of details is still steep. Hence, people prefer to adopt easier means of registration.

Ease of use, time required, and number of steps to complete the registration are all important factors to provide an user-friendly approach to patients. Call-based e-Paramarsh appeared to be a more user-friendly mode of registration as it took a mere three-step process without requiring app download, activation by OTP, and online self-filling of details. The ease of registration process via call-based e-Paramarsh has clearly reflected a major advantage in teleconsultation.

The access to telephone numbers and app registration was provided throughout the country as is the feature of most app-based teleconsultations. Most of the patients were from Andhra Pradesh, demonstrating the locally well-developed patient-doctor relationships (Fig. 3). Though there was a huge numerical difference in the areawise distribution among the two groups, there was no statistically significant difference in the patient registrations from outside Andhra Pradesh in either groups (group I: 2.8%; group II: 0.8%, $p = 0.24$).

Fig. 1: Description of app

Flowchart 2: Patient registration process through app

Fig. 2: Age-wise distribution

Table 2: Registered patient characteristics in the two study groups

	Call-based e-Para-marsh	App-based e-Para-marsh
Total registration (n)	1598 (n1)	238 (n2)
Gender		
Male	867 (54.25%)	134 (56.3%)
Female	731 (45.75%)	104 (43.7%)
Age group		
0-12 years	88(5.5%)	8 (3.3%)
13-55 years	1239(77.5%)	193 (81.2%)
>55 years	271(16.9%)	37 (15.5%)
Department with maximum consultation hits		
General medicine	362 (22.65%)	65 (27.3%)
Dermatology	283 (17.7%)	50 (21%)
Missed consultation	12 (0.7%)	29 (12.18%)

Department-specific consultation was the biggest advantage provided in our teleconsultation services (Fig. 4). In most of the apps for free teleconsultation across the country, direct access to specialist doctor is limited. This may lead to delay in diagnosis and patient dissatisfaction, compelling the patient for further consultations.

The trend of registrations—ever since the consultation services went online, many were not satisfied with the idea of not visiting the doctors.⁸ However, with proper propagation of its potential benefits, there has been a surge in e-consultation especially for lifestyle-modifying diseases where the physical examination is not deemed necessary. We have started teleconsultation services after ensuring proper publicity, and hence, the initial registrations were at a higher range. The total patient registrations have ever since decreased and have reached a stage where the registrations are nearly constant in both the modalities of teleconsultation (Fig. 5). The possible rationale behind this observation could be the fact that patients who had no access to routine hospital visits during lockdown were given the opportunity to contact their doctors for follow-up on their investigation reports and further consultations. This resulted in clearing of the backlog of follow-up cases. Gradual reduction in the number of strict lockdown red zones allowed the patients to access healthcare facility in nearby available dispensary

Fig. 3: District-wise distribution of patient registrations in Andhra Pradesh. Others include registrations outside Andhra Pradesh

and clinics. Hence, e-consultation was less sought after and the daily registrations gradually decreased with time.

The major limitation of e-consultation during the lockdown period was investigating the patient by blood tests and scans. Though the provision was made by AIIMS Mangalagiri to perform doorstep sample collections and deliver reports of blood investigations to nearby patients, performing scans were still limited. Though there was no network-related issues encountered, there were instances of multiple registrations by the same patient due to delay in confirmation of registrations through the app. The privacy of patients was taken care by single-point registration and return call. However, the tablet device was guarded by an open password which was available to multiple doctors of the same department who used the device on different days for consultation that resulted in old patient information available to all doctors.

CONCLUSION

It is a known fact that online consultation is an interim solution and not a replacement to conventional consultation. Though the services offered by teleconsultation are limited in the situation of COVID-19 disaster, it is nonetheless a convenient mean of delivering healthcare services to the public at large. It is also a means by which screening for COVID-19 symptoms, health check-up, health updates, and health education could be provided. In our experience, e-consultation through call-based registration fared better than app-based registration. The user-friendly nature of call-based registration design has made it a popular approach among our patients.

We strongly recommend the use of e-consultation services by the patients in the current scenario of COVID-19 scare, thus helping the nation fight the dreadful infection by preventing its spread. We at AIIMS Mangalagiri are looking forward to contribute further by improvising the teleconsultation services, resolving the drawbacks

Fig. 4: Departmentwise registration of patients. Call-based e-Paramarsh (group I) registrations were more than app-based (group II) registrations. Highest registrations were done for consultation of General Physician followed by Dermatologist and lowest was for the Department of Psychiatry

Fig. 5: Comparative trend of daily registration in both groups. A plateau number reached after third week in the both modalities. *Statistically significant ($p < 0.05$) differences between two groups of registration modalities

and limitations with innovative ideas and taking this initiative further so as to benefit more and more patients.

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