

Original Articles

Video consultations from an Indian academic hospital: First 3 years of experience from telepsychiatric after-care clinic

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ABSTRACT

Background. Continuity of care for psychiatric disorders by conventional in-person consultation by psychiatrists is associated with several challenges. There is a need to develop alternative models of specialist care. We studied our 3 years' experience of live video consultations (VCs) from the tele after-care clinic to patients with psychiatric disorders at an Indian academic hospital.

Methods. We did a file review of 669 VCs provided to 213 patients in the first 3 years (2017–2019) from the telemedicine centre of a tertiary care academic hospital. We analysed details of sociodemography, clinical profile, tele after-care consultations and outcome.

Results. Two hundred and thirteen patients (55% men) were enrolled for the tele after-care clinic. The mean (SD) age of the patients was 42.2 (17.29) years and a majority were educated till high school and beyond. Patients with severe and common mental disorders constituted 60.1% and 40%, respectively. Among the total 669 appointments, 542 (81%) VCs were successfully provided; of the remaining, 125 were cancelled and 2 were aborted due to a medical

emergency. Medication prescriptions were unchanged in 499 and modified/totally changed in 47 VCs.

Conclusion. Our large study shows that telepsychiatric after-care is a useful alternative method which can supplement in-person follow-up. Barriers such as distance, cost and medical illness can be overcome using tele after-care clinics for regular follow-ups in stabilized psychiatric patients. There is a need for prospective studies, preferably, randomized controlled trials comparing effectiveness of tele after-care with in-person consultations to assess treatment outcomes.

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INTRODUCTION

Most psychiatric disorders are chronic with relapsing and remitting course and are comparable to non-communicable diseases (NCDs).¹ Similar to NCDs, psychiatric disorders too require patients to be on long-term regular medications with periodic consultations. Patients who adhere to medications and regular follow-up are known to have better outcomes.^{2,3}

A new 'concept of care' being studied in NCDs is 'continuity of care' (COC), which is also applicable to psychiatric disorders.^{4,5} However, only one-third of psychiatric patients are reported to successfully undergo follow-up at psychiatric hospitals/clinics and two-thirds are lost to follow-up.^{6,7} The reasons for poor follow-up rates include distance to healthcare centre, financial constraints, inconvenience, long waiting period, loss of pay/earning, absenteeism and poor knowledge of illness. There is a need to develop alternative models to ensure COC, preferably one which can be availed from the patient's residence itself.

One way to ensure COC is the use of video conference-based telemedicine. So far, telepsychiatry-based patient care was delivered in India in a live collaborative video consultation (VC) mode (psychiatrists provided consultation from a distance to patients who are connected with doctors or paramedical staffs such as nurses, pharmacists, etc.) to outpatients and inpatients.^{8–12} In another delivery model known as 'Direct VCs (DVCs)', specialists directly provide consultation to patients. There is a paucity of research related to DVCs.

A recent first-of-its-kind single consultation-based pilot

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study of DVC reported a higher level of 'acceptability, feasibility, possible clinical effectiveness and cost-benefit' of VCs from a telepsychiatric after-care (TAC) clinic for recently discharged inpatients (not for first consultations) from the Tele-Medicine Centre, Department of Psychiatry, National Institute of Mental Health and Neurosciences (NIMHANS), Bengaluru.¹³ After this successful pilot study, TAC was continued as the psychiatrist-based service delivery model for both outpatients and inpatients. We did a file review of our first 3 years' experience (2017–2019) with 669 consecutive live VCs from the TAC clinic for 213 adult psychiatric patients to understand the sociodemographic and clinical profiles of patients. We also reviewed the outcome of VCs.

METHODS

This study was conducted at the TAC clinic of the Tele-Medicine Centre in NIMHANS, Bengaluru. The study was approved by the institute's ethics committee. TAC is a psychiatrist-based teleclinic in which VCs are provided for the purpose of follow-up (it is psychiatrist-based and only the treating psychiatrist can choose patients for this clinic. The patient cannot ask for this facility).

We did a file review for all adult psychiatric outpatients and inpatients referred for the TAC clinic. The unique hospital identity number (UHID) of these patients was obtained from the TAC clinic register. Using the UHID, the medical records of these patients were traced and reviewed by a qualified staff involved in day-to-day running of the TAC clinic.

A semi-structured data collection sheet was designed for this study and data related to sociodemographic details, clinical profile, reason for referral and TAC clinic outcomes were extracted from the file records. Consultation-wise data of each TAC were converted into summary variables of TAC clinic outcome for ease of understanding and write-up. The data collected were tabulated and analysed using appropriate descriptive statistics.

The TAC clinic is equipped to provide VCs free of cost from the state-of-the-art studios of the Tele-Medicine Centre, Department of Psychiatry, NIMHANS, to Indian nationals who are already registered with a medical record file since January 2017. This clinical service has been provided to patients at their choice of location preferably their homes (converting hospital visit to home care). It also has a provision for the caregiver/family member to join VCs from a location other than the location of the patient. These services are provided only to patients who have had detailed in-person evaluation and require non-emergency routine follow-up care, mostly prescription refill type of follow-ups. The Tele-Medicine Centre functions as an aggregator for the TAC clinic and coordinates between the patient and the treating psychiatric team.

The functioning of the TAC clinic is simplified in three consecutive phases. In the pre-consultation phase, the treating team selects the patient (a general guideline is prepared for this purpose) and refers to the TAC clinic after obtaining written informed consent. After verifying the identity of the patients at the Tele-Medicine centre with a valid photo identity, a TAC consult is scheduled and a trial run is conducted with the patient and/or the family. The consent emphasizes the limitations of the clinical team as it has to rely on the service provider's privacy, security and encryption of the VC platforms. Another important aspect covered in the consent form is the right to abort TAC consultations when, in the opinion of the treating psychiatrist,

these are not feasible. In the consultation phase, the telemedicine staff reminds the patient a day before to ensure smooth conduct of the VC on the following day. On the day of the TAC clinic appointment, patients are sent the VC details 15 minutes before the scheduled appointment. Various platforms are used for the VCs.

The VC is done by a telepsychiatrist from the same treating team. The consultation details and prescriptions are documented in the patients' medical records obtained from the medical record department a day in advance. The treating psychiatrist asks for scheduling the next appointment if required. Post-consultation, a scanned copy of the original prescription is sent to the registered email of the patient with the next appointment date and time. The VCs are neither recorded nor stored and are indicated only for non-emergency routine follow-up. The decision to provide TAC depends on many factors including but not limited to the patient's geographical location, type of illness, severity of illness, past history and other coexisting medical illnesses. Further technical and procedural details of the TAC clinic have been published previously.¹³

We used the findings of an earlier pilot study of benefits for patients (in terms of travel time, distance and cost) to estimate the benefit for total number of VCs from the TAC clinic provided in this study.

RESULTS

During the study period, 213 patients (55% men) were enrolled for the TAC clinic. The mean (SD) age of the patients was 42.2 (17.29) years. Among them 127 were married, a majority (70%) had education till high school and beyond, 40% were fully employed, 97% belonged to the middle socioeconomic status and 81% were from urban areas (Table I). Patients from 23 different states were enrolled in our study; the majority were from West Bengal and the mean distance of patient's residence from NIMHANS was around 1650 km (Table I).

The primary psychiatric diagnoses in our sample were psychotic spectrum (63; 30%), depressive disorders (45; 22%), bipolar disorder (41; 20%), dementia (21; 10%), anxiety disorders (21; 10%), obsessive-compulsive disorder (9; 4%), neuro-psychiatric conditions (4; 2%) and others (5; 2%). Another psychiatric disorder was present in 22% of patients. Among 213 patients, 35% of patients had at least one and 11% had more than one medical illness (Table II).

Most patients were on psychotropic drugs similar to previous evaluation by the treating psychiatrists. Among them, 45%, 34%, 12%, 4% and 5% were on atypical antipsychotics, antidepressants, mood stabilizers, typical antipsychotics and other psychotropic drugs (Table II), respectively. More than one psychotropic drug was being taken by 92 patients (Table II).

There were few reasons for choosing TAC from the patient's and treating team's perspective. The most common reason for choosing TAC from the patient's perspective was distance (70%; Table III). In some patients there was more than one reason.

The total number of TAC clinic appointments fixed during the study period was 669. Of these, 125 (18.7%) were cancelled. Of the total 542 successfully completed, 2 VCs were aborted as patients expressed suicidal thoughts and the patients were asked to contact the nearby psychiatrist/reach NIMHANS (Table IV). The majority of patients (44%) had only one VC. Two or three VCs were provided to an almost equal number of patients. The mean (SD) duration between the first and last

TABLE I. Sociodemographic data of patients

Item	Frequency, <i>n</i> (%)
<i>Gender</i> (<i>n</i> =213)	
Male	117 (54.9)
Female	96 (48.1)
<i>Mean (SD) age (years)</i> (<i>n</i> =209)	42.2 (17.3)
≤20	15 (7.2)
21–30	60 (28.7)
31–40	39 (18.7)
41–50	18 (8.6)
51–60	31 (14.8)
>60	46 (22.0)
<i>Education</i> (<i>n</i> =209)	
Postgraduate	33 (15.8)
Graduate	104 (49.8)
Pre-university	13 (6.2)
High school	38 (18.2)
Primary	14 (6.7)
Illiterate	7 (3.4)
<i>Marital status</i> (<i>n</i> =209)	
Single	78 (37.3)
Married	127 (60.8)
Separated	2 (0.96)
Divorced	2 (0.96)
<i>Occupation</i> (<i>n</i> =207)	
Employed	83 (40.1)
Home-maker	45 (21.7)
Student	38 (18.4)
Retired	29 (14.0)
Unemployed	12 (5.8)
<i>Socioeconomic status</i> (<i>n</i> =209)	
Middle	201 (96.2)
Higher	8 (3.8)
<i>Residence</i> (<i>n</i> =207)	
Rural	40 (19.3)
Urban	167 (80.7)
<i>State of residence</i> (<i>n</i> =208)	
West Bengal	63 (30.3)
Karnataka	27 (13.0)
Bihar	21 (10.1)
Andhra Pradesh	17 (8.2)
Madhya Pradesh	14 (6.7)
Odisha	10 (4.8)
Other states	56 (3.4)
<i>Mean (SD) distance from NIMHANS (km)</i> (<i>n</i> =208)	1656.62 (960.49)
≤500	33 (15.9)
501–1000	27 (13.0)
>1000	148 (71.2)

consultation (calculated for 104 patients who had undergone more than one VC) was 95 (131.3) days. The mean (SD) number of TAC clinic consultations per patient was 2.54 (2.62), and the mean (SD) duration of each session was 19.9 (5.69) minutes. In terms of symptoms, in comparison with their previous consultation (*n*=180), 163 patients (91%) continued to improve while the condition of 8 patients (5%) worsened. During the study period, 15 (7%) VCs noted adverse effects. Investigations were advised in 20 (4%) VCs. Medication prescriptions were completely changed/modified in 47 (8%) VCs (Table V).

We estimated substantial savings of time and cost from the patient's perspective for the 542 successful VCs by using the findings from our earlier study (Table VI).

TABLE II. Clinical details of enrolled/recruited patients

Item (analysed/missing data)	Frequency, <i>n</i> (%)
<i>Primary diagnosis</i> (209/04)	
Psychotic spectrum (SCZ, psychosis NOS)	63 (30.14)
Depressive disorders	45 (21.53)
Bipolar disorder	41 (19.62)
Dementia	21 (10.05)
Anxiety disorders	21 (10.05)
Obsessive–compulsive disorder	9 (4.31)
Neuropsychiatric conditions (TBI/Parkinson)	4 (1.91)
Mania	1 (0.48)
Attention deficit disorder	1 (0.48)
Personality	1 (0.48)
Substance abuse	2 (0.96)
<i>Comorbid psychiatric diagnosis</i> (<i>n</i> =46)	
Depressive disorder	13 (28.26)
Psychosis	12 (26.08)
Obsessive–compulsive disorder	6 (13.04)
Substance dependence	4 (8.69)
Parkinson	3 (6.52)
Anxiety disorder, Alzheimer and somatoform disorder	2 each (4.34)
Panic attack and mania	1 each (4.34)
<i>Comorbid illness</i> (<i>n</i> =74)	
Hypertension	23 (11)
Diabetes mellitus	20 (9.57)
Hypothyroidism	21 (10.05)
Epilepsy	4 (1.91)
Other illness	6 (2.81)
Rheumatoid arthritis	2 (0.96)
Cancer	1 (0.48)
Cardiac illness	1 (0.48)
Anaemia	1 (0.48)
Neurological	1 (0.48)
<i>More than 1 comorbid illness</i> (24 of 74)	
Hypertension	10 (13.51)
Hypothyroidism	6 (8.10)
Cardiac illness	4 (5.40)
Diabetes mellitus	2 (2.27)
Benign prostatic hypertrophy	1 (1.37)
Epilepsy	1 (1.37)
<i>Primary psychotropic medication</i> (<i>n</i> =201), <i>nil pharmacotherapy</i> in 12 patients	
Atypical antipsychotics	90 (44.78)
Antidepressants	68 (33.83)
Mood stabilizers	24 (11.94)
Typical antipsychotics	8 (3.98)
Memantine	5 (2.49)
Benzodiazepines	4 (1.99)
Donepezil	1 (0.50)
Syndopa	1 (0.50)
<i>Second psychotropic medication</i> (<i>n</i> =92)	
Antidepressants	26
Atypical antipsychotics	24
Benzodiazepines	19
Mood stabilizers	9
Anticholinergics	7
Memantine	3
Typical antipsychotics	2
Donepezil	1
Syndopa	1

SCZ schizophrenia NOS not otherwise specified TBI traumatic brain injury

TABLE III. Reason for choosing telepsychiatric after-care from patient's perspective (n=198)

Reason	n (%)
Convenience	29 (14.7)
Academic	1 (0.5)
Cost	29 (14.7)
Distance	139 (70.2)

TABLE IV. Outcome of telepsychiatric after-care consultations of 213 patients

Outcome	n (%)
Appointment fixed after consent	669
Cancellation	125
<i>Reason for cancellation (data for 89 consultations available)</i>	
Technical reasons	9
Not able to contact the patients 80 (include 16 nil consultations)	
Aborted video consultation	2
Number of successfully conducted video consultations	542

TABLE V. Details of 542 successfully conducted telepsychiatric after-care (TAC) video consultations for 213 patients

Parameter	Mean (SD)/frequency (%)
<i>Duration</i>	
Time between first and last TAC (calculated for 104 patients who had more than one TAC consultation)	95.0 (131.3)
Average duration of each TAC (minutes)	19.9 (5.69)
<i>TAC consultations per patient</i>	
Mean (SD)	2.54 (2.62)
0	16 patients (7.5)
1	93 patients (43.7)
2	39 patients (18.3)
3–6	46 patients (21.6)
7–10	12 patients (5.6)
>10	7 patients (3.3)
<i>General impression of psychopathology (n=180)</i>	
Improved	163
Status quo	9
Worsened	8
Side-effects observed in any TAC (tremors, sedation, weight gain, etc.)	15
Investigation asked in any TAC	20 (3.69)
<i>Medication prescribed</i>	
Continued same medications	495 (91)
Medications changed	47 (8)
Scanned prescriptions sent	322 (59.4)
<i>Interim in-person consultations of patients</i>	
At NIMHANS	12
Outside (mainly for medical reasons for diabetes, hypertension)	14
Interim admission occurred (admissions for medical reasons)	2

TABLE VI. Estimated savings on visits avoided by 542 successful video consultations

Item	Previous study ¹³	In this study
Travel distance (km)	1683	912 186
Travel time (hours)	31.21	16 915
Travel cost (₹)	13 256	7 184 752
Food and stay charges (₹)	20 036	10 859 512

DISCUSSION

We believe our large study of VCs for follow-up of patients with psychiatric disorders is probably the first of its kind. Telemedicine was started nearly two decades ago in India as a collaborative pilot study by Apollo Hospitals, Chennai and the Indian Space Agency for cancer patients in rural areas.⁸ However, the growth of telemedicine in India has been slow.

There are few studies on VC in healthcare delivery. Nesbitt *et al.* reported higher satisfaction among patients and primary care physicians from 1000 VCs across specialties.¹⁴ A cross-sectional study from Hyderabad among 122 participants (71 patients and 51 doctors) on satisfaction in quality of service, cost-effectiveness and problems encountered in healthcare provided by telemedicine in Apollo Tele Health Services found that nearly 80% of patients and all the doctors were satisfied about the quality of treatment given through telemedicine. Approximately 90% of the participants found telemedicine cost-effective. Telephone, email or video conversation was the method used for service delivery.¹⁵ In our earlier study, we have reported on the feasibility and acceptance of TAC consultations in the initial 50 VCs.¹³

We enrolled adult patients for the TAC clinic. We found that 669 TAC appointments were fixed in 3 years and 542 VCs (81%) were completed successfully. This indirectly suggests acceptability and feasibility of VCs for regular follow-up of patients. The psychiatric diagnosis in the majority of our sample was related to severe mental disorders. Despite a selection bias, VCs are feasible even in patients with another psychiatric disorder and with another medical illness, suggesting that real-world patient populations would be suitable for TAC clinics. We could also satisfactorily conduct VCs including prescriptions for psychotropics for almost all our patients.

India has made rapid strides in the field of digital technology in the past decade. It has become an integral part of life even in remote places in the form of smartphones and high-speed internet connectivity. We did not collect data about the patient's preferred device for participation in VCs. It is likely that over time smartphones would be the preferred choice of patients. Future studies should focus on smartphone-based VCs.

Jacobs *et al.*¹⁶ reported huge savings of time and money from teleconsultations. We estimated substantial savings of time and money by the use of VCs—about 16 000 travel hours covering nearly 900 000 km and about ₹18 million (₹1.8 crore) was saved by these patients. Considering India is a resource-constrained country, saving by the use of telemedicine for routine follow-up should be explored further at all healthcare set-ups.

The findings of this study should be read in the context of the 'Telemedicine Practice Guidelines: Enabling registered medical practitioners to provide healthcare using telemedicine' released on 25 March 2020.¹⁷

To summarize, the TAC clinic was successfully used in our study in place of in-person consultation for follow-up of stable patients with psychiatric illnesses. Patients either with common or severe mental disorders were able to use this service. The age, education, background, locality, diagnosis and presence of comorbid medical illnesses were not barriers for the use of predominantly smartphone-based VCs of the TAC clinic.

Limitations

The retrospective design, focused only on COC, and with lack of details about the patients preferred device for VCs were the

few limitations. The estimation of time, food charges and travel was based on previous findings and may not be accurate.

Future directions

There is a need to develop standard of care for video-based psychiatric consultations, even for first consultations. Future studies should use the Telemedicine Practice Guidelines (March 2020), to work on clinician-friendly, do-it-yourself, electronic health record and integrated VCs with automated prescription sending even from small clinic-based physicians.

Conclusions

This large study of VCs for routine follow-up of selected patients across psychiatric disorders showed acceptability and feasibility to provide VCs using current available devices and digital technology. The use of VCs for follow-up could save a lot of money and travel time. This study can be generalized to other specialties and even primary care doctors.

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Conflicts of interest. None declared

REFERENCES

- O'Neil A, Jacka FN, Quirk SE, Cocker F, Taylor CB, Oldenburg B, *et al.* A shared framework for the common mental disorders and non-communicable disease: Key considerations for disease prevention and control. *BMC Psychiatry* 2015;**15**:15.
- Sfetcu R, Musat S, Haaramo P, Ciutan M, Scintee G, Vladescu C, *et al.* Overview of post-discharge predictors for psychiatric re-hospitalisations: A systematic review of the literature. *BMC Psychiatry* 2017;**17**:227.
- Kumar CN, Thirthalli J, Suresha KK, Venkatesh BK, Arunachala U, Gangadhar BN. Antipsychotic treatment, psychoeducation regular follow up as a public health strategy for schizophrenia: Results from a prospective study. *Indian J Med Res* 2017;**146**:34–41.
- Wagner EH. Chronic disease management: What will it take to improve care for chronic illness? *Eff Clin Pract* 1998;**1**:2–4.
- Biringer E, Hartveit M, Sundfjor B, Ruud T, Borg M. Continuity of care as experienced by mental health service users—A qualitative study. *BMC Health Serv Res* 2017;**17**:763.
- Jain N, Arya S, Gupta R. Predictors of dropout from outpatient mental health services; a study from Rohtak, India. *J Neurosci Rural Pract* 2017;**8**:535–9.
- Grover S, Dua D, Chakrabarti S, Avasthi A. Dropout rates and factors associated with dropout from treatment among elderly patients attending the outpatient services of a tertiary care hospital. *Indian J Psychiatry* 2018;**60**:49–55.
- Thara R, John S, Rao K. Telepsychiatry in Chennai, India: The SCARF experience. *Behav Sci Law* 2008;**26**:315–22.
- Thara R, Sujit J. Mobile telepsychiatry in India. *World Psychiatry* 2013;**12**:84.
- Singh AP, Shanker Joshi H, Singh A, Agarwal M, Kaur P. Online medical consultation: A review. *Int J Community Med Public Health* 2018;**5**:1230–2.
- Gowda GS, Kulkarni K, Bagewadi V, Rps S, Manjunatha BR, Shashidhara HN, *et al.* A study on collaborative telepsychiatric consultations to outpatients of district hospitals of Karnataka, India. *Asian J Psychiatr* 2018;**37**:161–6.
- Khanna M, Gowda GS, Bagevadi VI, Gupta A, Kulkarni K, Shyam RP, *et al.* Feasibility and utility of tele-neurorehabilitation service in India: Experience from a quaternary center. *J Neurosci Rural Pract* 2018;**9**:541–4.
- Das S, Manjunatha N, Kumar CN, Math SB, Thirthalli J. Tele-psychiatric after care clinic for the continuity of care: A pilot study from an academic hospital. *Asian J Psychiatr* 2020;**48**:101886.
- Nesbitt TS, Hilty DM, Kuenneth CA, Siefkin A. Development of a telemedicine program: A review of 1,000 videoconferencing consultations. *West J Med* 2000;**173**:169–74.
- Acharya RV, Rai JJ. Evaluation of patient and doctor perception toward the use of telemedicine in Apollo Tele health services, India. *J Family Med Prim Care* 2016;**5**:798–803.
- Jacobs JC, Hu J, Slightam C, Gregory A, Zulman DM. Virtual savings: Patient-reported time and money savings from a VA National Telehealth tablet initiative. *Telemed J E Health* 2020;**26**:1178–83.
- Board of Governors in Supersession of the Medical Council of India. Telemedicine Practice Guidelines-Enabling Registered Medical Practitioners to Provide Healthcare Using Telemedicine; 2020. Available at www.mohfw.gov.in/pdf/Telemedicine.pdf (accessed on 4 Apr 2020).