



## A study of collaborative telepsychiatric consultations for a rehabilitation centre managed by a primary healthcare centre

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**Background & objectives:** Telepsychiatric methods can be used for the purpose of providing clinical care comparable to in-person treatment in various settings including rehabilitation. Previous evidence has shown that clinical outcomes for both are comparable. In view of challenges posed in the implementation of traditional psychiatric care in India, telepsychiatry offers an avenue to provide feasible, affordable and clinically useful psychiatric services. This study was conducted to examine the utility, feasibility and clinical effectiveness of providing collaborative telepsychiatric services with a primary care doctor for inpatients in a rehabilitation centre through a telepsychiatrist of established psychiatry department in a tertiary care centre in south India in a collaborative care model with a primary care doctor.

**Methods:** Patients at the rehabilitation centre attached to an urban primary healthcare centre received collaborative care using telepsychiatry for a period from January 2013 to December 2016. A retrospective review of their charts was performed and sociodemographic, clinical and treatment details were collected and analyzed.

**Results:** The sample population (n=132) consisted of 75 per cent males, with a mean age of  $43.8 \pm 12.1$  yr. Each patient received an average of  $7.8 \pm 4.9$  live video-consultations. Initially, an antipsychotic was prescribed for 84.1 per cent (n=111) of patients. Fifty four patients (40.9%) had a partial response and 26 (19.7%) patients showed a good response.

**Interpretation & conclusions:** The study sample represented the population of homeless persons with mental illness who are often brought to the rehabilitation centre. This study results demonstrated the successful implementation of inpatients collaborative telepsychiatry care model for assessment, follow up, investigation and treatment of patients through teleconsultation.

**Key words** Collaborative care - India - psychiatric service - rehabilitation - telepsychiatry

Telepsychiatry refers to the practice of providing or supporting psychiatric care at a distance using information communication technology. These

methods can be utilized for clinical care, education, administration and research purposes in psychiatry. Services can be provided to patients, providers and

communities which are comparable to in-person care<sup>1-3</sup>. Thus, it can be used in diverse settings for different age and ethnic groups<sup>4,5</sup>.

It has been demonstrated that telepsychiatric services are becoming increasingly accessible and cost-effective<sup>6</sup>. They provide a reliable alternative to the more resource-intensive in-person psychiatric consultation services, particularly in resource-poor settings<sup>7</sup>. Clinical outcomes have been found to be comparable with no significant difference between the modalities with some patients identifying telepsychiatric consultation as their preference over in-person consultations<sup>5,8,9</sup>. There is a sizable gap between its potential and its actual use as it is not widely used, particularly in developing countries<sup>10</sup>. Along with its obvious advantages of saving time, money and travel, it also offers the benefits of patient satisfaction with outcomes suggestive of adequate treatment adherence, symptom management and quality of life<sup>11,12</sup>. Studies of urban telepsychiatry have identified unique challenges in its practice, particularly in diverse settings such as schools, daycare centres and in-patient settings with linguistically and ethnically diverse populations<sup>13,14</sup>. Its feasibility and acceptability has also been demonstrated in settings of primary care, acute care, chronic illness care and with immigrant populations<sup>15-19</sup>.

The Schizophrenia Research Foundation in Tamil Nadu in India has been conducting the delivery of telepsychiatric services through teleconsultations in seven peripheral units across the State along with the use of mobile telepsychiatry<sup>20-22</sup>. Another study which used an asynchronous/store-and-forward model of telepsychiatric care in Maharashtra has found that challenges of infrastructure and funding can also be overcome using a more basic but still feasible model of service delivery<sup>23</sup>. A telepsychiatric screening tool developed by Malhotra *et al*<sup>24,25</sup> was demonstrated to be useful for screening and diagnostic purposes. The same group has developed a telepsychiatric clinical decision support system for use by non-psychiatrists in peripheral centres for diagnosis and for guiding treatment decisions<sup>26</sup>. While telepsychiatry in India offers the promise of improving accessibility and closing treatment gap in psychiatric illness, models of telepsychiatry feasible and suitable to the Indian setting need to be evolved<sup>27-29</sup>. Another important concern remains cost-effectiveness of the models being used. A study from the National Institute of Mental Health and Neurosciences (NIMHANS), Bengaluru,

India, demonstrated that the costing for the use of telepsychiatric services which eliminated the logistics of travel for the mental health team proved economical and feasible<sup>30</sup>. A comparative review described the hub-and-spokes model used at NIMHANS for the provision of these services<sup>31</sup>.

The Indian mental health legislations including the National Mental Health Policy (2014)<sup>32</sup> as well as the Mental Healthcare Act of 2017<sup>33</sup> identified the right to access rehabilitation services as one of the important rights of persons with psychiatric disorders. We did a retrospective file review of inpatients at the Nirashritara Parihara Kendra (NPK) who were assessed and treated using teleconsultations at NIMHANS. The aim of this study was to examine the utility, feasibility and possible clinical effectiveness of providing telepsychiatric services for inpatients at the NPK.

### Material & Methods

The NPK in Bengaluru, India, is a regional rehabilitation centre for homeless persons with/without mental illness, attached to an urban primary health centre. Healthcare is provided by primary healthcare physicians who perform physical and psychiatric assessments. Referrals to psychiatrists are made after initial assessment, if a psychiatric illness is suspected. The Community Psychiatry Unit at NIMHANS provided once monthly camp-model outreach services at the NPK with telepsychiatric consultations which were started as an additional service along with camp visits from January 2013 to December 2016.

*Model of service:* A inpatient collaborative telepsychiatric care model, which used teleconsultations for evaluation and follow up care with the primary healthcare doctor of NPK, was utilized as a model of care in this study. The collaborative care model refers to the system of teleconsultations between the psychiatrist and the primary care physician in-charge of the patient at the NPK. The psychiatrist guided the in-charge primary care physician for screening, diagnosis and management of the patient with mental illness. The telepsychiatric consultations occurred in the form of a hub-and-spokes model. The hub was located at the Tele Medicine Centre under the department of Psychiatry at the NIMHANS with the participants being the consulting psychiatrists of the Community Psychiatry Unit. The spoke location was at the NPK with participants being the primary healthcare physician along with the patients for whom referral services were sought. Each consultation lasted about 10-15 min for

an initial assessment and 5-10 min for a follow up assessment.

*Patients' files:* Files were retrieved for 132 patients with a total of 1056 teleconsultations for whom inpatient telepsychiatric collaborative care was provided between January 2013 and December 2016. All patients were examined by qualified psychiatrists under the Community Psychiatry Unit at NIMHANS in addition to once-a-month in-person consultations as part of an outreach camp at NPK.

*Data collection:* A specially designed telepsychiatric consultation proforma was used to collect details such as the patients' sociodemographic data, diagnosis, treatment, investigations, follow up, referrals and improvement. Response was noted as per clinical impression as recorded in the patients' charts defined as poor (<50% improvement), partial (50-75% improvement) and good (>75% improvement) response. The institute ethical committee approved the study. Statistical Package for the Social Sciences (SPSS) version 16.0 (SPSS Inc., Chicago, IL, USA) was used for statistical analysis, and descriptive statistics were performed.

## Results

The sample population (n=132) consisted of 99 (75%) males and 33 (25%) females with a mean age of 43.8±12.1 yr. Each patient received collaborative psychiatric care through in-charge primary care physicians for an average of 7.8±4.9 teleconsultations with the mean duration between consecutive consultations being 2.1±1 months. At initial teleconsultations, most common diagnoses included unspecified non-organic psychosis in 63 (47.7%) patients, schizophrenia in 40 (30.3%) patients and psychosis with mental retardation in 16 (12.1%) patients. Less common diagnoses included psychosis with depression in five (3.8%) patients, bipolar disorder in five (3.8%) patients and mental retardation (MR) alone in three (2.3%) patients [as per the International Classification of Diseases - Tenth Revision (ICD-10)]<sup>34</sup>.

*Clinical characteristics:* Of the 132 patients, 32 were advised for testing of intelligence quotient (IQ) based on clinical presentation. The IQ test was performed for 23 patients, of whom one had borderline intelligence, seven had mild MR, 13 had moderate and two had severe MR. IQ testing was not performed for the remaining patients due to logistic reasons, however, care was continued with clinical diagnoses (Table I).

*Diagnostic revision:* A total of 13 (9.8%) patients underwent diagnostic revision over the course of teleconsultations (Table II). Nine (6.9%) patients received an additional diagnosis of mental retardation along with an initial diagnosis of psychosis. Two (1.5%) patients were found to have mental retardation alone while the diagnosis of psychosis was discarded. Of the two patients initially diagnosed with psychosis, one patient was found to have obsessive-compulsive disorder and the other had dementia.

*Comorbidity:* Tobacco use disorders were the most common comorbid condition in eight (5.8%) patients. Six patients (4.3%) had epilepsy, three (2.1%) developed dementia, whereas three patients had diabetes and one patient with hypertension (Table I).

**Table I.** Sociodemographic and clinical characteristics of patients (n=132)

Age at assessment (yr), mean±SD	43.8±12.1
Gender, n (%)	
Male	99 (75)
Female	33 (25)
Teleconsultations, mean±SD	
Mean number of consultations per patient	7.8±4.9
Mean duration between consecutive consultations	2.1±1
Diagnosis at initial consultation, n (%)	
Psychosis	63 (47.7)
Schizophrenia	40 (30.3)
Mental retardation+psychosis	16 (12.1)
Depression+psychosis	5 (3.8)
Bipolar disorder	5 (3.8)
Mental retardation	3 (2.3)
IQ testing	
IQ advised	32
IQ performed	23
Dull normal	1/23
Mild	7/23
Moderate	13/23
Severe	2/23
Comorbid medical illness, n (%)	
Hypertension	1 (0.7)
Diabetes	3 (2.1)
Seizure disorder	6 (4.3)
Substance use disorder	8 (5.8)
Dementia	3 (2.1)
IQ, intelligence quotient; SD, standard deviation	

**Investigations:** Additional investigations over and above routine baseline evaluation performed at the NPK were blood glucose, biochemistry panel including liver and kidney function tests, serum electrolytes, fasting lipid profile, complete blood count, electrocardiography (ECG) and HIV testing based on psychiatrist's advice. Fasting and postprandial blood glucose levels were asked for 42 (31.8%) patients, complete blood count for 25 (18.9%) patients, lipid profile and biochemistry panel for four (3%) patients, ECG for 24 (18.2%) patients and HIV testing for one (0.7%) patient.

**Treatment:** Initial treatment included antipsychotic drugs for 111 (84.1%) patients, four (3%) patients received mood stabilizers alone, whereas 11 (8.3%) patients received a combination of antipsychotics with mood stabilizer and six (4.4%) patients received a combination of antidepressant and antipsychotic drugs. Thirty nine (29.5%) patients required revision in initial treatment over the course of teleconsultations (Table III). Antipsychotics were stopped in six (4.5%) patients. The most commonly prescribed initial antipsychotic was risperidone in 78 (59.1%) patients, followed by olanzapine in 38 (28.8%) patients, whereas five (3.5%) patients received other antipsychotics. Mean chlorpromazine equivalents as per Danivas and Venkatasubramanian<sup>35</sup> for the prescribed antipsychotic medications were 341±163 mg. The most common antipsychotic prescribed in combination with initial antipsychotic was injectable fluphenazine (depot preparation) in 20 (15.1%). The most common mood stabilizer prescribed was valproate in 17 (12.8%) patients. Following the failure of an adequate trial of initial antipsychotic, in the next antipsychotic trials clozapine was prescribed in 24 (18.1%) patients and olanzapine for 12 (9.1%) patients (Table III).

In terms of response, 36 (27.3%) had a poor response, 54 (40.9%) had a partial response and 26 (19.7%) patients had good responses based on the last clinical notes of patients. In terms of adverse effects, 10 (7.8%) patients had adverse effects - extrapyramidal symptoms were the most common in seven (5.3%) patients. Only four (3%) patients required referral for inpatient care.

**Table II.** Psychiatric diagnostic revisions

Baseline diagnosis	Revised diagnosis	n (%)
Psychosis	Dementia	1 (0.7)
Schizophrenia	Obsessive-compulsive disorder	1 (0.7)
Psychosis/ schizophrenia	Mental retardation	2 (1.5)
Psychosis	Mental retardation + psychosis	9 (6.9)
Total diagnostic revision		13 (9.8)

**Table III.** Clinical outcome and treatment response characteristics of patients (n=132)

Variable	n (%)
Initial treatment (with collaborative care)	
Antipsychotic medication	111 (84.1)
Mood stabilizer	4 (3)
Antipsychotic medication+mood stabilizer	11 (8.3)
Antipsychotic medication+anti-depressant medication	6 (4.4)
Treatment revised	39 (29.5)
Antipsychotic medication (first trial)	
Tablet risperidone	78 (59.1)
Tablet olanzapine	38 (28.8)
Others	5 (3.5)
Antipsychotic medication prescribed in combination with	
Injection fluphenazine	20 (15.1)
Tablet valproate	17 (12.8)
Antipsychotic medication (next trial)	
Tablet clozapine	24 (18.1)
Tablet olanzapine	12 (9.1)
Chlorpromazine equivalents (mg), mean±SD <sup>35</sup>	341±163
Clinical outcome (based on clinician experience)	
<50 per cent (poor)	36 (27.3)
50-75 per cent (partial)	54 (40.9)
>75 per cent (good)	26 (19.7)
Adverse side effects	
Extrapyramidal symptoms/syndromes	7 (5.3)
Others	3 (2.3)
Referral for intensive psychiatric care at higher centre	4 (3)

## Discussion

Our sample represented the population of homeless persons with mental illness who were brought to the NPK. Women constituted only a fourth of the sample. The most common diagnoses were those of psychoses and schizophrenia representing the severe mental illnesses that have been previously shown to be associated with homelessness<sup>36-38</sup>. Intellectual disability was observed in patients initially diagnosed with psychosis or schizophrenia. Over a period of successive teleconsultations, certain patients underwent revision of their original diagnosis, receiving an additional diagnosis of mental retardation or a complete change of diagnosis for which the medication was later discontinued. In terms of management, additional investigations were requested by a telepsychiatrist for as and when required. These could then be reviewed by the primary care physician and treatment decisions taken accordingly. Nearly 20 per cent patients showed good response with another 40 per cent showing partial improvement with treatment. This finding was similar to the earlier Indian studies on homeless mentally ill persons, where it showing good response to treatment ranging from 52 to 82 per cent<sup>37-39</sup>.

The most common antipsychotics used included risperidone, olanzapine, clozapine and fluphenazine depot, reflecting availability and prescribing practices. Clinical decisions regarding changes in medication were also taken during these teleconsultations with patients receiving second or third trials of antipsychotics as advised by telepsychiatrist. Only four patients were referred for inpatient services at NIMHANS when the worsening of their clinical condition was noted by the psychiatrist.

The telepsychiatric services were provided in addition to regular once-monthly camp-based mental health services. This represents inpatients collaborative care with primary care doctors using telepsychiatric techniques. The cost-effectiveness and feasibility of this model have been previously established<sup>30</sup>. This study demonstrated its clinical usefulness and feasibility as a possible alternative for rural and underserved urban inpatient populations. As earlier studies have described, telepsychiatry represents a source of support for areas in which there is inadequate staff, support and coverage of psychiatric services<sup>16,17,19</sup>. This model of telepsychiatric care can also be replicated in remote, rural areas of the country, which can contribute to lowering costs of operating rehabilitation centres.

An important limitation of our study was that the inpatient charts of the patients, which were maintained by primary care physicians at NPK could not be accessed and reviewed and all the available information was from the telepsychiatry files of the patients maintained at Tele Medicine Centre, NIMHANS. This study was carried out at one rehabilitation centre only, and should be replicated in other rural areas of the country.

Telepsychiatric services represent a clinically useful, feasible and acceptable alternative to in-person psychiatric care in a low-income country with limited resources. The collaborative care model provides a promising alternative and needs to be evaluated in future studies.

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**Conflicts of Interest:** None.

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