# Effectiveness of Psychological Intervention by Videoconference for Family Members with Depression of Farmers Who Have Committed Suicide

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## ABSTRACT

**Background:** In India two thirds of the population is directly or indirectly dependent on agriculture. The suicide rate for farmers throughout the world is higher than the non-farming population with India being no exception. Family members of the household where a member has committed suicide are at an increased risk for depression, anxiety and suicide. There is a paucity of trained counsellors in India, while there is sufficient research showing counselling and therapy through videoconferencing is just as effective as in-person therapy. It is however, not commonly practiced in India, especially in rural settings. We propose to evaluate psychiatric morbidity and assess feasibility and effectiveness of videoconferencing for family members of farmers who had committed suicide.

**Objectives:** The objective is to evaluate family members of farmers who have committed suicide for psychiatric morbidity and psychosocial risk factors. We aim to identify depression, anxiety and suicidal risk in family members and then administer psychological intervention through video-conferencing for depression to study its effectiveness in the cohort.

**Methodology:** The data on completed farmer suicide would be collected from district authorities and police departments. Home visit would be made by research staff to assess the risk factors for the farmers who completed suicide. Family members would be screened for anxiety and depression and severity of depression and suicidal ideas would be rated. The family members having mild to moderate depression would be randomised and CBT based psychological intervention (5 sessions) over three months would be given by trained psychologist through videoconferencing. The outcome would be measured at the end of six months.

**Conclusions:** Psychological interventions through video-conference might be beneficial in the treatment of mild to moderate depression in family members of the farmers who have committed suicide.

**Keywords:** Farmer, Suicide, Depression, Teletherapy, videoconference

**Key Messages:** 1. There is a paucity in rigorous research of alternate ways delivery of treatment to alleviate the psychological burden in farmers.

2. Counselling over videoconferencing may overcome the shortage of manpower of mental health professionals in rural areas.

3. Effective use of technology in mental health will be beneficial to patients in rural areas and decrease transit time, time to first-consultation and deliver services early.

Low- and middle-income countries account for 75% of suicides world over.[1] Various social, psychological, cultural, and other factors either alone or together lead a person to suicidal behavior. Annual global age-standardized suicide rate is 11.4 per 100,000.[1] After

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road crashes for men and maternity-related complications for women as causes for death, suicide is the second main cause of death among young adults in India.[2]

Two-thirds of the population in India relies directly or indirectly on farming.[3] The suicide rate for farmers throughout the world is higher than the non-farming population with India being no exception.[4] Family members of the household where a member has committed suicide are at an increased risk for depression, anxiety, and suicide.[5] In India, farmers' suicide is highest in the state of Maharashtra followed by adjacent state, Karnataka.[6] The lack of sufficient social support systems, agricultural sector insecurity, loans, relative absence of irrigation facilities, frequent crop failures, agricultural rainfall dependency, easy access to poisons, illiteracy and inadequate knowledge, and lack of access to mental health services are significant risk factors for farmer suicide.[7,8] Family members of persons with suicide attempt are at increased risk for depression, anxiety, and suicide. Family members are likely to have genetic loading and are prone for similar mental illness of the deceased.[9] Families of persons with mental illness are likely to experience significant burden, decreased quality of life, and financial stress as a result of mental illness in that family member. Depression is more commonly seen in caregivers of mentally ill than non-caregivers.[10,11]

There are also challenges to obtaining evidence-based mental health services for rural communities. In India, we have fewer mental health providers for treating significant population with mental illness.[12] The people are less educated; many are unaware and ignorant about mental illnesses. People with mental illness fail to get treated at hospital and do not follow up because of financial problems, time spent in travelling, and loss of daily wages.[13] Psychosocial intervention for such rural population through videoconference is a promising mode of delivering intervention. It allows for both recorded and real-time clinician–patient interactions using web cameras on personal computers. Medical researchers in urban mental health facilities have identified important benefits of telehealth psychosocial interventions across a wide spectrum of psychological disorders, including anxiety, depression,[14] and mood disorder.[15]

## Objectives

To study the effectiveness of psychological intervention through videoconference for depression in family members of farmers who have committed suicide.

## Methodology

The study design would be randomized controlled trial. The subjects are 1:1 with one group which receives psychological intervention through videoconferencing against a group which only receives treatment as usual which is allocated by block randomization. The study then evaluates effectiveness of psychosocial intervention through videoconference in high-risk farmers. The second group which is a control group will be waitlist control. It is a community-based study. Study will be conducted in the rural areas of four districts of north Karnataka (Dharwad, Haveri, Gadag, and Belgaum). Study population includes high-risk group involving families of farmers in the state of Karnataka.

In the first phase, the data of farmer suicides in the last one year would be obtained from district authorities and police department. The research staff will visit the farmer's home, and collect the information related to circumstances of suicide and risk factors (financial, social, and psychological) associated with suicide. In the second phase, family members will be screened and subjects with mild and moderate depressive disorder will be identified using following tools.

## Scales and Tools Used

Social and demographic factors: An investigator-prepared pro forma will be used to record
• Socio demographic details
• Details of financial status/risk factors
• Details of social risk factors, farming activities

Participant recruitment: The internationally accepted and validated Patient Health Questionnaire (PHQ) is used as the screening tool for this study.[16] After the Junior Research Fellow (JRF) obtains consent for participation in study, the JRF administers PHQ-2. It has two items which examine the occurrence of symptoms of depressed mood and anhedonia, each of which scores 0 (not at all) to 3 (nearly every day). The purpose of PHQ-2 is for initial screening as a "first step" approach.[17] A score of ≥3 is considered as the cut-off for risk of depression and such individuals are then further evaluated with PHQ-9 by the JRF. There are nine items with a score of 0–3 for each question. A cut-off score of 5–9 is regarded as mild depression, moderate depression (10–15), moderately severe depression (15–19), and 20 or higher is regarded as severe major depression.[18] Those with a PHQ-9 score of 5–15, that is, mild to moderate depression are invited to enroll in the trial with another written informed consent taken by JRFs. Recruited participants are further interviewed with a semi-structured and pre-tested pro forma by the JRFs.

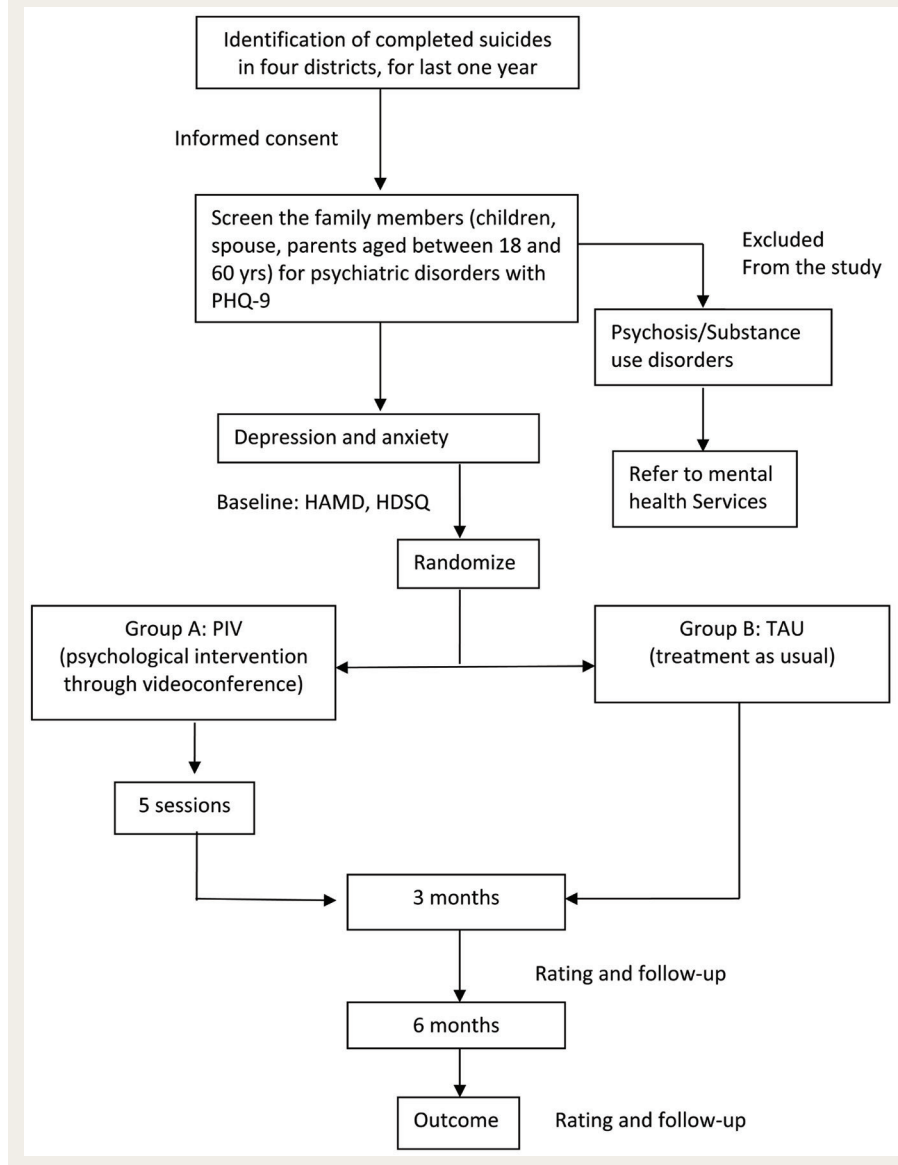**Mini International Neuropsychiatric Interview (MINI) ver. 5.0:** For identifying psychiatric morbidity

The M.I.N.I.[19] is a brief structured interview for identifying psychiatric disorders as per *DSM-IV* and *ICD-10*. It has high validity and reliability scores and can be administered in shorter period of time (15–20 minutes).

**Hamilton Rating for Depression Scale (HAM-D 17)**[20]: For rating the severity of depression and for comparing pre- and post-intervention scores of participants. Inter-rater reliability has been reported to be 0.80–0.98. Test–retest reliability has been reported to be as high as 0.81. Validity of the HAM-D has been reported to range from 0.65 to 0.90 with global measures of depression severity. By adding the score of each component which range 0–4 or 0–2, the total score is obtained. Most researchers concur that scores between 0 and 6 suggest that patient doesn't have depression, 7 and 17 show slight depression, 18 and 24 mean moderate depression, and above 24 means the patient has severe depression.

**The Hopelessness Depression Symptom Questionnaire (HDSQ):** For rating the suicidal risk and severity and for comparing pre and post intervention.[21] It contains 32 questions about hopelessness depression symptoms. The scores of every item range from 0 to 3 on the basis of severity. The subscales

**FIGURE 1.**

## Study Design: Consort Flowchart



are as follows: Motivational Deficit, Interpersonal Dependency, Psychomotor Retardation, Anergia, Apathy/Anhedonia, Insomnia, Difficulty in Concentration/Brooding, and Suicide. There is high correlation between items in the scale (0.86 and 0.91), and with other subscales ($\alpha$ = 0.70–0.86), and overall ($\alpha$ = 0.93). It has a goodness of fit index value of 0.986 which means the scale is highly valid.

In the second phase, family members who have mild to moderate depression with HAM-D score range of 8–18 will be randomized into intervention and control groups. The experimental (intervention) group will receive psychosocial intervention through videoconference by clinical psychologist in addition to requisite treatment while control group will receive treatment as usual. Family members (children, spouse, parents) of a farmer who committed suicide, aged 18–60 years, would be part of the interventional study. Those with intellectual disability, dementia, and chronic physical disorders would be excluded.

The study procedure will be carried out as depicted in **Figure 1**. Informed consent will be obtained from the study subjects. Family members will be recruited in the study as per the inclusion and exclusion criteria of the study. The research staff would be trained by the Principal investigator (PI)/Co-investigators for identifying high-risk

farmers using PHQ-9. Reliability exercises will be conducted fortnightly with the research staff by the PI. Such screen positive family members of farmers who have committed suicide will be assessed by the consultant for confirmation of psychiatric diagnosis using MINI neuropsychiatric interview. Severity of depression will be assessed by using HAM-D and severity of hopelessness and suicidal thoughts will be assessed using HDSQ. When the research staff visits the family, screening of the family members will be completed, and diagnosis confirmed by consultant. The rating scales will be applied through videoconference.

Family members with mild to moderate depression will be randomized into two groups, one group will receive psychological intervention through videoconference by clinical psychologist and the other group will receive regular treatment. A manual will be prepared regarding the steps and sessions involved in psychotherapy. During the pilot project, it was found that most of the farmers/family members of the farmers use smartphones with the Internet facility. The phone numbers of family will be recorded, and the trained psychologist would video call them and address the concerned psychological issues. The videoconference facility is present at the institute.

Family members diagnosed to be having severe depression or other severe mental illness will be referred to tertiary center for further management. The intervention group will receive five sessions of psychosocial intervention through videoconference spread over three months. The improvement in both groups will be assessed using HAM-D and HDSQ at the end of three months and six months. The assessment will be done by the JRFs who will be blind to the allocation status of the individual, while the psychologist delivers the intervention module. The detailed timeline is given in **Figure 2**.

## Psychological Intervention

The psychological intervention to be delivered will be prepared by qualified clinical psychologist and investigator after discussions and deliberations. A psychological intervention with principles and components of cognitive behavioral therapy (CBT) will be developed. Psychological intervention will

**FIGURE 2.**

## Timeline

| Duration of Study In Months | 0 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 26 | 28 | 30 | 32 | 34 | 36 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I. Study Plan & Preparation | ■ | ■ | ■ | ■ | | | | | | | | | | | | | | |
| Protocol Development | | ■ | ■ | | | | | | | | | | | | | | | |
| Developing Data Collection Instrument | | ■ | ■ | | | | | | | | | | | | | | | |
| Approvals | | | ■ | | | | | | | | | | | | | | | |
| Training | | | | ■ | ■ | ■ | | | | | | | | | | | | |
| Meeting-Progress, Reporting & Review | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | |
| II. Study Implementation | | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | |
| Indentifying famer suicide | | | | | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | | | |
| Psychiatric morbidity in family members | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | |
| Psychological Intervention | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | |
| Follow up | | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | |
| III. Data Analysis Presentation | | | | | | | | | | | | | | ■ | ■ | ■ | | |
| IV. Analysis & Report Writing | | | | | | | | | | | | | | ■ | ■ | ■ | ■ | |
| V. Dissemination | | | | | | | | | | | | | | | | | ■ | ■ |

be given along with the routine treatment. It will be delivered through videoconference. It will be done by trained psychologist with five sessions over period of three months (at 0, 2, 4, 8, and 12 weeks).

One intake session, prior to starting therapy, will be administered where the patient will be psycho-educated adequately.

Sessions will be based on principles of CBT. Common defense mechanisms and cognitive errors would be identified through a process of evaluation. The individuals are taught to discriminate between their own thoughts and reality. They would be discussed with rational explanations, and suggestions offered for corrections of the maladaptive thinking and behavior. Each session will last for 40–45 minutes through videoconference mode. Interaction would be in a direct and non-confrontational way and will respond to the patient. Patient will be provided with suggestions and guidance when necessary. Psychologist can also offer reassurance in minimizing symptoms, improving motivation and adaptation, avoiding deterioration, and understanding, encouraging, and fostering the desire of the patient to achieving objectives that improve his/her well-being. Individuals will also be taught with deep breathing techniques.

Deep breathing would be demonstrated through videoconference and individual would be requested to practice daily for a minimum of 15 minutes.

Baseline evaluation is performed and data is collected by a separate researcher other than the one who is administering the therapy to ensure adequate blinding of the study. The parameters are collected at the end of third and sixth month after induction into the study.

## Sample Size Calculation

The overall suicide rate for farmers across India was 15.8/100,000 people.[4] Sample size with α as 0.05, $\beta$ as 0.80, effect size of 0.53, and with 20% dropout was calculated to be 29 in each group and has been rounded of to 30 in each group. The study participants will be divided based on randomization technique. The PI will prepare the sealed covers, each containing 60 computer-generated random numbers for randomization into either case or control groups. Once a case is identified, a sealed cover will be opened by the Co-PI and assign the case to respective groups.

## Data Management

A secure and robust online portal developed by the Data Management Unit, at the Indian Council of Medical Research will be utilized. Real-time data entry will be done. Data will be stored at Data Management Unit at ICMR.

## Statistical Analysis

The clinical outcomes will be analyzed using the intent to treat (ITT) method. The full analysis set for the ITT method will include all randomized participants, regardless of their subsequent withdrawal or dropout after enrolment.

Continuous variables will be expressed as means/medians ± standard deviation and categorical variables as percentages. The Kolmogorov–Smirnov test will be used to test normality for continuous variables and baseline characteristics will be compared by either student's $t$ test or Mann–Whitney $U$ test for continuous variables. Percentages and proportions will be used to express categorical variables. Bivariate analysis will be conducted by applying Chi-square test (Fisher's exact test when the expected value is <5) for categorical variables. A P value of <0.05 will be considered as the criterion for statistical significance. Repeated measures ANOVA used to detect any overall difference between related means of the two groups. Multiple logistic regression analysis will be done on the outcome variables found to be statistically significant in the bivariate analysis.

## Ethical Issues

Informed consent would be obtained. The study is cleared from the Institutional Ethics Committee. Periodical reports are submitted to ethics committee. Subjects will be referred immediately for any other mental disorders needing treatment. Intervention will be terminated if there is any worsening of baseline depressive symptoms. Details related to identification of the individual/patient will not be shared to central data management team.

## Discussion

There is a constant rise in the number of farmer suicides in India over the years. DIMHANS has an initiative "Raita Chethana" to identify and treat the farmers who are clinically depressed, and adequate and necessary treatments and interventions are provided to them.

Family members of such incidents of farmer suicides are at a greater risk for developing psychological maladies and psychiatric disorders. More often than not, they are left out of the safety net and thus, have increased morbidity and mortality.

Counselling using videoconference is an important tool to treat patients with depression and other psychiatric disorders along with regular treatment. Studies have shown comparable efficacy to face-to-face counselling.[22]

The study undertaken aims to bridge the gap of identifying psychiatric morbidity within the family of farmer who has committed suicide and evaluating the efficacy of counselling over videoconference.

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