

Depression, Suicidal Ideation, and Resilience among Rural Farmers in a Drought-Affected Area of Trichy District, Tamil Nadu

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ABSTRACT

Background: Changes in climatic conditions and other factors including trade and commerce have influenced agriculture worldwide. These factors have created a crisis among farmers. **Objectives:** The objective of this study was to find out the prevalence of depression and suicidal ideation, to measure the resilience, and to find out the factors that influence depression and resilience among farmers. **Materials and Methods:** A community-based cross-sectional analytical study was performed among farmers residing in a drought-affected area of Tiruchirappalli district of Tamil Nadu. The sample size was 191 and cluster sampling was used to select the participants. Structured, pretested questionnaires were used to find the prevalence of depression, suicidal ideation, and resilience among farmers. Pearson Correlation, Student's *t*-test, analysis of variance, and Pearson Chi-square test were used to identify the factors influencing depression and resilience. **Results:** A total of 194 farmers participated in the study. The mean age of the farmers was 46.68 ± 12.6 years, majority 64% were males and 89% were literates. Among the participants, 97.4% had some form of depression, and 67% had severe depression. About 60% of the farmers had suicidal ideation. Male farmers, farmers with few years of farming experience, and severe reduction in yield had a higher level of depression. Suicidal ideation was influenced by gender, small-scale farming, fewer years of experience in farming, and the impact of drought on yield. The mean resilience score was 49.4 ± 10 . Gender and years of experience in farming had a significant association with resilience. **Conclusion:** High prevalence of depression and suicidal ideation and low level of resilience has been observed among the farmers. Interventions need to be provided for marginal and small-scale farmers, male farmers in the affected area to reduce the impact of drought in these farmers.

KEYWORDS: Depression, factors, farmers, resilience, suicidal ideation

INTRODUCTION

Almost 68% of the Indian population live in rural areas where agriculture is the prime source of income.^[1] Farming and its related activities provide employment for 60%–70% of the people in rural areas and hence plays an important role in determining the rural economy.^[2,3] Due to the impact of green revolution, India has become self-sufficient in food production; however, malnutrition and rural poverty have not yet been completely eliminated.^[4,5] In the past few decades, changes in the climate including extreme weather conditions, drought, increase in carbon dioxide

levels, reduction in rainfall, and other changes have significantly affected agriculture.^[6] The contribution of agriculture toward Indian economy has declined in the past few decades with reduction in percentage share to Gross Domestic Product (GDP) from 30.2% in 1980 to 11.8% in 2013–2014.^[7] Employment

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through agriculture-related activities has also declined over the years. A large proportion of rural inhabitants has not been benefited from the economic growth of past 20 years in India.^[8] In fact, liberalization has brought about a crisis in the agricultural sector that has pushed small-scale cash crops farmers into debt.^[9] All these factors have a great impact on physical and psychological health of the farmers. Since depression is identified to be the leading cause of disability, it represents a major public health concern worldwide.^[10] Depression and suicide are closely interlinked. Almost 60% of the individuals died due to suicide were found to have depression. Early identification of depression is critical for reducing suicidal deaths.^[11] It was found that suicidal rates in India were high among marginal farmers growing cash crops and farmers with high level of indebtedness.^[9] Southern states have higher rates of suicide than few Northern states in India.^[12] As per the National Crime Records Bureau, the rates of suicide were found to be high among marginal, small-scale, and medium farmers than large-scale farmers in India. Suicide among farmers due to indebtedness and failure of crops was 20% and 17%, respectively.^[13] Resilience is a dynamic process wherein individuals display positive adaptation despite experiences of significant adversity or trauma.^[14,15] In midst of the unfortunate climatic and other circumstances, farmers still fight against the adversity and try to continue their occupation. It is important to know the factors which influence resilience among the farmers. In the year 2016–2017, Tamil Nadu has received the lowest rainfall and was declared as drought affected.^[16] Hence, farmers would have experienced the impact of drought. The present study was planned to assess the occurrence of depression, suicidal ideation, and its related factors among farmers and the factors which influence resilience among farmers residing in Tamil Nadu which is a Southern Indian state affected with drought.

MATERIALS AND METHODS

Study design

This was a community-based cross-sectional analytical study.

Study area

Village Sangenthi, a small farming village in Tiruchirapalli district of Tamil Nadu, was selected for this study. This village is one of the rural field practicing areas of Trichy SRM Medical College Hospital and Research center, Tiruchirappalli.

Sampling technique

Simple one-stage cluster sampling was used. Among the total of 10 villages in the service area, one village was

randomly selected using simple random technique and all the farmers residing in the selected Sangenthi Village were included in the study.

Study duration

The study duration was 2 months (August and September 2017).

Sample size

The sample size was calculated to be 191 by taking the prevalence of depression among rural population as 14.6%,^[17] with absolute error of 5% and confidence interval of 95%, using the OpenEpi (Open Source Epidemiologic Statistics for Public Health) software version 3.01. Individuals, who were cultivating in agricultural land as owner or tenant or sharecropper, were included in the study. Marginal, small-scale, and large-scale farmers are the farmers who cultivate in 2.5 acres, >2.5–5 acres, and >5 acres of land, respectively. Inclusion criteria: farmers who have given consent to participate in the study. The nonresponse rate was 5.8%. Exclusion criteria: farmers with severe hearing disability and intellectual disabilities who were not able to respond to the questionnaire were excluded from the study.

Study tools

The Assessment of Depression and Suicidal Ideation was done by Patient Health Questionnaire-9 (PHQ-9),^[18] an instrument which can be used to screen, diagnose, monitor, and measure the severity of depression. The score ranges from 0 to 3 (not at all = 0, several days = 1, more than half the days = 2, and nearly every day = 3). Question-9 screens the presence and duration of suicide ideation. The questionnaire was translated to Tamil which is the local language and back-translated again to English and Tamil version was used. The questionnaire was self-administered and for 21 farmers those who were illiterates the questions were explained by the principal investigator. The total score is categorized into normal, minimal depression, and major depression with mild, moderate, and severe severity when the score is 0–4, 5–9, 10–14, 15–19, and 20 or higher, respectively. Resilience was assessed by the Connor-Davidson Resilience Scale^[19] which comprises of 25 items each rated on a 5-point scale (0–4), with higher scores reflecting greater resilience. The scale was translated, pretested, and used. Total score ranges from 0 to 100. Factors influencing resilience in individual farmers were assessed using a semi-structured questionnaire which included information about the age, gender, years of experience in farming, land ownership, socioeconomic status of the family, and their perception on the impact of the drought regarding yield and financial implications. The study was carried out after the approval by the

Institutional Ethics Committee. The benefits of this study were explained to the participants and informed written consent was obtained before carrying out the study. Complete privacy was provided to the participants. All the farmers who had depression were given counseling in their house and farmers with severe depression were further referred to the tertiary care teaching hospital for further evaluation and treatment. With permission of the study participant, family members were also included in the counseling and discussion for some of the participants.

Data analysis

After data collection, all data were entered in Microsoft Excel and analyzed using Statistical Package for Social Sciences (IBM SPSS statistics version 21.0). Sociodemographic details, prevalence of depression, and suicidal ideation are reported in proportions. Depression and resilience score is presented as mean with standard deviation. Pearson correlation was used to assess the relationship between age, farming experience, and scores. Student's *t*-test was used to analyze the gender difference of the scores. Analysis of variance (ANOVA) was used to assess the association between farming experience, socioeconomic status, and the scores, and Pearson Chi-square test was applied to identify the relationship between independent factors and suicide ideation among farmers.

RESULTS

A total of 194 farmers have participated in the study. Table 1 describes the sociodemographic details of the study participants. The mean age of the farmers was 46.68 ± 12.6 years ranging between 23 and 80 years. Majority of the participants were in the age group of 30–59 years. Among the participants, 64% were male and 36% were female. Majority of the farmers have completed high school education and almost 11% were illiterates. Socioeconomic status was classified using BG Prasad scale updated for the year 2017.^[20] Majority of the farmers belonged to lower middle class. Overall mean per capita income of the study group was 1919.5 ± 196.9 rupees. One hundred and sixty-four farmers (84.5%) were living in nuclear type of family. 115 (59.3%) farmers were involving in agricultural farming activities for more than 20 years and the mean years of experience were 21.8 ± 13.8 years. Marginal, small-, and large-scale cultivation was done by 71.6%, 25.3%, and 3.1% of the farmers, respectively. 138 (71.1%) farmers felt that their family financial status has become very worst due to the drought. One-fourth of the study participants reported that the agricultural yield was completely eliminated by the drought, and 160 farmers had a fear that their family would not be able to recover from the problems

Table 1: Sociodemographic details of the study participants

	Frequency (%)
Age category (years)	
20-29	16 (8.2)
30-39	45 (23.2)
40-49	49 (25.3)
50-59	47 (24.2)
60-69	24 (12.4)
≥70	13 (6.7)
Gender	
Males	124 (63.9)
Females	70 (36.1)
Education status	
Illiterate	21 (10.8)
Primary	39 (20.1)
High school	100 (51.6)
Higher secondary	19 (9.8)
Graduate	15 (7.7)
Socioeconomic status (Rs.)	
Upper (≥6254)	9 (4.7)
Upper middle (3127-6253)	14 (7.2)
Middle (1876-3126)	44 (22.7)
Lower middle (938-1875)	80 (41.2)
Lower (<938)	47 (24.2)
Total	194 (100)

faced due to the loss of farm production if the drought continues for another 1 year.

Depression and its related factors

The mean depression score was 12.28 ± 5 and the score ranged from 3 to 24. Among the participants, 97.4% had some form of depression [Figure 1]. Age of the individual had negative correlation with the occurrence of depression. Depression score decreased with increase in age with $r = -0.105$. This relation specifies that young age farmers have more depression than old-age farmers. However, the relation was not statistically significant with $P = 0.14$. The depression score was high among males compared to females. The difference was statistically significant with $P = 0.004$. Marginal and small-scale farmers had a higher level of depression score compared to large-scale farmers. With ANOVA test, it was observed that when the years of involvement in farming was more, the depression score was less. Although overall depression score was high in the low socioeconomic group, socioeconomic status of the family did not have a statistically significant impact on the occurrence of depression among farmers. Degree of depression increased with reduction in socioeconomic gradient; however, the difference was less which could not give a statistically significant result. Severity of the drought on the yield

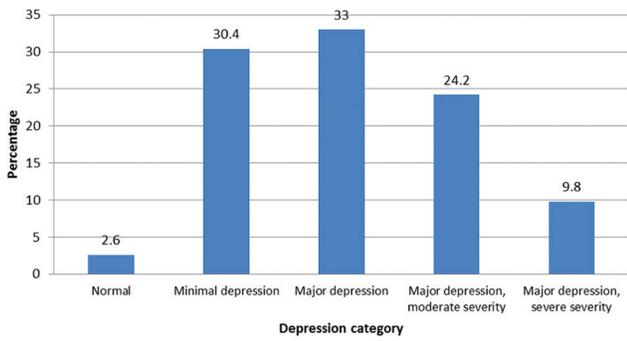


Figure 1: Categorization of depression among farmers based on Patient Health Questionnaire scale

of agricultural products had a significant impact on the presence of depression. Among the farmers who perceived that the yield was completely eliminated compared to the previous years, the mean depression score was significantly high [Table 2].

Suicidal ideation

Of the total of 194 farmers, 117 (60.3%) had suicidal ideation. Among them, 19.1% had suicidal ideation for several days in the previous 2 weeks, 21.1% had suicidal ideation for more than half the days, and 20.1% had suicidal ideation almost every day. Suicidal ideation was high among males compared to females. The difference was statistically significant ($P = 0.002$). Proportion of individuals having suicidal ideation was more in young age farmers who were aged below 30 years compared to the presence of suicidal ideation among farmers aged more than 60 years. Suicidal ideation was high among marginal and small-scale farmers with 61.7% of them having suicidal ideation and among large-scale farmers suicidal ideation was present among 16.7% of the farmers. Years of experience in farming practices had significant negative impact on suicidal ideation with lower percentage of suicidal ideation among farmers with more years of experience. Impact of drought on the yield of agricultural production has significantly influenced the presence of suicidal ideation among the farmers [Table 3].

Resilience and its related factors

The mean resilience score was 49.4 ± 10 . Minimum score and maximum score obtained was 21 and 69, respectively. Whereas, minimum attainable score was 0 and maximum attainable score was 100. Resilience score increased with increase in age. However, it was not statistically significant with $r = 0.57$ and $P = 0.4$. Among the farmers participated, males had significantly high level of resilience compared to females. Large-scale farmers had high resilience score compared to marginal and small-scale farmers. Economic status of the family did not have a significant impact on the presence of

Table 2: Factors associated with depression among the participants

Variables	Mean score±SD	t/F	P
Gender**			
Males	13±5.1	2.95	0.004*
Females	10.8±4.5		
Type of farming**			
Small and marginal farmers	12.4±5	1.7	0.07
Large-scale farmers	8.6±5.2		
Farming experience (years) [‡]			
<10	13.9±4.7	5.97	0.001*
10.1-19.9	12.3±5.1		
20-29.9	12.7±4.9		
≥30	10.09±4.7		
Socioeconomic status [‡]			
Upper/upper middle	11.9±4.2	0.09	0.9
Middle	12.1±4.6		
Lower middle/lower	12.3±5.3		
Impact of drought on the yield**			
Completely eliminated	14.1±5.7	2.93	0.004*
No significant reduction	11.6±4.6		

*P value significant, **Student’s t-test, [‡]ANOVA, *post hoc* test was significant between experience <10 and >30 years and experience between 20-29.9 and >30 years. SD: Standard deviation, ANOVA: Analysis of variance

Table 3: Factors related to suicidal ideation among the participants

Variables	Yes, n (%)	No, n (%)	P
Age (years)			
20-39	43 (70.5)	18 (29.5)	0.14
40-59	54 (56.2)	42 (43.8)	
≥60	20 (54.1)	17 (45.9)	
Gender			
Males	85 (68.5)	39 (31.5)	0.002*
Females	32 (45.7)	38 (54.3)	
Type of farming			
Small and marginal farmers	116 (61.7)	72 (38.3)	0.026*
Large-scale farmers	1 (16.7)	5 (83.3)	
Farming experience (years)			
<10	40 (72.7)	15 (27.3)	0.015*
10.1-19.9	14 (58.3)	10 (41.7)	
20-29.9	39 (65)	21 (35)	
≥30	24 (43.6)	31 (56.4)	
Socioeconomic status			
Upper/upper middle	13 (56.5)	10 (43.4)	0.21
Middle	22 (50)	22 (50)	
Lower middle/lower	82 (64.5)	45 (35.4)	
Impact of drought on the yield			
Completely eliminated	36 (76.6)	11 (23.4)	0.009*
No significant reduction	81 (55.1)	66 (44.9)	

*P value significant

resilience with $r = 0.03$ and $P = 0.9$. Years of experience in agriculture-related activities had significant positive

Table 4: Factors affecting resilience among the participants

Variables	Mean score±SD	t/F	P
Gender**			
Males	50.7±9.6	2.4	0.016*
Females	47.1±10.4		
Type of farming**			
Small and marginal farmers	44.1±13.4	1.3	0.19
Large-scale farmers	49.6±9.9		
Farming experience (years) [‡]			
<10	50.64±9.8	2.76	0.04*
10.1-19.9	50.54±9.4		
20-29.9	50.92±10.6		
≥30	46.2±10.2		
Impact of drought on the yield**			
Completely eliminated	49.09±10.1	0.28	0.77
No significant reduction	49.5±10.07		

*P value significant, **Student's *t*-test, [‡]ANOVA. SD: Standard deviation, ANOVA: Analysis of variance

relationship with the presence of resilience among the farmers with $P = 0.04$. The effect of drought on the yield did not have a significant impact on resilience [Table 4].

DISCUSSION

The present study included 194 farmers to assess the presence of depression, suicidal ideation, and resilience and the factors that influenced the presence of depression and resilience. The study has included participants across various age groups, socioeconomic groups, and different years of experiences in farming activities. Almost 90% of the study participants were literates and majority were involved in farming activities mainly because it was their ancestral occupation. In this study, no significant association was observed between age and presence of depression. Demos *et al.* and Gunn *et al.* have observed lower level of depression among old-age farmers than young farmers.^[21,22] In the present study, males had higher level of depression than females. In their study on anxiety and depression among farmers and other occupational workers, Torske *et al.* also observed higher level of mean depression score and depression symptoms among males compared to females.^[23] Sanne *et al.* also found that males have high level of depression than females.^[24] In contrast to this, Hanklang *et al.* have observed high level of depression among female farmers.^[25] In this study, nearly 90% of the farmers were financially poor belonging to middle, lower middle, and lower socioeconomic classes. Since the farmers belonging to upper socioeconomic class was less, the statistically significant difference between the socioeconomic groups could not be observed. Conversely, Kumar and Behmani observed low mean

depression score among female farmers below poverty than farmers above the poverty line.^[26] Poverty and indebtedness were identified to be one of the reasons for farmers' suicide in various parts of India.^[27,28] The prevalence of depression in India among the general population based on the National Mental Health Survey was 5.25%.^[29] In the present study, 97.4% of the farmers participated in the study had some form of depression whether it is mild, moderate, or severe based on the PHQ-9 scores. Suicidal ideation was present among 60.3% of the participants. This has high social significance because suicide has a significant impact on the economic status of family and social and psychological status of the family members.^[30] Suicidal ideation was high among males compared to females. Higher proportion of male farmers had depression and suicidal ideation. This would have occurred because males are head of the family in most of the families and they had to manage the stressors related to difficult farming circumstances and other social and financial problems of the family. Suicidal ideation was high among small-scale and marginal farmers than large-scale farmers. This could be because marginal and small-scale farmers may not be able to bear the serious consequences of reduced farming output which has detrimental effects on the financial status of their family. This result is also reflected in the farmers' perception about the impact of drought if it extends for another year. Except for 1.5% of the farmers, all others felt that drought will have a significant negative impact on them and they will not be able to recover from the negative consequences. Male farmers had higher resilience score than females, yet they were not able to overcome depression which was reflected in their depression score which was high compared to females. Although farmers with less years of farming experience had higher resilience score than experienced farmers, the level of resilience was not sufficient enough to enable them to cope with the impact of the present experience of drought. Small and marginal farmers had low resilience score and higher level of depression and suicide ideation which would have occurred due to the severe impact of drought on the agricultural production and its economic impact.

CONCLUSION

The prevalence of depression and suicidal ideation among farmers in the study area was high. Though some farmers were able to cope with the problem, majority of the farmers were not able to cope with their high level of farming related problems and depression.

Recommendations

1. Since the socioeconomic status among the farmers was very low, improving the access and utilization of financial and other support measures available for the farmers would be of great help in reducing the occurrence of depression
2. Counseling for the farmers is the need of the hour because 60% of the farmers participated in the study had suicidal ideation to improve their mental health status and get relieved from the distress. Still, it would only be an immediate and interim measure for suicide prevention. Training the farmers about the methods of farming in difficult climatic circumstances will be the long-term action to reduce the problems among farmers.

Limitations

1. Depression and resilience measured in this study are self-reported by the farmers which have not been confirmed by clinical assessment by physician. This could have been one of the reasons for high level of depression reported in this study
2. Higher proportion of the study participants was marginal and small-scale farmers which had a significant influence on the presence of high prevalence of depression in the study group. Available literature have provided evidence of high level of depression and suicide ideation among marginal and small-scale farmers
3. Majority of the farmers belonged to middle and lower socioeconomic status. Impact of the present drought on the already existing financial issues may be one of the reasons which influenced the high prevalence of depression.

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Conflicts of interest

There are no conflicts of interest.

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