

Original Research Article

Assessment of mental health status among kalitheerthalkuppam farmers Puducherry: a cross-sectional study

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ABSTRACT

Background: Every year, more than 450 million people develop a mental disorder globally. About 75% of people affected by mental disorders live in low-income and middle-income countries (LMICS), and most have no access to appropriate treatment. This study intends to examine how occupational characteristics like time of work, working hours per day impact the mental health of farmers. The aim is to gather data that illuminates the relationship between mental health and occupational characteristic of farmers.

Methods: It is a quantitative, cross-sectional study conducted among 152 farmers in a selected village at Puducherry. The validated self-structured questionnaires consisting of sociodemographic profile, anthropometric measurement, occupational characteristics assessing questionnaire and Depression Anxiety and Stress scale-21[DASS-21] were used to collect data. Simple random sampling technique was used for selection of participants. Statistical analysis, IBM SPSS statistics version 25 has been used.

Results: In this study we found that, majority were normal weight (n=112, f=73.7%). Mean score of depression M=10, SD=6.12, for anxiety M=10.3, SD=6.32 and stress M=11.40, SD=5.44. Most of the farmers reported heavy workload (n=137, f= 90.1%) and among them (n=85, f =55.92) farmers reported working more than 6 hours a day. There is a significant association between Occupational characteristics and mental health of farmers.

Conclusions: Farmers have higher mental health issues. Heavy workload and more working hours per day are independently associated with more mental health problems. Our findings highlight the importance of including mental health within occupational programmes.

Keywords: Depression, Anxiety, Stress, Occupational characteristics, Farmers

INTRODUCTION

A significant portion of the worldwide disease burden is caused by anxiety and depression disorders. Anxiety and depression disorders contribute significantly to the global medical burden. In middle-class and prosperous regions like the United States, Europe, Japan, and Australia, depression is the major cause of disability related to

health. According to predictions, depression would rank second globally in terms of the burden of disease by 2020. Mental health is a major health concern in agriculture. The main source of income is farming; therefore, long work hours and demanding, unpleasant duties are part of the job. Due to the effects of the environment and the availability of services, responsibilities also greatly differ depending on the kind

of crops and the geography. Among the major occupational groups that reside and work almost exclusively in rural areas, farmers and agricultural laborers are unusual. Therefore, it's critical to comprehend rural communities' characteristics in relation to health and medical services.¹

Significant obstacles from climate change and environmental disasters like droughts, fires, and floods also affect the farming community. Furthermore, it has been shown that the demands of family members' jobs such as personal finances, time restrictions, poor working settings, and hazardous working conditions have a significant impact on their stress levels. Agricultural workers are burdened by chronic illnesses, lower socioeconomic status, and other employment-related concerns; some of these can lead to stress-related health disorders like depression and suicide.¹

Based on data from the NCRB, 31,666 individuals in India took their own lives in 2014. Of those, 12,360 were farmers. When the suicide rate rises within a specific group in society, it frequently indicates that the group is under selective pressure from other aspects of the broader environment. These may vary like economic (e.g., debt and persistent crop failure) to demographic (e.g., family structure) to psychological (e.g., mental illness). Studies conducted in India and neighboring countries highlight the alarming prevalence of depressive disorders among adolescents. For instance, in India, a staggering 40% of adolescents experience depressive disorders, while in Bangladesh, over 80% of college-going adolescents face moderate to severe levels of depression.^{2,3}

Services and concerns related to mental health are often overlooked in rural locations, especially in farming communities. Approximately one-sixth of all problems related to health are mental illnesses.⁴ The contributing elements to mental health issues among Indian farmers include changing lifestyles, frequent income interruptions, crop failure, natural disasters (drought and flood), economic crises, unemployment, a lack of social support, and growing insecurity.⁵ Another example of how financial uncertainty affects mental health is the spate of farmer suicides that have occurred in several parts of India during the mid-1990s.⁶ Farmers whose products are no longer priced competitively, adding to a host of additional issues like poor-quality seeds and a lack of assistance from banks. The problem of mental disorders due to agricultural work conditions have been barely studied in LMICs and especially in a Latin American context.⁷

The state of mental health in India is hard to measure, and there aren't many researches that have been published that specifically address this topic. This study sought to determine the farmers' levels of stress, anxiety, and depression in Kalitheerthalkuppam Village, Puducherry, India. Public health experts can better address potential mental health difficulties in this working population by using the study's findings. Based on earlier research, rural

farmers should have a higher prevalence of mental health issues.⁸

In this study farmers are operationally defined as farmers who are involved in agriculture practice on their own land.

Objective

To assess the occupational characteristics of kalitheerthalkuppam village farmers Puducherry. To know the mental health status of farmers in kalitheerthalkuppam village Puducherry. To find the association between occupational characteristics and mental health status of farmers in kalitheerthalkuppam village Puducherry.

METHODS

Among villages in Puducherry, major farming activities were done in villages like Bahour and Kalitheerthalkuppam, was selected randomly we came up with the Kalitheerthalkuppam village. This study was a cross-sectional study performed on farmers of Kalitheerthalkuppam village Puducherry. A total of 152 farmers were selected with a simple random sampling method with an age range of 20-60 (Mean age of 38.9 ± 8.06). The participants gave written consent to participate in the study. Data collections were carried out in a single village.

Measures

Demographic data which included age, working hours per day, level of education, marital status, time of work, substance abuse. These data were obtained from the participants. Body measurements included weight and height to calculate BMI of the participants. BMI was calculated as weight in kg/ height in square (m) based on that participants were categorized into underweight, normal, over weight and obese based on Who classification of BMI.⁹ Depression Anxiety and Stress over the past week has been assessed using self-reported Depression Anxiety Stress scale 21 (DASS-21).¹⁰ The DASS-21 used has been already translated to local language by Sub raj Alagarsamy.¹¹ This scale has been widely used on workers and employees. Three sub-scales consisting of 7 items each were calculated: stress, anxiety and depression, with scores for each sub-scale ranging from a possible 0 to 42. DASS questionnaire was filled for each participant during an interview session. A locally validated questionnaires consisting of occupational characteristics about type of farmers, pesticide exposure, challenges related to climate changes, heavy workload and substance abuse was used.

Procedure

The farmers' demographic information was gathered initially. After that Anthropometric measurement of the farmers was taken as Farmers were asked to stand straight

with their back against the wall or measuring board. Their feet should be together, and their heels, buttocks, shoulders, and head should be touching the wall. Align the Head and we ensured that the participant's head is in the Frankfort horizontal plane. This means the line from the bottom of the eye socket to the top of the ear should be horizontal. We used a ruler, to gently press down on the top of the participant's head to create a clear mark on the wall. By using a measuring tape we measured from the floor to the mark we made on the wall and recorded the height in centimeters. We make sure that scale is properly calibrated before use. We ask the participant to remove any heavy clothing, shoes, or accessories that could affect the weight. The participant stand in the center of the scale with their feet flat and evenly spaced. They should stand still and avoid leaning or holding onto anything we waited for the scale to stabilize and display a consistent reading and note the weight displayed on the scale in kilograms. Additionally, the farmers' levels of

stress, anxiety, and depression were measured using the DASS-21. Farmers' occupational assessment questions were evaluated in addition to that.

RESULTS

Mean age of the participants was 38.9 ± 8.06 years. Among the study population majority of them were in the age category of 31-40 years. The age group with the highest representation is 31-40 years, making up (38.1%) of the total study population. 41-50 years group also represents a significant portion (33.5%). 51-60 years group has a smaller percentage at (18.4%). Where 20-30 years group has the smallest representation at (9.8%).

Mean BMI of the subjects was 23.67 ± 2.28 kg/m² with majority of participants 112 (73.6%) having normal weight (Figure 1).

Table 1: Sociodemographic characteristics.

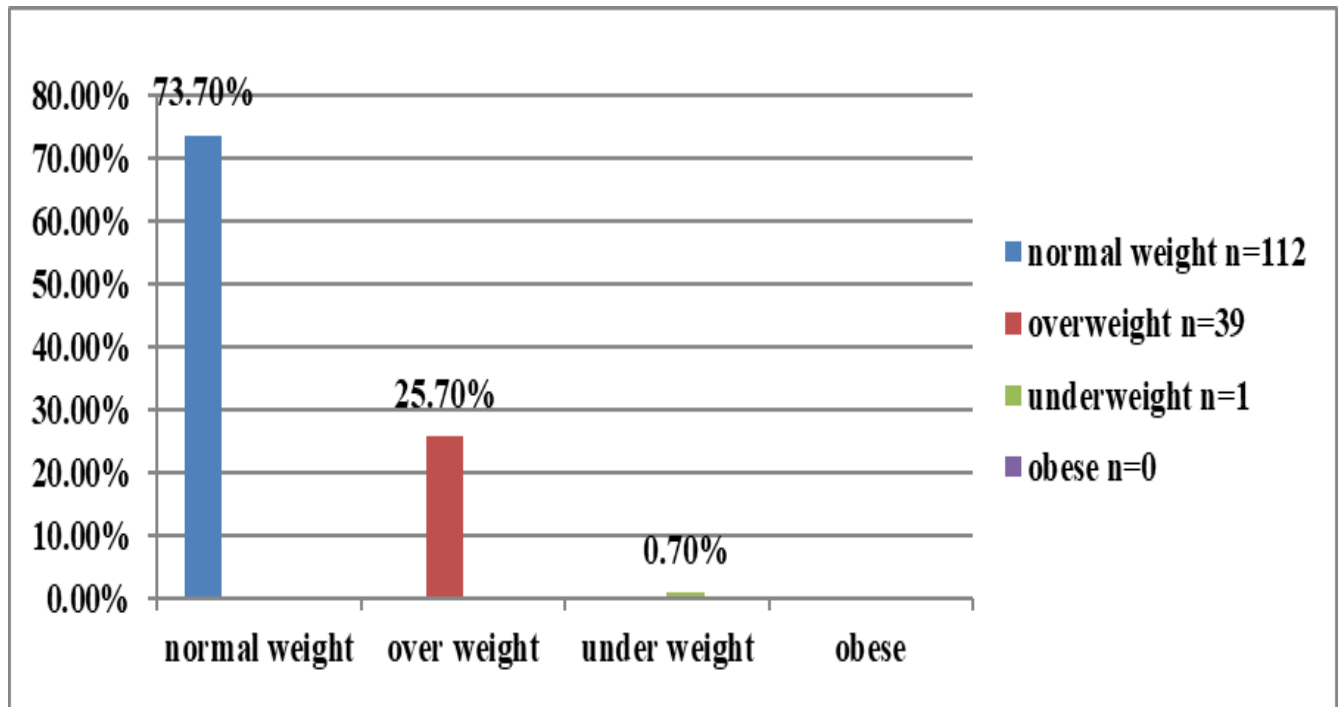
Sociodemographic characteristics	Frequency	Percentage
Gender		
Male	121	79.6
Female	31	20.3
Age (in years)		
20-30	15	9.8
31-40	58	38.1
41-50	51	33.5
51-60	20	18.4
Level of education		
Less than senior high school	55	36.1
Senior high school	59	38.8
Degree or higher	38	25
Marital status		
Unmarried	15	9.86
Married	137	90.1
Exposure to pesticide		
Yes	144	94.1
No	8	5.2
Heavy workload		
Yes	137	90.1
No	15	9.86
Substance abuse		
Non-smokers and non-alcoholic	128	84.2
Smoker and alcoholic	12	14.5
Type of farmer		
Marginal farmers	31	20.3
Small farmer	67	44
Semi-medium	48	31.5
Large farmer	6	3.9

*marginal farmer below 1 acre of land, small farmer 1-2 acre of land, semi- medium 2-4 acre of land and large farmer greater than 5 acre of land.

Table 2: Frequency distribution of DASS-21 scores.

	Mean $\pm$ SD	Normal Frequency (%)	Mild Frequency (%)	Moderate Frequency (%)	Severe Frequency (%)	Extremely severe Frequency (%)
Stress	5.94 $\pm$ 3.15	109 (71.7%)	27 (17.8)	15 (9.9%)	1 (0.7%)	0
Depression	5.21 $\pm$ 3.3	79 (52.0%)	25 (16.44%)	41 (27.0%)	7 (4.6%)	0
Anxiety	5.2 $\pm$ 3.29	50 (32.9%)	26 (17.1%)	36 (23.7%)	20 (13.2%)	20 (13.2%)

a: Stress is classified as Normal (0-14), Mild (15-18), Moderate (19-25), Severe (26-33) and extremely severe (34 and above) (Lovibond & Lovibond, 1995). b: Depression is classified as Normal (0-9), Mild (10-13), Moderate (14-20), Severe (21-27) and extremely severe (28 and above) (Lovi bond & Lovibond, 1995). c: Anxiety is classified as Normal (0-7), Mild (8 - 9), Moderate (10 - 14), Severe (15 - 19) and extremely severe (20 and above) (Lovibond & Lovibond, 1995).

**Figure 1: BMI categories among study participants.****Table 3: Association between working hours per day and stress, anxiety and depression.**

Variable	Chi square value	P value	Significant/not significant
Working hours per day* stress	16.694	.010	Significant
Working hours per day* depression	19.29	.004	Significant
Working hours per day* anxiety	21.329	.006	Significant

Chi-square values and p-values represent the relationship between working hours per day and the psychological factors (stress and depression). A p-value less than 0.05 indicates a statistically significant relationship. Stress: Chi-square=16.694, $p=0.010$, indicating a significant association between working hours and stress levels. Depression (First instance): Chi-square=19.29, $p=0.004$, indicating a significant association between working hours and depression. Depression (Second instance): Chi-square=21.329, $p=0.006$, indicating a significant association between working hours and depression.

Table 4: Association between time of work and stress, anxiety and depression.

Variable	Chi square value	P value	Significant/not significant
Time of work* stress	42.000	.000	Significant
Time of work* depression	46.112	.000	Significant
Time of work* anxiety	53.357	.000	Significant

The Chi-square tests assess the relationship between time of work and psychological factors. All results are statistically significant ($p<0.05$), indicating strong associations between time of work and stress (Chi-square = 42.000, $p=0.000$), depression (Chi-square=46.112, $p=0.000$), and anxiety (Chi-square=53.357, $p=0.000$).

Table 5: Correlation between working hours per day and DASS-21 scale.

Scores		Stress	Anxiety	Depression
Working hours per day	Pearson correlation	0.264	0.258	0.294
	Sig. (2-tailed)	.001	.001	<.000
	N	152	152	152

Education levels of 152 participants: 36.1% have less than senior high school education, 38.8% have completed senior high school, and 25.0% hold a degree or higher. This distribution shows the majority has either completed high school or has less formal education. Marital status of farmers about 90% of farmers were married and only (n=15, 9.86%) of participant were unmarried. Most of the farmers are quite common with their pesticide use in their land, while some reported not using (n=85.26%). The data reveals that most respondents (90.1%) reported experiencing a heavy workload, while a smaller portion (9.9%) indicated they did not. This suggests that most participants feel overburdened by their tasks, highlighting potential issues with workload management in their environment. The data categorizes farmers based on land size. Most respondents are small farmers (44%), followed by semi-medium farmers (31.5%). Those with less than 1 acre represent 20.3%, while only 3.9% are large farmers with over 5 acres. This indicates a predominance of smaller-scale farming operations in the sample. Most of the participants were non-smokers and occasional alcoholic (n+=128, 84.2%) while others reported smokers and alcoholic (n=22 ,14.5%).

This study results showed that significant majority of farmers (71.7%) report normal levels of stress. However, a notable percentage (17.8%) experience mild stress, and 9.9% report moderate stress. Only 0.7% report severe stress, with no respondents indicating extremely severe stress. The prevalence of depression among farmers reveals a more concerning picture. While 52.0% of farmers report normal depression levels, a substantial proportion experience mild (16.4%) and moderate (27.0%) depression. The percentage of severe depression is relatively low (4.6%), with no cases of extremely severe depression reported. The anxiety levels among farmers show a complex distribution. Only 32.9% of farmers report normal anxiety levels, while 17.1% experience mild anxiety. A significant percentage reports moderate anxiety (23.7%), and 13.2% each report severe and extremely severe anxiety. The high percentages of severe and extremely severe anxiety are particularly noteworthy, indicating that a considerable proportion of farmers face substantial anxiety challenges.

Table 3 shows the association between working hours and DASS-21. Table shows a positive relationship between working hours per day and mental health outcomes (stress, anxiety and depression). They are statistically significant, suggesting that longer working hours may be associated with higher levels of these mental health

issues. Among the other two mental health outcomes it shows a strong correlation with depression.

All three relationships between "Time of Work" and stress, depression, and anxiety are statistically significant (p-values = 0.000 for all), meaning there is a strong association between the amount of time spent working and these mental health issues.

The Chi-Square values are also relatively large (42.000, 46.112, and 53.357), which further suggests that these associations are meaningful and not due to random chance.

Therefore, based on this data, Time of Work appears to have a significant impact on levels of Stress, Depression, and Anxiety.

Table 5 shows a positive-correlations with stress (0.264), depression (0.294), and anxiety (0.258), all significant at the 0.01 level. This implies that longer working hours are associated with higher stress, depression, and anxiety levels.

DISCUSSION

This study attempted to find out the prevalence of depression, anxiety, and stress among farmers of kalitheerthalkuppam village. It assessed mental disorder symptoms and potential risk factors on farmers and reveals mental health status based on stress, depression, and anxiety among 152 respondents. The prevalence of depression, stress and anxiety found to be 26.9%,15% and 23.6%. The findings indicate that while stress being normal among farmers when we compare with normal rural and urban people, but Depression and Anxiety were quite higher among farmers. Research by Ajay Mallya et al supports the above findings that prevalence of Depression, anxiety and stress were found to be 23.1%, 29.4% and 26.6% in urban areas and 19.1%, 24% and 21.1% in rural areas respectively. The levels of Depression and Anxiety among farming people were quite higher when we compare with the above finding.¹²

A study by Bomble P, Lhungdim H et al supports the findings, that stress being lower when compared with anxiety and Depression. About 13.2% of respondent reported with severe and extremely severe levels of anxiety.¹³

Furthermore, when DASS-21 and working hours per day are compared, the study found a positive correlation of

0.264 for stress, 0.258 for anxiety, and 0.294 for depression. This suggests that working more hours per day is positively connected with DASS-21.

Previous research by Bazo-Alvarez JC et al shows that the findings are profound, as the farmers had more mental disorders symptoms, having a heavy workload and working more hours per day was associated with a higher risk of having mental disorder symptoms. The study found that time of work is associated with an increased level of stress, depression and anxiety and that may due to the lack of fixed time regulation.¹⁴

Limitations

The main limitation of this study, it only targeted a single village in Puducherry. In this study we are unable to measure the temperature of the working area and humidity level when these two things play a major role in determining the mental health of farmers. Our study failed to relate the pesticide exposure with DASS-21 scale and time of work.

CONCLUSION

In conclusion, farmers in this study had a normal BMI of about 112 contributing to about 73.7 %, and reported mental exhaustion more than physical exhaustion after work. Their depression and stress levels are same as compared with rural Indians. But the levels of Anxiety were quite higher than the normal rural and urban Indians. That indicates the risk of further mental health problems. The prevalence of mild to moderate mental health issues highlights the need for targeted interventions to support the mental well-being of farmers. By addressing the contributing factors and implementing strategies to improve mental health support, it is possible to enhance the overall well-being of farmers and ensure the sustainability of the agricultural sector. Addressing these mental health challenges is not only beneficial for individual farmers but also vital for the health and productivity of the broader farming community.

Recommendations

The study suggests a robust link between increased working hours and higher levels of stress, depression, and anxiety. This correlation underscores the need for interventions aimed at mitigating the psychological impacts of extended working hours.

The interventions should target on: Regular Mental Health Check-ins. Mental health awareness programs. Stress Management Programs. Flexible Working Hours.

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