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A CASE - CONTROLLED STUDY OF SUICIDES IN AN AGRARIAN DISTRICT IN KERALA

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ABSTRACT

Background: Agriculturist has high rate of mortality in any industry. In India farmers' suicide has been a burning issue for more than two decades now. The aim of the study was to see what leads to suicide among farmers of the state of Kerala. **Material and Method:** The authors performed a case control psychological autopsy analysis of 166 successive suicides in Wayanad an Agrarian district in Kerala examining the major psycho-socio-demographic profile , details regarding the suicide, retrospective psychiatric diagnosis, profile life events using the relevant tools controlling the age, sex, marital status and monthly income. **Results**: The victims were more likely to be staying in rented houses, no own land or cultivation, migrated, with marital issues, staying separately, and had unsatisfactory relationship with family members. Farmers had debt from private money lenders and individuals, had past suicidal attempts and family history of alcohol dependence. They had significantly higher score for total life events. 33% of the victims were alcohol dependent while depression occurred in 28% of the victims. Majority of the farmers committed suicide by hanging followed by organophosphorous poisoning. 38.5% had expressed suicidal intent prior to attempt, 30.2% had consumed alcohol at the time of attempt. 75.7% had chosen their house or premises for attempt. The findings of this study are discussed with special relevance to Indian context.

Key Words: *Farmers, suicide, psychological autopsy, attempt*

INTRODUCTION

Despite the popular image of farming as a peaceful and healthy way of life, agriculture has the highest rates of mortality in any industry (Mcurdy & Carrol, 2000). In India farmer's suicide has been reported from various states like Punjab, Maharashtra, Andhra Pradesh, Kerala and various other states where there are varied cultural practices and farming patterns (Mishra, 2006). Physical stressors, hazards of farm environment, declining trends of trade of agricultural produce, volatile commodity markets, limited availability of farm employment, growing cost of machinery and production, loss of farm livelihood due to crop failure, ever increasing rate of alcohol dependence, depression and the influence of migration are the reasons for this alarming rate (Fraser et al, 2005).

For the last ten years Wayanad, a tiny hill district in Kerala famous for its spices and coffee plantations has reported a higher suicide rate above 30 per 100,000 by distressed farmers-a phenomenon that is becoming increasingly commonplace in rural India as a result of implementation of free market economic policies (SCRB, 2009). The drastic fall in the price of agricultural products, ever increasing rate of alcoholism, depression and the influence of migration are speculated as the reasons for high rate of suicides among the farmers who dominate this district. Hence it is necessary to study the psychosocial factors of suicide which operate in this place for formulation of suitable remediable measures. Considering the paucity of such studies especially among farmers the present study was undertaken to identify and to understand the role of psychosocial factors like psychopathology, life events, and socio-economic factors leading to suicide in this agrarian district.

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MATERIAL AND METHOD

Salient features of Wayanad District

The total geographical area of Wayanad is 2131 sq.km, and its population is 7,86,627. The male and female population is 3,93,397 and 3,93,230 respectively. The female-male sex ratio is 1:1. The density of population is 369 per sq.km (Kerala Census, 2001). The literacy rate is 85.52 per cent. Wayanad is the most backward district in Kerala. It is only 3.79% urbanized. Ninety per cent of its population depends upon agriculture for sustenance. There are 40,129 farmers, 74,813 agricultural labourers, and 17,413 plantation labourers in this district. Another 37,267 people earn their livelihood from animal husbandry and forest produce (District Project-Wayanad, 2001). The district has highest tribal population, about 1.25 lakh, constituting 17 per cent of the total population. The major crops grown here are coffee, pepper, tea, cardamom, areca-nut etc. Besides cash crops, the most important crop in the district is rice.

Wayanad has a large settler population. There were large scale migrations from southern Kerala in the early 1940s. Wayanad has a small Jain community consisting of Gowders who came from Karnataka in the 13th century. The Nairs from Kottayam dynasty made an entry in the 14th century. They were followed by Muslims constituting one fourth of population. Almost all sections of Christianity are well represented constituting another one fourth of population. Hindus contribute to the rest of the population. A notable feature of life in Wayanad is that it is touched to its very roots by the operation of the nationalized, commercial and cooperative banks. The branches of these banks located in the remote areas of the district have a busy time during the marketing time of cash crops.

Study Sample

Cases

All completed suicides from 1st January to 31st June in (2004) reported by Wayanad District Crime Record Bureau were analyzed in detail using a specially designed questionnaire. Two experienced psychiatrists (S.K. and A.K.) interviewed the relatives of victims and controls by visiting them at their residence. The interviews were carried continuously without any selection bias. However interview could be done only if the deceased person had a family member or a relative who provided suitable data. Out of 180 suicides reported, 14 cases could not be traced due to faulty address. Cases were traced through the police stations. Homes of the suicide victims were directly visited 30 days after the suicide but within 90 days. After establishing rapport, general explanation was given revealing the specific objectives of the study and informed consent was obtained.

Controls

Controls were those living in the same neighborhood, same sex, marital status and within the same monthly income range (Less than ₹ 2000, 2001-5000 and above 5001 per month). The age of the control was matched to that of the victim within the range of ±2 years. Controls were registered within three months for the corresponding cases.

Informants

The information about the victim and control was obtained from key informant. The key informant was a close relative who had been living with the deceased or control for minimum two years. The key informant's interview was the main interview and all instruments were used in the main interview. The key informant was spouse in 50% of cases and 49% controls, followed by mothers in 22% and 24% of cases and controls, respectively. The key informants in 90% cases and 89% controls had been living with the subject for more than three years. The other sources of information were other informants, police records, postmortem reports, medical and psychiatric reports if available. If there was regular physical or mental health problem, a contact telephonic interview was conducted. Changes in the behaviour of the deceased weeks prior to death were explored with the informants; also whether there was any reference to self-destructive behaviour or plans. Data about somatic disease was also obtained.

Instruments

1. Personal Data Sheet: A semi structured questionnaire was used for both the victims and controls. The questionnaire was divided into 11 sections as below:

1. Demographics
2. Socio-economic status
3. Marital issues
4. Family details
5. Type of house
6. Liabilities
7. Losses within 1 year
8. Physical problems
9. Psychological problems
10. Previous suicide attempt
11. Current suicide attempt (only for victims).

2. Presumptive Stressful Life Events Scale (PSLE): This scale consists of fifty-one life events commonly experienced by normal Indian adult population (Singh et al, 1984). One hundred is the highest stress score and zero denotes no perceived stress. Scale items are further classified into (a) desirable, undesirable or ambiguous and (b) personal or impersonal (not dependent on the individual action). Reliability of PSLE scale (0.8) has been found to be satisfactory. Life events were assessed within six months prior to the suicide or interview.

3. Structured clinical interview for DSM III R (SCID) Non Patient Version (Spitzer et al, 1992): SCID was used for making the Axis I diagnosis. The principal diagnosis was arrived by using interference procedure when there was co-morbidity.

Statistical Analysis

The data were analyzed using the SPSS 10.0 software kit (Bryman, 2001). Significance was acceptable if Confidence Interval (CI) reached 95%. Comparisons of quantitative variables were done using Paired t- test & Wilcoxon Signed Rank test and qualitative variables were done using Mc-Nemar Chi-Square test. Risk factor analysis in the victims was performed by Logistic Regression Analysis.

RESULTS

Table-1 shows the comparison of socio-demographic characters between the victims and controls. Mean age of the "victim" group was 40.45+17.07 years and that of 'control group was 41.15+16.29 years. Both the groups were represented by 124 males 42 females respectively. There was no significant difference in the mean age, sex, marital status, religion, education, occupation and the monthly income between two groups.

Table 1: Socio-demographic characteristics: General

	Victims N=166	Control N=166	χ^2	p
Marital status				
Married	112	112		
Unmarried	39	39	1.798	0.965
Widow/Widower/separated	15	15		
Religion				
Hindu	118	111		
Christian	38	38	2.029	0.363
Muslim	10	17		
Education				
Illiterate	29	32		
Primary	79	62	8.78	0.067
High school	51	57		
Higher secondary and above	7	15		
Occupation				
Unemployed	9	12		
Farmer	38	40		
House wife	20	24		
Student	7	7	5.526	0.596
Daily wages	76	73		
Govt. Employee	13	5		
Business	**3**	**4**		
Monthly income in rupees				
Less than 2000	132	136		
2001-5000	21	20	0.475	0.788
More than 5000	13	10		
Nuclear family	111	118	0.690	0.406

P=NS

Table-2 shows that victims were more likely to be staying in own houses, not having own land, no own cultivation, migrated, had marital issues, staying separately, and had unsatisfactory relationship with family members.

Table 2: Socio-demographic characteristics: Specific Psychosocial Domains

	Victims N=166	Control N=166	χ^2	p
Migrated	91	72	4.351	**0.037***
Type of house staying				
Own house	125	130		
Ancestral house	25	32	8.158	**0.017***
Rental	16	4		
Own land	111	166	65.92	**0.000*****
Own cultivation	60	69	1.027	0.311
Social contact	164	164	0.000	1.000
Marred more than once	11	11	0.002	0.969
Dowry problems	67	71	0.355	0.552
Marital issues	42	14	17.853	**0.000*****
Staying separately	29	17	3.836	**0.050***
Family problems	75	48	9.42	**0.002****
Unsatisfactory relationship with family members	28	11	7.836	**0.005****

*p is significant at <0.05 level, ** p is significant at <0.01 level, *** p is significant at <0.001 level

Table-3 shows that significant number of victims had debt from private money lenders and individuals, past suicide attempts, more than one attempt in the past and family history of alcoholism. Comparison of life events between the two groups showed significantly higher score for total life events, undesirable, desirable, personal and impersonal life events in the victims (Table 4).

Table 3: Psychosocial stress, financial difficulties in the sample population

	Victims N=166	Control N=166	χ^2	p
Liabilities	111	119	0.906	0.341
Reason for financial loss				
Natural disasters	62	57		
Business loss	3	3	0.2196	0.700
Hospital treatment	17	26		
Debt from Nationalized banks	38	49	2.382	0.123
Debt from cooperative banks	49	27	0.04	0.948
Debt from private money lenders	23	11	4.327	**0.038***
Debt from individuals	37	18	7.209	**0.007****
Physical illnesses	36	33	0.165	0.685
Past suicide attempt	39	9	21.919	**0.000*****
More than 1 suicide attempt	22	2	26.876	**0.000*****
Family H/O suicide attempt	28	12	0.505	0.477
Family H/O alcoholism	46	22	10.652	**0.001****

Table 4: Comparison of life events in the sample population

	Victims Mean Rank	Control Mean Rank	p
Total score	1.7788	1.1969	**0.002****
Undesirable events	197.01	135.99	**0.000*****
Desirable life events	178.45	154.55	**0.013***
Impersonal events	179.92	153.08	**0.010****
Personal events	191.88	141.12	**0.000*****

Table-5: Psychiatric disorders at the time of death in the sample population

	Victims N=166	Control N=166	Odds ratio	95% CI	p
Depression	46	14	0.54	1.41-5.32	**0.002****
Alcohol dependence/abuse	54	24	2.74	1.10-4.65	**0.004****
Psychosis	7	3	1.17	0.37-1.94	0.833
Other psychiatric disorders	4	2	1.87	0.74-4.68	0.258

Table-6: Significant association in victims on logistic regression analysis

Factors	SE	Significance (p)
Migration	0.366	**0.003****
Marital Issues	0.474	**0.031***
Loneliness	0.535	**0.050***
Total LE score[#]	0.002	**0.000*****
Impersonal LE	0.003	**0.003****

[#]Life Events
*p is significant at <0.05 level
** p is significant at <0.01 level
*** p is significant at <0.001 level

Depression occurred in 28% of the victims and in 8.4% of the controls. 33% of the victims had alcohol dependence/abuse, while in the control being 14.4%. The prevalence of psychosis and other psychiatric disorders were negligible and comparable in both groups (Table-5). Table-6 shows significant risk factors for suicide in the victims on logistic regression analysis being migration, marital issues, loneliness, score of total life events and impersonal life events were significantly associated with suicide.

DISCUSSION

The present study shows significant differences in the psycho-socio-demographic profile between the victims and the controls. Even after controlling potentially important confounding variables, such as age, sex, marital status, domicile and income, a significant number of victims had problems with their spouse and relatives and were staying separately. Looking at the physical assets, majority were marginal farmers without having own land or cultivation. This means that they had to lease out land from big landlords for a huge sum to strive in the farming industry. In addition to that for sustaining their agricultural activities majority had taken loan with high rate of interest from private money lenders and individuals. Probably the economic concerns, government bureaucracy and unexpected bad outcomes in the crop might have contributed to the suicidal tendencies of these victims. This could also be the reason for high number of past suicide attempts especially more than one attempts in the victims. Indebtness and monetary concerns have been reported to be the major reasons for suicide among Indian farmers (Behere & Behere, 2008; Behere & Bansal, 2009). Study on farmers suicide from Punjab showed that majority of victims were small and marginal farmers and loners (Behere & Bhise, 2009).

Suicide may be seen as an escape from an intolerable, although probably transient, period of emotional turmoil triggered by recent adversity. Recent life events may act as precipitant stressors which may make the person to take the step from suicidal thoughts to suicidal actions. Life events analysis in the present study substantiates this fact with significantly high score for total life events including personal, impersonal, desirable and undesirable in the victims. The more the score of life events more seems to be the risk for suicide. Thus suicide seems to

occur when there is cluster of events implying more abrupt failures of coping mechanisms. The dominance of migratory population might have probably aggravated the adverse life circumstances as they did not have adequate support from their relatives or friends due to social isolation either in terms of material or emotional. Probably the adversities at their homeland may be the reason for this group to migrate to a new place for better prospects. Much more to reduce the social support, a good number of victims were staying alone (23%) due to various interpersonal problems such as marital issues (34 %), family problems (75%) and unsatisfactory relationship with family members (17 %). Heikkinen et al (1994) found that 80% of victims had experienced a life event in the preceding three months. In the Indian context Hegde (1980) found that 37.5% of completed suicides had marital or domestic problems. Banerjee et al (1990) found that quarrel with spouse was the commonest cause for suicide in India.

The present study revealed that there were not only large number of alcoholic suicides (33%), many of them came from alcoholic families as shown with significantly high family history of alcoholism in the first degree relatives (28%). Many of them have started consumption of alcohol early and were under the influence while committing suicide (30%). Probably alcohol is the easiest available modality for farmers to attenuate the day to day hassles. High prevalence of alcoholism in the suicide victims in general have been noted in earlier studies from India (Vijayakumar & Rajkumar, 1999; Kumar, 1998). Murphy and Wetzel (1990) noted that suicide is a late phenomenon in the course of alcoholism. The relationship between alcoholism and suicide is complex. It could be because of biochemical factors as well as situational factors. A chronic alcoholic in the course of his illness is more likely to face variety of stressors, interpersonal difficulties, weakening of social support, all of which could push the person to suicide. It needs to be mentioned that social drinking is not a way of life in India. Pondichery a state with a high rate of alcohol consumption also has the highest suicide rate (58%) of suicide in India (National Crime Report Bureau, 2009). Wasserman et al (1994) found that the suicide rate came down by 34% in 1984-1988 following strict restriction in the sale of alcohol in former USSR. Hence there is an urgent need to address this issue at the societal and individual level. Policies and programmes should be initiated for reducing the alcohol availability and consumption and at the individual level there should be better availability and follow up strategies for the treatment of alcoholics and their families.

In the victim's the presence of depression within one month prior to suicide was proved in 33% of the cases, which is significantly higher that of the controls (14.4%). However only 20% of these cases had major depression and the rest of the diagnoses were adjustment disorders. Therefore it is beyond dispute that in a significant number of suicides there was only minor psychiatric problems in the background but ratios mentioned in the literature seem to be exaggerated. The relationship between suicidal behaviour and psychiatric diagnosis has always been a matter of debate pertaining to Indian context with low rate of psychiatric morbidity. The psychiatric diagnosis depends on the method of identification and classificatory system adopted. Western literature reports that about 90% of all those who commit suicide suffer from a psychiatric disorder. A recent study conducted by Zonda (2006) 98% of those who committed suicide had a diagnosable mental disorder. In a series of studies from Indian context, the predominant psychiatric diagnosis was adjustment disorder closely followed by major depression and alcohol abuse or dependence (Kumar, 2004; Vijayakumar, 2003). Several of these attempts were of impulsive type and were done within hours of some triggering factor. Even in the absence of significant psychiatric morbidity, farmers were more likely to report that life is not worth living compared with general population and suicide in them was an end point to a series of difficulties accumulated over time (Walker & Walker, 1998).

It is important to emphasize this as it is possible that in countries without well developed economies, as a consequence of incomparable poor financial conditions and less effective social network, there may be more psychosocial stress in the background of suicides. This may be a possible reason for an under representation of severe psychiatric disorders in the background of suicides from developed countries (Jacob, 2008). This disposition could be clarified by a larger comparative study. However keeping the possibility of a treatable psychiatric illness behind every suicide we must endeavor to recognize and adequately treat depressive disorders in the population, and we are skeptical that it will cause a significant "medical breakthrough" in the fight against suicide (Isacsson, 2000).

Exposure to suicidal behaviour is increasingly considered to be risk factor for suicide. In this study 34% had a first degree relative who had committed suicide and many of them (24%) were exposed suicidal behaviour in their life time. More notably 13.2% had more than one attempt in their life time. In addition to the imitative effects, the occurrence of suicide in the environment may produce a familiarity with suicide where suicide is perceived as an acceptable alternative response or option to life stressors (Vijayakumar, 2003). Hence support to the vulnerable members of the family after suicide is necessary.

In the present study majority committed suicide by hanging (49.7%) closely followed by poisoning (39.6%). Hanging and insecticide poisoning appear to be the favorite methods in Indian suicides (Hegde, 1980; Kumar, 2004; Sathyavathi & Murthi Rao, 1962; Nandi et al, 1978; Shukla et al, 1990). Factors like feasibility, accessibility, credibility and rapidity of action and degree of suicide intent could be behind the choice of method for committing suicide. The availability of method becomes more important when the act is impulsive in nature. In the present study, majority being farmers had an easy accessibility to insecticides. Reducing the availability of means to commit suicide is an important suicide prevention strategy especially the free availability of insecticides over the counter. A decline in farmers suicide was recorded after introduction of fire arm purchase in 1989 in England, indicating the role of easy accessibility of dangerous means and rate of suicide (Thomas et al, 2003).

This study reveals that many of those who committed suicide had communicated their distress and intent (38.5%). The proportion of suicides recorded as having given warning is likely to be an under estimate as there may be others to whom the subject might have expressed suicidal intentions. Many factors such as literacy, inhibition, subjective urge to communicate their wish and the nature of circumstances may be contributory for expressing the intention to die. In the study conducted by Sathyavathi & Murthy Rao (1962) only 6.89% had expressions to intention die. Ponnudurai et al (1996) reported that 4.7% had written suicide notes prior to their attempts. Warnings have a preventive value in that one becomes aware of the problem, resources can be mobilized and preventive measures taken. Venue on suicide also has received little attention till date. Some time this aspect may offer a clue besides the individual's psychological states, about the intensity of suicide intent. In the present study majority had chosen their own house or house premises (75.7%) for the attempt. Similar findings have been reported earlier from India (Sahtyavathi & Murthy Rao, 1962; Nandi et al, 1978). These observations may be reflective of our socio-cultural traditions.

CONCLUSION

Major Strengths and Limitations of the Study

Close comparability of cases and controls especially with regard to important psycho-socio variables like age, sex, martial status, financial status and domicile. Utmost precaution was taken in the selection of informants who know actually about the patient and had been staying with the subject for minimum three years in most of the cases and the interview was conducted within three months after suicide thus enhancing the quality of information. Structured instruments were used for establishing the psychiatric diagnosis and for assessing the key risk factors. The main limitation is that though this study was done at the field level and some cases might not have been registered by police and hence may not have included.

Remedial Measures

- Appropriate remedial measures to solve financial difficulties
- Guidance for scientific cultivation
- Early detection and management of psychological problems especially depression and alcoholism
- Crisis intervention centers to counsel suicide prone individuals
- Restriction of availability of poisons only for agricultural purpose
- Limit the potency of poisons only for killing insects
- Add offensive odour to poison to vomit out in case of oral ingestion
- Start poison treatment centers in major hospitals
- Mobile poison management units
- Training for doctors in poisoning management
- Ensure consultation with mental health professional for all individuals admitted with suicide attempt

- Strict control over media against sensationalizing of suicides
- More research for formulation of culturally specific suicide prevention strategies

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