

FARMERS' SUICIDES IN INDIA: TRENDS, RISK FACTORS AND PREVENTION

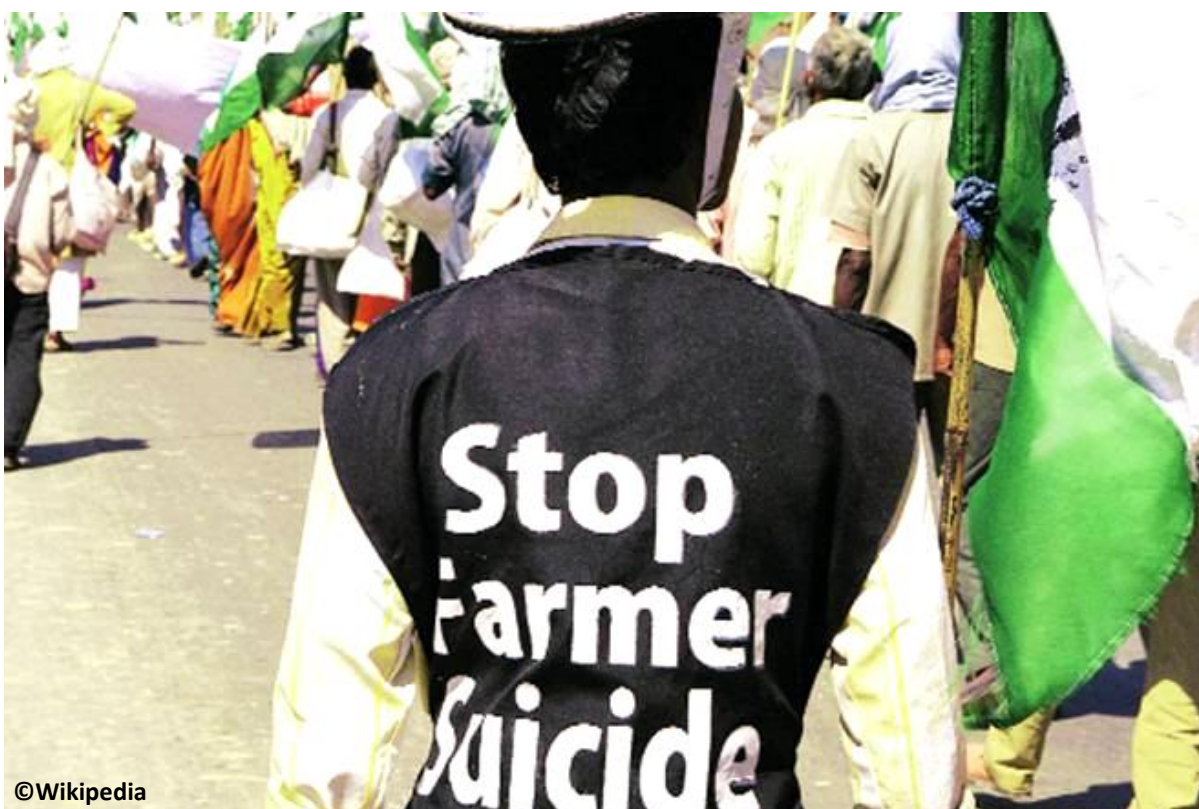


Increasing farm distress and the resulting farmer suicides are areas that need urgent attention. A key aspect of any suicide prevention strategy is our ability to understand the suicide process and manage the predisposing, protective, and precipitating factors so as to prevent these suicides. Extension services should play a crucial role in preventing farmers' suicides – by assisting them to fathom the stress and suicide process,

identifying vulnerable groups, providing telephonic advice and counselling, and creating community-based institutions that can educate and help farmers, argue P Sethuraman Sivakumar and P Venkatesan here.

CONTEXT

Despite its substantial presence and contribution to rural livelihoods, Indian agriculture faces several challenges. These include: shrinking size of landholdings, unstable markets, erratic climatic conditions, and a gradual decline in the availability and productivity of natural resources, which has currently led to a distress-like situation, which adversely affect the farmers. Farmers' suicides (Box 1) are becoming a major socioeconomic issue in India, leading to farmers' agitations and political debates. Farmers' suicides result in immeasurable social, psychological, and economic costs to families and rural communities (Lovelock and Cryer 2009). At the family level, farmers' suicides have caused breaks in children's education, development of anxiety and stress disorders in family members, reduction in household income in the Vidarbha region of Maharashtra (Kale *et al.* 2014), and in Punjab it has led to reduction in the size of operational holdings, loss of dairy animals, and significant yield reduction in high value crops (Singh and Singh 2016).



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Box 1: Farmer Suicides in India

Official estimates indicate that over 11,000 farmers are committing suicide every year, which is 11.2% of all suicides reported in India (National Crime Records Bureau 2015). The United Nations Commission on Sustainable Development (UNCSD) indicates that one farmer committed suicide every 32 minutes in India between 1997 and 2005. The details of farmers' suicides in recent years (2015, 2016) as compared with 2001 is displayed in Table 1.

Table 1. Farmers' suicides in India

No	State	Total No. of farmers' suicides			
		2001	2015	2016	% Change between 2001-2016
1	Punjab	45	124	271	502.22
2	Haryana	145	162	250	72.41
3	Karnataka	2505	1569	2079	-17.01
4	Gujarat	594	301	408	-31.31
5	Madhya Pradesh	1372	1290	1321	-3.72
6	Telangana	0.00*	1400	645	-
7	Maharashtra	3536	4291	3661	3.54
8	Andhra Pradesh	1509**	916	804	-46.72
9	Chhattisgarh	1452	954	682	-53.03
10	Other states	5257	1595	1249	-76.24
	Total	16415	12602	11370	-30.73

*Data not available for 2001; **Data for undivided Andhra Pradesh.

Source: National Crime Records Bureau, 2001; 2015; The Hindu Business Line, 2018.

Analysis of data presented in Table 1 indicates that farmer suicides are decreasing over the years, but showing an increasing trend in a few states like Punjab, Haryana and Maharashtra. Among the farmer suicide deaths reported in 2016, nearly one-third of these deaths were reported from Maharashtra (3661), followed by Karnataka (2,079), and Madhya Pradesh (1,321), as per data shown (The Hindu Business Line 2018). These states, together with Chhattisgarh, Andhra Pradesh and Telangana, have over 80% of the farmer suicides reported from India.

AGRICULTURE AS A STRESSFUL OCCUPATION

Agriculture is considered as a stressful occupation (Keating 1987), operated in complex, diverse and risk-prone environments. It also makes farmers vulnerable to physical, biological, chemical, mechanical, and psychological hazards (Gerrard 1998; Fraser et al. 2005). The National Safety Council, USA, cited agriculture as one of the leading occupations producing high stress among farmers (National Safety Council 2016) while farming was identified as the fourth highest risk occupational group in the UK (Kelly et al. 1995). Studies in the USA (US Dept. of Labor 1999), Canada (Pickett et al. 1999), and Australia (Fragar and Franklin 2000) have identified farming as one of the most dangerous industries (Gerrard 1998; McCurdy and Carroll 2000), and as being associated with high rates of stress (Simkin et al. 1998). Research studies conducted in several countries indicated that farmers are more vulnerable to stress and other psychological hazards which lead to suicide (Box 2).

Box 2: Suicides: Are farmers at a higher risk globally?

Farmers' suicides are reported as socio-economic problems in several countries, including Australia (Fragaret al. 2008; Andersen et al. 2010; Perceval et al. 2018), Brazil (Meneghel et al. 2004), Canada (Pickett et al. 1998), China (Law and Liu 2008), France (Bossard et al. 2016), New Zealand (Gallagher et al. 2007; Walker 2012; Beautrais 2018), Switzerland (The Local Ch 2018), UK (Charlton 1995; Thomas et al. 2003; Johnswire 2018), Japan (Nishimura et al. 2004), and USA (Kposawa 1999; Ivanova 2018).

There is growing evidence that farming is an occupation with a higher risk for suicide than other occupations (Milner et al. 2013). Two studies conducted among farmers of UK (Gregoire 2002; Thomas et al. 2003) found that the suicide rate among farmers was higher than in other occupational groups. Field survey revealed that the feeling of hopelessness in present life was two-and-a-half times higher among farmers than non-farmers. The suicide rate for Australia's male farmers is about double the general male population, sitting at 32.2 compared with 16.6 per 10,000 (Bryant 2018). Analysis of farmer suicides in Australia indicated that agricultural labourers and farmers/farm managers were identified as having higher suicide rates than those in other occupational groups (Fragaret al. 2008; Kennedy et al. 2014). Similarly, the New Zealand farmers engaged in crop farming, fisheries, and forestry had higher suicide rates than those in other occupations (Gallagher et al. 2007). In the UK, during the period 1993-2008, the relative suicide rate among farmers was 1.5-2.5 times higher than among the non-farming population (Hounscome et al. 2012). Farmer suicides are about 11% of the total suicides reported in India (National Crime Records Bureau 2015). The study conducted by University of Bern among 1.8 million Swiss men aged 35 to 74, estimated that farmers are 37% more likely than other men in rural communities to commit suicide (The Local Ch 2018). Similar trends were observed in China too (Law and Liu 2008). A recent study conducted by the Centers for Disease Control and Prevention (CDC), USA, found that workers in farming and related industries have the highest rate of suicide at 84.5 per 1,00,000 as compared to those in other occupations (McIntosh 2016).

Agriculture is a risky and stressful occupation mainly due to the following factors:

1. **Multiple Uncertainties** - Farmers are subject to the uncertainties of climate and other natural forces, unstable market conditions, changing consumer demands, fluctuating interest rates, and changing global agricultural conditions and policies.
2. **Diverse working conditions** - Farmers work for long hours in physically demanding environments under a range of varying light and weather conditions (McCurdy and Carroll 2000), with work practices involving high health risks including chronic exposure to pesticides and other chemicals (Von Essen and McCurdy 1998; Rautiainen et al. 2005) along with handling heavy farm machinery.
3. **Multiple work roles** - Farmers also hold multiple work roles in farms, households and off-farm responsibilities that are performed with limited time, resources and energy.

These factors make farmers vulnerable to hazards and mental problems such as high levels of stress (Booth and Lloyd 2000), depression and anxiety (Eisner et al. 1998), diseases like heart and artery disease, hypertension, ulcers, and nervous disorders (Fetsch 2018; Grant et al. 2009), physical injury and suicide (Booth et al. 2000; Page and Fragar 2002).

SOCIOECONOMIC RISK FACTORS AND PROCESSES ASSOCIATED WITH FARMERS' SUICIDES

Considering the nature of agriculture as a stressful occupation associated with high vulnerability of farmers to physical and psychological hazards, the suicidal behaviour of farmers need to be assessed. Several studies indicate that the suicidal behaviour of farmers is a context-based phenomenon caused through interplay of multiple biological, psychological, family, social, cultural, and environmental factors (Moskoset al. 2004; Bridge et al. 2006; Consoli et al. 2013). These factors

are largely influenced by country-specific production trends, demographic shifts, trade reforms and policy changes. The macro-level trends in Indian agriculture which influence farmers' conditions are as follows:

Box 3: Unfavourable trends causing stress to Indian farmers and agriculture

- **Predominantly smallholder farming**

Small and marginal farmers play a significant role in the Indian agriculture setup. In 2015-16, the population of small and marginal farmers was estimated as 126 million, who owned 86.21% of total landholdings representing 47.34% of the total agricultural area in the country (Govt. of India 2018). As the average landholding of small and marginal farmers is just 0.6 ha, maximising productivity of farming through input intensive agricultural technologies is a tedious task. The smallness of the holding straightaway denies the farmers the benefits of mechanization, modern irrigation, and other investment-based technological improvements. As a result, productivity is suboptimal leading to agrarian distress.

- **Indebtedness**

Farmers' prolonged indebtedness and shrinking ability to repay loans are predominant factors that create farmer distress in India. A NABARD survey indicates that the Incidence of Indebtedness (IOI), which is a proportion of households having outstanding debt on the date of the survey, was 52.5% and 42.8% for agricultural and non-agricultural households, respectively (NABARD 2018). The average amount of outstanding debt for indebted agricultural households was INR 1,04,602 in 2018, which was higher than the outstanding debt for indebted non-agricultural households (debt – INR 76,731).

- **Reduction in agricultural income**

Data from 2015-2016 show that the rural sector earned INR 8,059 as net household income during 2015-16 from cultivation, livestock, non-farm sector activities, and wages/salaries (NABARD 2018). The highest portion of the net monthly income was from wage labour (both farm and non-farm - INR 3,504), followed by government or private service jobs (INR 1,906), and agriculture (INR 1,832). For agricultural households, which accounted for 48% of rural households, the share of average income from cultivation and livestock farming was about 43%, with the remaining 57% of income coming from non-agricultural sources (NABARD 2018).

Suicide is the act of intentionally ending one's own life (Nock et al. 2008), which is essentially an outcome of harmful psychological processes. Suicide is seen as an extreme end to a continuum of psychological stress, distress, and tragedy for individuals, their families and communities (Boulanger et al. 1999). The suicidal process has several interlinked factors and events, such as a pre-disposition to risk or stress factors, onset of stress, poor coping ability of such individuals to manage stress, vulnerability of individuals to psychological hazards, occurrence of precipitating factors which trigger suicidal ideation (thoughts), which then leads to inhibition due to protective factors or suicide guided by facilitating factors.

Based on a critical review of studies conducted on farmers' suicide in different countries, a suicide model is proposed (Figure 1) integrating various predisposing, protective and precipitative factors of farmer suicides into the popular Clinical presentation of suicidal behaviour model (Shaffer and Pfeffer 2001) and the Model of stress, distress, and psychiatric illness (Terluin et al. 2004). The proposed suicide model presents a sequential view of various factors or events leading to a farmer's suicide. The various suicide factors depicted in the model are compiled from various studies conducted in India and abroad.

According to the Farmers Suicide Model (Figure 1), stress is the major reason that makes farmers vulnerable, leading to suicide. Various predisposing factors affect farmers in the long-term and create stress in them. Prolonged stress makes them vulnerable to physical and psychological hazards like depression. The vulnerable group of farmers are affected by unexpected precipitating factors, which influence their decision to commit suicide; it also depends upon the absence of protective factors.

Factors

(i) Predisposition to risk factors

Predisposing factors are those conditions or situations that increase the likelihood of farmer suicides. Predisposing factors induce long-term psychological stress in farmers which make them vulnerable to suicide. The predisposing factors associated with farmers' suicide include: genetic and biological factors, social and demographic factors, family characteristics and childhood experiences, socio-economic factors, presence of diagnosable mental disorders like depression and mood disorders, along with alcohol and substance abuse; psychological factors such as egoistic tendencies, impulsivity/aggressiveness, loss of control/stoicism; previous suicide attempts and presence of multiple stressful life events, long work hours, conflicting roles of work and family, poor access to health care services, social isolation and lack of social support; regulatory and industry factors beyond the farmer's control; and prolonged periods of climate variability with heat stress and drought (Fig. 1).

(ii) Precipitating factors

Precipitating factors are stressful events that can trigger a suicidal crisis in a vulnerable person. These factors cause or trigger the onset of a disorder, illness, accident, or behavioural response. A few precipitating factors which trigger farmers' suicide are: sudden crop failure, high job demands, breakdown in family relationships, current financial hardship, prolonged illness and pain, failure in business/politics, hopelessness, fall in social reputation, non-realization of expected market price, and unexpected disaster or sudden climatic change (Fig. 1).

(iii) Protective factors

Protective factors are those that decrease the probability of an outcome in the presence of elevated risk. Some of the protective factors which prevent farmers' suicides include: family and social support, social resources, religious beliefs, peer support, personality traits, coping skills, and a sense of belonging (Fig 1).

Processes

Psychological stress

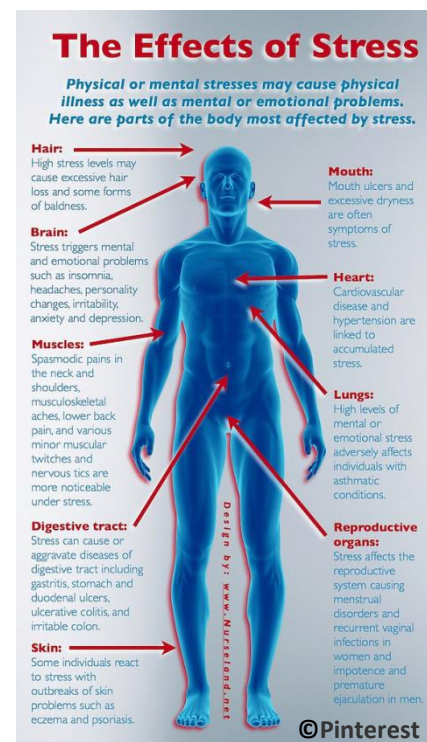
The psychological stress refers to the emotional and physiological reactions experienced when an individual confronts a situation in which the demands go beyond their coping resources. It is created due to occurrence of unexpected stressful situations.

Distress

Distress is an aversive, negative state in which the coping and adaptation processes fail to return an organism to physiological and/or psychological homeostasis (Carstens and Mober 2000).

Coping

Coping is the sum of cognitive and behavioural response of individuals to stress, which are constantly changing, that aim to handle particular demands, whether internal or external, that are viewed as taxing or demanding (Lazarus and Folkman 1984).



Vulnerability

Vulnerability refers to the inability of a person to withstand the effects of a hostile environment. It indicates physical and psychological deterioration including stress/distress conditions.

Suicidal ideation/suicidal thoughts

Suicidal ideation is thinking about or having an unusual preoccupation with suicide. Hopelessness, mood swings, anxiety, emotional pain and depression are a few symptoms of suicidal ideation.

Facilitation

The suicide facilitation factors include easy access to suicide methods, acceptance of suicidal behaviour, isolation, impulse, and evading treatment.

These factors and processes together determine a farmer's decision to commit suicide.

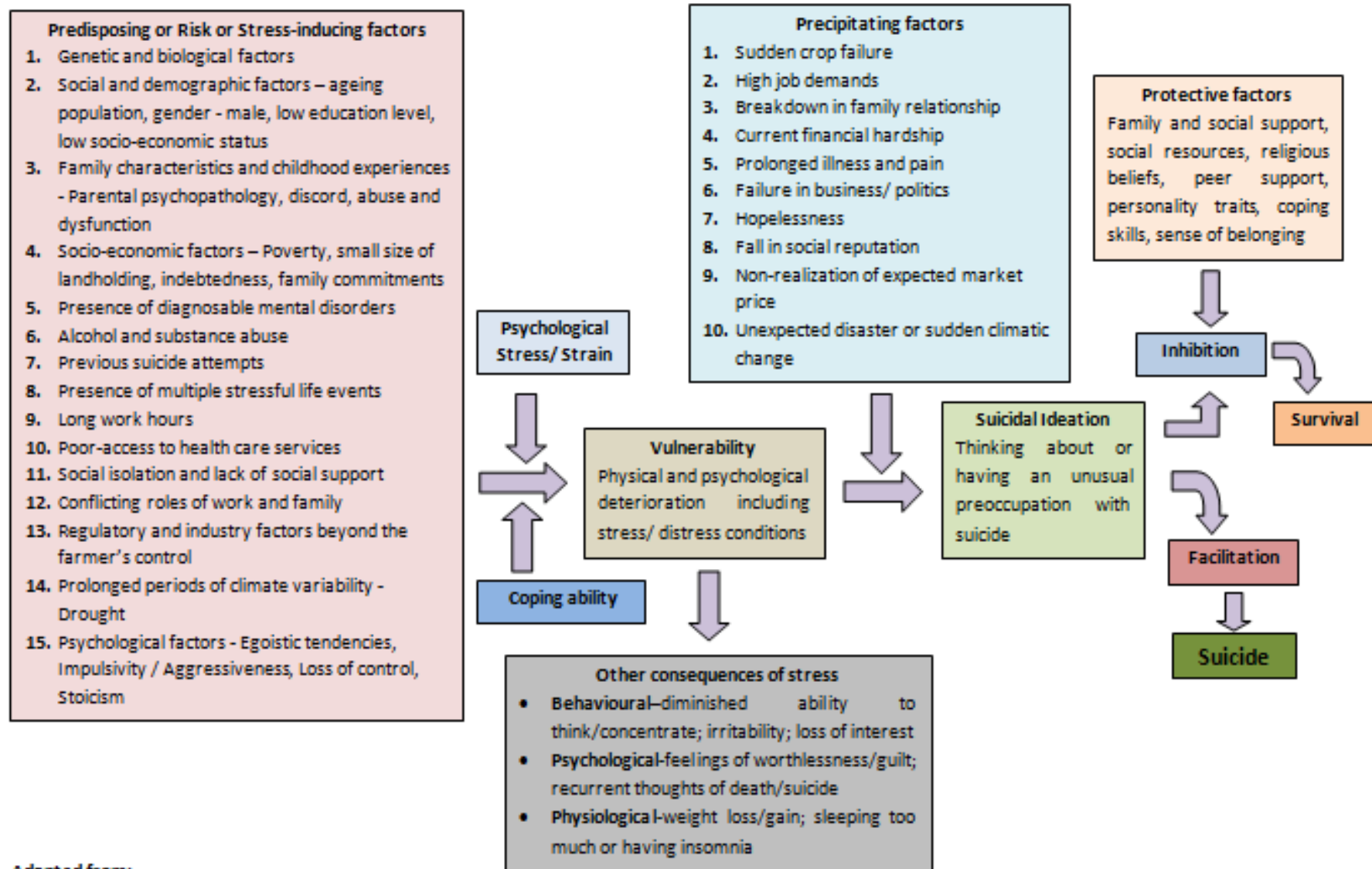
SUICIDE RISK ASSESSMENT APPROACHES

Farmers' suicides are caused by a complex interplay of various factors and occur at different stages of their life. An important aspect in preventing farmers' suicides is identification of the vulnerable population in advance, and helping them overcome their psychological stress.

Suicide risk assessment refers to the establishment of a clinical judgment of suicide risk in the near future, based on the weighing of a very large mass of available clinical detail (Pokorny 1983). Risk assessment is carried out in a systematic, disciplined way by qualified professionals.



Fig. 1: Farmers' Suicide Model



Adapted from:

National Crime Records Bureau (2015); Behere and Behere (2008); Bhise and Behere (2016); Kureshi and Somasundarm (2018); Dandekar and Bhattacharya (2017); Anneshi and Gowda (2015); Macharia (2015); Mohanty and Shroff (2004); Mohanty (2013); Meeta and Rajivlochan (2006); Deshpande (2002); Judd et al. (2006); Tonna et al (2009); Judd et al. (2006); Hossain et al.(2008); Fraser et al. (2005); Mc Shane et al. (2016); Hanigan et al. (2012).; Kunde et al. (2017); Manjunatha and Ramappa (2017); Sher (2006); Boergers et al. (1998); Eskin et al. (2007); M. T. Y. Lee et al. (2006); Wild et al. (2004); World Health Organisation(2018); Hawton et al. (1998); Judd et al. (2006); Ramesh and Madhavi (2009)

The assessment of suicide risk is based on identification and appraisal of warning signs, along with predisposing and protective factors that are present. Several methods, instruments and diagnostic tools are developed to assess farmers' stress factors, coping behaviour, vulnerability to suicide, and suicide ideation. A few resources are available to support the suicide risk assessment process, including clinical guides (Jacobs 1999; Rudd et al.2004) and best practice guidelines (American Psychiatric Association 2003; Heisel and Flett 2006; Registered Nurses' Association of Ontario 2009). A few suicide risk assessment scales and methods are displayed in Table 2.

Table 2. Farmers' suicide risk assessment scales and methods

No	Name of the scale/ method	Description	Source
1	Beck's Scale for Suicide Ideation	A 19-item rating scale measures active and passive suicidal desire as well as suicidal preparation.	Beck et al. (1988)
2.	The Modified Scale for Suicidal Ideation	This scale measures the presence or absence of suicide ideation and the degree of severity of suicidal ideas. The time frame is from the point of interview and the previous 48 hours.	Miller et al. (1986)
3.	Hospital Anxiety and Depression Scale (HADS)	To determine the levels of anxiety and depression that a person is experiencing.	Zigmond and Snaith (1983)
4.	Kessler Psychological Distress Scale	A 10-item measure of general distress during the previous 4 weeks.	Kessler et al. (2002)
5.	Farm Stress Inventory	A 61-page inventory measures farm stress in six dimensions, i.e., 1. Financial; 2. Weather; 3. Work overload; 4. Social; 5. Hassles; 6. Worry.	Walker and Walker (1995)
6.	Edinburgh Farming Stress Inventory	Assessing farm-related stress In six dimensions, i.e., 1) Farming bureaucracy; 2) Financial issues; 3) Uncontrollable natural forces; 4) Time pressures; 5) Personal farm hazards; and 6) Geographical isolation.	Deary et al. (1997)
7.	The General Health Questionnaire (GHQ-12)	Screening device for detecting various sources of distress and other minor psychiatric disorders in the general population and within community or non-psychiatric clinical settings.	Goldberg (1972)
8.	The Farm Stress Survey	A 28-item Likert-type summated rating scale measures farm stress in five dimensions, i.e.,1) economics;2) geographic isolation;3) time pressure;4) climatic conditions; and 5) hazardous working conditions.	Eberhardt and Pooyan (1990)
9.	Farm/Ranch Stress Inventory	A 28-item scale which measures farm stress in three dimensions – farm-related factors, financial factors and social factors.	Kearney et al. (2014)
10.	Stress Vulnerability Scale	A 20-item Likert-type summated rating scale, measures the individual's vulnerability to stress, that is, how much a person is prone to physical and psychological stress.	Miller and Smith (1985)
11.	Scale to measure resilience in relation to farmers' life (RFL-Scale)	A summated rating scale which measures Resilience - degree to which farmers can bounce back in relation to their life after a national calamity.	Lalet al. (2014)
12.	Psychological or verbal autopsy	It is a retrospective reconstruction of the life history of a suicide victim, which involves the examination of physical, psychological and environmental details of the victim's life in order to more accurately determine the mode of death and get a better knowledge of the death process and the victim's role in hastening or affecting his own death.	Behere and Behere (2008); Bhise and Behere (2016); Gajalakshmi and Peto (1997).

Conducting a farmer's suicide risk assessment, either for research or extension purposes, is a tricky process. It is important to pursue the following guidelines while conducting a farmer's risk assessment:

- The farmers' suicide risk assessment process involves collecting sensitive information from human subjects and this calls for approval from Institute Ethics Committees. It is important to follow the ethical guidelines laid out by the Indian Council of Medical Research (ICMR) (2017) to avoid problems in the future.
- Many assessment scales are copyrighted and involve costs in procuring and using them. Unauthorised use of assessment scales or other measures will invite legal issues.
- It is essential for researchers to undergo formal training before conducting a suicide risk assessment. It is a specialised process which needs deeper/sensitive understanding of the entire suicide process.
- Many suicide risk assessment scales or measures are standardised and have adequate reliability and validity across cultures. The suicide risk assessment is conducted by a psychiatrist, registered psychologists, or people who are adequately trained for this purpose. Indiscriminate use of these measures by unqualified persons will attract legal issues.
- When a researcher is interested in developing a scale or measure to determine any aspect related to farmers' suicides, it is essential to study all available measures or scales which have already been standardised. Developing a measure or scale for assessing risk factors of suicide is a complicated process as it requires Ethical Committee approval, and needs to be carried out under the supervision of a psychiatrist or a registered psychologist.

EXTENSION STRATEGIES FOR PREVENTION OF FARMERS' SUICIDES

Considering the magnitude and negative consequences of farmer suicides, many countries have opened up specialised services for preventing suicides. The extension services in USA, Australia and New Zealand provide stress management services to farmers. They provide the following services for reducing farm stress:

Information and campaigns on managing farm stress

This service is aimed at educating farmers about farm stress – its sources, identifying the symptoms, and measures to cope with stress. They provide links to various distress and suicide-related services in the county/state/country. The extension services also conduct campaigns to educate farmers about stress management and suicide prevention.

Suicide prevention hotline

This service provides opportunities for farmers to discuss their farm-related problems, which induce stress, and get advice through telephone or one-to-one counselling. The Iowa Concern programme of Iowa State University Extension and Outreach (<https://www.extension.iastate.edu/iowaconcern/>) provides stress counselling, telephonic advice on stress-related queries, managing legal issues of farmers and helping them to cope with stress in crisis situations.

Agricultural mediation services

Here the extension agency voluntarily acts as a third party in solving farm-related disputes outside the legal process. This service greatly reduces the stress involved in conflict resolution among farmers. For example, The Kansas Agricultural Mediation Services of Kansas State University Extension (Web: <https://www.ksre.k-state.edu/kams/services/mediation/index.html>) helps farmers to solve disputes in a peaceful manner. Likewise, the K-State Farm Analyst programme provides educational services to farm families to manage their finances and business planning.

Capacity building on crisis, risk and stress management and suicide prevention

Several extension services in USA, Australia, New Zealand, and in Europe conduct capacity building programmes for various clientele in managing stress and preventing suicides. Various academic and continuous education programmes are offered to many stakeholders for farm stress management and suicide prevention.

Single window system for farmers' health management

Under this system, the specialised agencies created for farmers' health management provide integrated services to farmers including counselling, stress and suicide-related education, capacity building, conducting workshops on stress and suicide prevention, conducting research on farmers' health and safety, and offering certificate courses on farmer health to develop a workforce for grassroots interventions. The National Centre for Farmers Health, Australia (<https://www.farmerhealth.org.au/>) and Farmstrong programme of New Zealand (<https://farmstrong.co.nz/>) are a few examples of this approach. Some farmers' federations like Victorian Farmers Federation, Australia (<https://www.vff.org.au/>), also provide integrated services for farm stress management.

Community-based suicide prevention programme

Community-based suicide prevention programmes are aimed to help communities to create interventions/projects to reduce farm stress and prevent self-destructive behaviours and conditions that lead to suicide, and to increase individual, family, and community health. These programmes offer grants, subsidies and bursaries to create infrastructure and facilities to develop competencies in farm stress management and suicide prevention on a community level. They also provide peer support services and counselling services for the community.

The Vidarbha Stress and Health Programme (VISHRAM) in Vidarbha region of Maharashtra, India, (<http://www.sangath.in/vishram/>), the Alaska Suicide Prevention Programme, United States of America (<http://dhss.alaska.gov/dbh/Pages/Prevention/programs/suicideprevention/default.aspx>) and Project Utshah, an initiative of the Department of Agricultural Journalism, Punjab Agricultural University (PAU), Ludhiana, under National Agricultural Science Fund (NASF) of Indian Council of Agricultural Research (ICAR), New Delhi, are a few examples of community-based intervention models for preventing farmer suicides.

CONCLUSION

Farmers' suicides are increasingly becoming a public health crisis in India. As agriculture is a relatively stressful occupation managed predominantly by small and marginal farmers with smaller operational holdings, stress factors both at the macro and micro levels have a severe impact on farmers' health. Suicide is not a discrete event caused by a sudden tragedy; it is rather an outcome of long-term accumulation of various stresses over a period of time. A key aspect of any suicide prevention strategy is our ability to understand the suicide process and manipulate the predisposing, protective, and precipitating factors so as to prevent the suicide. As a field-oriented profession directed towards farm households, extension services play a crucial role in preventing farmer suicides – by assisting farmers in understanding the stress and suicide process, identifying vulnerable groups, providing telephonic advice and counselling, creating community-based institutions to educate and help farmers, along with policy changes to help vulnerable groups. To conclude, these are a few strategies for preventing farmers' suicides in India.

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