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# FARMERS SUICIDES IN INDIA: A STUDY OF WARANGAL DISTRICT – A STUDY

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***Abstract***: *Suicide is a major public health concern resulting in premature deaths. Suicide was predominant among 35-45 years aged males and females aged 18- 30 years. The suicide method varied, males preferred self-poisoning while female committed suicide by self-immolation. Among males a summer peak while spring peak was observed for Non-Violent and violent methods respectively. The suicide in females peaked in autumn for the non-violent method while violent suicide was observed in summer. The Joinpoint regression analysis found no significant change in the suicide rate from the period (2010–2015) in overall population or stratification by gender for Warangal district, Telangana India. Suicide prevention strategies or interventions in the studied area could be initiated using the baseline data obtained during the present study.*

***Keywords***: *Suicide, Poisoning, Self-immolation, Suicide seasonality*

## Introduction

Suicide accounts for nearly 8 lakhs of deaths annually worldwide (WHO, 2018a). It is the second-leading cause of premature death among the 15–29 years age cohort and triggers a huge economic, social and psychological burden on families, communities, and countries (WHO, 2018a). Compared to other regions of the world suicide is highest in the South-East Asia region (WHO, 2014). It is estimated that 84% of the suicides occur in Middle and Low-income countries of which India and China alone contribute to half the suicide (Phillips & Cheng, 2012). The suicide rate of India spans from 11.2 per 100,000 population to 189.9 per 100,000 population (Jordans et al., 2014) and has augmented by 17.3% over the past decade (2005–2015) (NCRB, 2010–2015

and 2018). In India regional disparity in suicide is witnessed, majority aggregated within the Southern state of India (Patel et al., 2012). Telangana is the 29th state of India, constituted under the Andhra Pradesh Reorganization Act 2014. The state encompasses an area of 1.21 lakh square kilometers and a population size of 351.94 lakh (177.04 lakh male and 174.90 lakh females) (Census of India, 2018). In comparison to other states of India, Telangana recorded the 4th highest suicide rate; 26.7 per 100,000 population in 2014, moreover, it recorded the 3rd highest Suicide rate; 27.7 individuals per 100,000 population in 2015 which is higher than four neighboring Southern States and almost double the National Suicide rate (NCRB, 2010–2015 and 2018). The present study is aimed to characterize Suicide Deaths from the period of 2010–2015 by analyzing variables; Age, gender, suicide methods and seasonal variation for the suicide cases reported at a Tertiary care center located in Warangal district, Telangana.

**Research Methodology**

The Mahatma Gandhi Memorial Hospital is a 1000 bedded super specialty government hospital located at Warangal headquarters of Telangana state, India which provides medical facilities to residents of the Warangal district and neighboring territories.

Retrospective data (name, age, gender, residence, date of hospital admission, date of death and cause of death) of the suicide victims admitted to the emergency ward of the hospital during six years (1st January 2010 to 31st December 2015) was obtained from the medical records of Mahatma Gandhi Memorial hospital after permission from the hospital Superintendent. For data analysis, secondary data was stratified based on the year, age, gender, suicide methods, and type of suicide i.e. violent or non-violent and seasonality of suicide.

To determine which age group is borne upon the most by suicide, the cases were classified according to 6 age cohorts i.e., 1) less than 14 years; 2) 14 - 18 years; 3) 18 - 30 years; 4) 30 - 45 years; 5) 45-60 years and 6) 60 and above years (NCRB, 2010–2015 and 2018). The suicide methods were classified as either violent (use of firearm or shotgun, hanging, cutting and piercing with sharp objects, jumping from high places, getting run over by a train or moving vehicle) or non-violent (ingestion of Pesticide, Poison by gas, Suffocation, and overdose) (Sun & Jia, 2014).

For understanding the Seasonal variation of suicide, suicide cases were studied across four seasons i.e. winter (December, January, February), spring (March, April, May), summer (June, July, August) and autumn (September, October, November) (Coimbra et al., 2016). The differences in the distribution of Age cohort, suicide method and seasonal variation were measured by Pearson's chi-square test performed in SPSS version 20 (IBM –SPSS inc. Chicago, IL). The crude suicide rate per 100,000 population and the trends were described using joinpoint regression analysis by determining the

turning points for the 6 years (2010–2015) using freely available software Joinpoint Regression Program, Version 4.5.0.1 (NCI, USA, 2017). Negative Binomial regression was applied to compute Suicide relative risk (RR) and its 95% Confidence interval explained by independent variables; year (2010 as reference), gender (Female as reference) and suicide method (Violent method as reference).

**Findings of the Study**

One thousand three hundred twenty-five suicide cases (750 males and 575 females) over 6 years (2010–2015) were reported from various mandals (Sub-district/Taluk comprising of several village clusters) of Warangal district, Telangana, India. Five mandals; Atmakur, Geesugnda, Ghanpur (Station), Hanamkonda, Sangam reported the majority of the cases while the rest cases (less than 5%) were heterogeneously distributed across the remaining Mandals located at a greater distance. These cases were majorly reported from rural regions (1217 cases, 92.8%) than compared to urban regions (95 cases, 7.2%).

Overall suicide cases were reported highest in the 18- 30 years age group (34%) while least among the below 14 years age group (2%). Female of age cohort 18-30 years and male of 30-45 years age group had elevated suicide deaths compared to other age cohorts.

The seasonal pattern in suicide was observed i.e., maximum in summer (28%) followed by spring (26%) and autumn (25%) while least in winter (21%). The suicide method also illustrated seasonality, among males single peak in spring and summer was observed for violent and non-violent methods respectively. Among females, peak in summer and autumn was observed for violent and non-violent method respectively.

According to the method of suicide, 67% of the cases committed suicide by poisoning, 31% by self-immolation and 2% by hanging. Gender difference for suicide methods was observed, 83% of males preferred poison while 51% of females succumbed to self-immolation. Within a diverse range of poisons, keratolytic hair treatment preparation (5% females versus 1% males) and herbicides or fungicides (21% females versus 16% males) illustrated female predominance while in pesticide poisoning male predominance was observed (52% females versus 61% Males).

The suicide rate during the six years time frame (2010–2015) ranged from 3.67 to 8.40 for the overall population, for males ranged from 3.87 to10.40 while crude rate ranged from 3.48 to 7.13 for females. No significant difference in the trends (no significant change in annual percentage change and zero joinpoints) over the six years time frame was obtained in the Joinpoint regression analysis. The relative risk of suicide increased by 1 fold (non-significant) for the years 2014 and 2015 compared to 2010. Furthermore, 2 fold (non-significant) for poisoning cases than compared to hanging or self-immolation while no relative risk for gender was observed.

**Discussion**

Suicide is defined by renowned Clinical Psychologist and Suicidologist Edward. S. Schneidman as "the conscious act of self-induced annihilation, best understood as a multidimensional malaise in a needful individual who defines an issue for which the suicide act is perceived as the best solution" (Masango et al., 2008). WHO has recognized suicide as a public health concern and aims at 10% decrease in the burden of Suicide by 2020 (WHO, 2018a). Suicide rates diverge for countries due to the difference in the social and cultural background, availability of mental health services, and classification of death and accurate registration of suicidal deaths (Hawton & Heeringen, 2009). Globally suicide rate varies from 1.66 per 100,000 population to 36.2 per 100,000 population (Naidoo & Schlebusch, 2014) and for Indian states it varies from 11.8 per 100,000 population to 82.2 per 100,000 population (Badiye et al., 2014). The suicide rate of 8.4 per 100,000 population of Warangal district, observed in the present study seems to be much below the suicide rate reported by other studies. This could be due to the difference in the source, suicide data was collected from only one tertiary care from Warangal district and hence undermines the true picture of the entire district. Another reason could be the misclassification of suicide deaths as either unintentional or accidental death for poisoning cases. Furthermore among women due to the legal issues associated with Dowry death or death of women within 7 years of marriage suicide could be underreported (Patel et al., 2012). The Mental Health Care Bill introduced in the Rajya Sabha in August 2013 was passed recently in 2016 which decriminalized Suicide attempts and directed the government to provide rehabilitation to such individuals to thwart future reattempt (Rao et al., 2016). This would certainly improve the current scenario of both underreporting of Suicide and its associated psychological or economic burden on the Suicide attempter and his family.

In the present study, the temporal trend has an increase in overall suicide cases. As per unofficial records, during the struggle of Telangana for separate statehood, politically driven suicides were witnessed (India today, 2018) which would have added to the incidence of suicide during the studied time frame. Furthermore, an elevated suicide incidence in a rural area than compared to the urban area of Warangal district was observed. This observation is in concordance with studies conducted across various geographical regions i.e. Maharashtra (Batra, 2003), Orissa (Sharma et al., 2007) and Sikkim (Chettri et al., 2016). 17% of total farmer suicide in India, 1358 cases reported from Telangana state was a corollary of Bankruptcy or indebtedness, farming-related issues, prolonged illness and family problems (NCRB, 2010–2015 and 2018). Further, it is speculated that some of the farmers who entered modernized agriculture are weak in dealing and coping with the institutional channels of modernization without effective access to services like insurance, warehousing, post-harvest processing etc (Mohanty, 2013) Since the majority of the rural population in Warangal district is primarily engaged in agricultural-based activities (Census of India, 2018) the higher rural suicide reported in the present study could be due to the agrarian

crisis. The Telangana government has proposed a hike in compensation from 1.5 lakhs to 6 lakhs for families of farmer suicide (NDTV, 2018) which could have resulted in better reporting of suicide cases from the rural region of Warangal district, Telangana. Another possible reason for higher suicide cases in the rural region could be the dearth of immediate medical interventions or specialized medical staff required to deal with self-harm or suicide attempt case (Patel et al., 2012).

It is observed that the higher suicide rate among males than the compared female is in agreement with other epidemiological studies (Chettri et al., 2016) reporting 2–3 times higher suicide deaths among males than compared to the female counterpart. The gender difference in suicide mortality could be attributed to the difference in preference of more lethal and violent suicide method (Mergl et al., 2015), alcohol abuse and its intoxication at the time of suicide attempt (Menon et al., 2015). The method of Suicide varies across the region of the world; hanging, use of firearms, and poisoning with drugs among developed countries while pesticide self-poisoning in developing countries is the preferred suicide method (Ajdacic-Gross et al., 2008). Further unique patterns such as jumping from a building, charcoal self-immolation, drowning, railway deaths and self-immolation are observed in Asian countries which are absent in another region of the world (Wu et al., 2012). In the present study poisoning, self-immolation and hanging were the three most common suicide methods. Male predominance was observed in poisoning (nonviolent suicide method) while female predominance in Self-immolations (violent suicide method) the same observation was also reported by previous studies (Jaiprakash et al., 2011). In the rural region of India, women have access to combustion fuels i.e. kerosene, petrol etc., which are commonly used in cooking with stoves while males predominantly engaged in agricultural activities have easy access to Pesticides and other agrochemicals, therefore, self-immolation is common among females while Pesticide poisoning among males. Self-immolation has a socio-cultural root, in ancient India Jauhar and Sati (Vijayakumar, 2004). Hence it could be deduced that in the Indian context the preference of the suicide method is usually governed by availability, accessibility and socio acceptability rather than violence associated with the lethality of the method (Kanchan et al., 2009).

‘ Out of the various poisons, the pesticide was the most preferred poison, this observation is by earlier studies conducted in India (Patel et al., 2012;). Pesticide self Poisoning accounts for 30% of suicide globally and 20% of Suicides in Southeast Asia (Gunnell et al., 2007) to which WHO launched has Global Pesticide and Health Initiative recommending new pesticide policy, conducting epidemiological surveillance, developing programs to minimize pesticide poisoning and medical management of pesticide poisoning (WHO, 2018b). The promising approach to curtailing pesticide suicide mortality includes the withdrawal of more toxic pesticides (Zalsman et al., 2016). Further reduced accessibility and safer storage of pesticides in Communal storage centers (Ibid) would be effective as in India as in the majority of self-poisoning cases, poisons are obtained in or vicinity of home (Bose et al., 2009). Supervasmol 33™ an

inexpensive hair dye has emerged as a common suicide method popular among housewives (Chrispal et al., 2010) and the same was also observed in the present study. Public awareness of potential toxicity and proper toxicity warnings on hair dye packets could be initiated as preventive strategies (Ibid). Another notorious category is poisonous plant such as Yellow Oleander (Thevelia peruvianna) and Cleisthus collins (oduvanthalia) which are also reportedly consumed for self-harm in South India (Bose et al., 2009) and if poison is not detected or diagnosed the antidote could not be administered resulting in a fatality.

Seasonality in Suicide is reported from studies conducted around the globe (Dias et al., 2014) and the same was also observed in the present study. Hence suicide prevention strategies such as restriction of access to suicide methods, screening of risk population and strengthening of current medical emergency interventions could be initiated during the hotspot seasons of suicide. The hypothesis proposed to explain Suicide seasonality includes a Biopsychiatric approach according to which seasonality in suicide are attributed seasonal affective disorders or due to the effect of weather variables on neuroendocrine cycles (Ajdacic-Gross et al., 2010). Further according to the Social Psychological approach, suicide seasonality is determined by the intensity of the Social activity or could be due to failure to meet heightened expectations ahead of a new cycle of a year or simply by the opportunity to access the means of suicide example seasonal agricultural activity in rural region increases the opportunity to access Pesticide (Ibid).

**Conclusions**

The study highlights differential vulnerable age, suicide methods and seasonality of violent suicide across the two genders. These observations could be taken into account for formulating or strengthening existing suicide prevention strategies.

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