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Research Article

Socioeconomic Demographic Study of Suicide among the People in a Southern Town Berhampur of Odisha State (India)

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Abstract

Suicide is a worldwide problem affecting mostly the Asian countries like India. The aim of the present study was to specify the risk factors. The study was carried out on 434 established cases of suicide out of 1701 cases of all medico legal autopsies. Our study revealed a suicide rate 11.42 per 100,000 populations with male to female ratio 1.18:1. All the victims were Hindu with highest number reported between 21 to 30 years of age (34.33%). The victims were mostly illiterate (34.56%) of rural areas (74.19 %), low socioeconomic status (79.72%), mentally sound (86.4%), married (76%), and from nuclear families (51.84%), Housewives (30.65%) among female followed by laborers (25.81%) among male were the major sufferers. Family history of suicide, psychiatric illness, and physical illness, previous attempt of suicide, suicidal notes and hesitation cuts appear to be insignificant factors. Most of the incidents occurred in indoor (72.81%) during day time (59.22%) of summer (39.40%). A history of addiction was encountered in 37.33% cases. Two important methods of suicide were, poisoning (70.97%) with mostly ingestion of insecticide or pesticide (53.25%) followed by hanging (20.97%), where 81.32% of cases have used broad and soft ligature. The major causes of suicide were marital disharmony (22.98%) and financial burden (17.97%). Vitreous alcohol was positive in 20.33% victims. Victims belonging to blood group "O" were slightly prone to commit suicide. To conclude, our study points out some potential risk factors and their remedial measures.

Keywords: Autopsy; Suicide; Victim; Financial burden; Marital disharmony

Introduction

Suicide is defined as the deliberate taking of one's own life. Over 800,000 people die due to suicide every year and there are many more who attempts suicide. Suicide was the second leading cause of death among 15 to 29 year olds globally in 2012. In fact, 75% of global suicide occurred in low- and middle-income countries in 2012. Suicide accounted for 1.4% of all deaths worldwide, making it the 15th leading cause of death in 2012 [1]. The world suicide rate is 11.6 per 100,000 persons per year. Suicide rates differ significantly between countries and over time. Lithuania, Japan and Hungary have the highest rates. China and India, accounts for over half the total numbers of suicides [2]. According to the National Crime Records Bureau, India (2013) report on Suicides in India, the all-India rate of suicides is 11.0/100,000 and this rate has increased by 5.7% in 2013 over 2003 in which the rate was10.4/100,000. On an average, more than one hundred thousand persons committed suicides every year in the country during the decade periods (2003–2013). At par with national average the suicide rate in Odisha also has increased over the period to 12.6 in 2013 [3]. But this represents only the tip of the iceberg since the reported rates grossly underestimates the actual deaths of suicide because of non-reporting and under-reporting.

To love one's self is the inherent quality of each individual. When that person determines to end his or her own life, it points to the high degree of demoralization and fragmentation of the sane mind. The reason for the increased rate of suicide is complex; there are predisposing risk factors which foster a vulnerability to suicide as well as precipitating factors and protective factors which exert a countervailing influence. These risk factors exist at the individual level, the level of family, community and geographic region, are often interdependent and interactive and can manifest as suicidal thoughts, gestures or attempts or even a completed act. These factors may range from age, sex, personality trait, biological and genetic factor to the religious and social milieu, economic background, and moreover the ready availability of means for committing suicide at that point of time.

A lot of studies worldwide has been undertaken on this subject like in the USA, [4] UK and Wales, [5] New York, [6] Kentucky, [7] France, [8] St. Louis, [9] Hong Kong, [10] Australia, [11] Egypt, [12] Arhus, [13] Baltimore, [14] Eric country [15] and in other Asian countries like Singapore, [16] Pakistan [17,18] Turkey, [19] etc. And their views varied on different variables. In the Indian subcontinent in addition to the aforesaid factors, the law is very strict on suicide and different from the legal system of other countries. According to Indian law, a successful suicide is no offense, but attempt to commit suicide (S.309 IPC) and abetment of suicide (S.306 IPC) are treated as offenses. Similar studies were undertaken by different researchers [20-35] in many regions of India to postulate the important parameters responsible for suicide. In spite of all the steps taken against suicide

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in different countries, it appears that the rate is not substantially declining.

As it is a complex phenomenon the risk factors of suicide also vary according to the regional and other psychosocial problems. So far not much work has been undertaken either at the local level or at the Government level to point out the specific factors of suicide and to bring down the rate of suicide. Therefore present study has been undertaken to point out important risk factors responsible for suicidal and their remedial measures.

Materials and Methods

This prospective facility based study was conducted in 434 established cases of suicide out of 1701cases requested for postmortem examination in the Department of Forensic Medicine and Toxicology of M.K.C.G. Medical College, Berhampur, Odisha during a period of 2 years from Nov 2011 to Oct 2013. This is a referral center it receives dead bodies from the whole of the Berhampur city and adjacent areas comprising a population of 1.9 million approximately.

Few doubtful cases of alleged suicide where the cause of death could not be ascertained because of insufficient history, gross decomposition or inadequate findings excluded from the study. Information was obtained by interviewing accompanying persons and investigating officers, perusal of autopsy records and Bed head tickets and all the findings were noted down in a predesigned pro forma. This psychological autopsy was done in a very friendly environment, sometimes supplemented by visit to site of occurrence. In suspected poisoning samples of body tissues and fluid were collected, preserved and forwarded to the forensic science laboratory for Toxicological analysis. Blood grouping and qualitative estimation of alcohol in vitreous (dichromate test) was carried out in the Departmental laboratory except in decomposed bodies.

In the present study considering the educational status, the deceased has been classified as illiterate- who were not able to read or write, Primary- up to class V, higher Secondary -Class VI –X and College and above. Socioeconomic status was categorized as low for families having annual income of less than Rs 0.1 million, middle whose annual income falls between Rs 0.1 to Rs 0.3million and higher whose annual income exceeds Rs 0.3 million respectively. The season was divided into Winter (November to February), Summer (March to June) and Rainy (July to October) as per prevailing climatic condition of this locality The victims belonging to areas under Notified area council and Municipal Corporation were considered as an urban group while others reporting from Panchayat areas were considered as rural group The data so derived was analyzed and compared with the findings of other researchers.

Statistical analysis

Calculations were done using SPSS software in Microsoft excels. The data collected were analyzed by using the chi - square test. The p-value ($p \leq 0.05$) was considered as statistically significant.

Results

This study was carried out in 434 (25.51%) established cases of suicide. Our study indicates a suicide rate 11.42 per 100,000 populations. Males represent 235 cases and females represent 199 cases ($p > 0.05$) with male to female ratio 1.18:1. The peak incidence was observed in the age group 21-30 years (34.33%), followed by 11-20 years (24.65%) (Figure 1). Maximum victims were found to be married (76%), illiterate (34.56%), rural origin (74.19%) and from low socioeconomic status (79.72%) (Table 1). Housewives

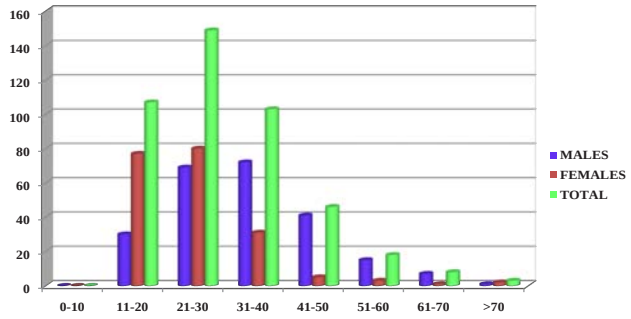

Figure 1: Age distribution.

Table 1: Sociological aspects of victims.

Marital status	**Total**
Married	330(76.04%)
Unmarried	96(22.12%)
Divorcee	2(0.46%)
Widow	0(0.00%)
Unknown	6(1.38%)
Total	434(100%)
X^2=4.17, df = 2, p= 0.124	
Occupational status	
Housewives	133(30.65%)
Labour	112(25.81%)
Semiskilled researchers	13(3%)
Govt. Servant	11(2.53%)
Businessmen	52(11.98%)
Student	21(4.84%)
Farmer	30(6.91%)
Dependent	32(7.37%)
Unemployed	24(5.53%)
Unknown	6(1.38%)
Total	434(100%)
X^2=307, df =8, p<0.0001	
Socioeconomic status	
Low	346 (79.72%)
Middle	82 (18.89%)
High	0 (0.00%)
Unknown	6 (1.38%)
Total	434 (100%)
X^2=13.53, df =2, p=0.0012	
Area of domicile	
Rural	322(74.19%)
Urban	106(24.42%)
Unknown	6(1.38%)
Total	434(100%)
X^2=1.38, df =1, p=0.24	
Place of occurrence	
Indoor	316 (72.81%)
Outdoor	118 (27.19%)
Total	434 (100%)
X^2=83.11, df =1, p<0.001	
Time of occurrence	
6am-6pm	257 (59.22%)
6pm-6am	171 (39.40%)
Unknown	6 (1.38%)
Total	434 (100%)
χ^2=0.004, df =1, p>0.05	
Type of family	
Joint	184(42.40%)
Nuclear	225(51.84%)
Staying alone	19(4.38%)
Unknown	6(1.38%)
Total	434(100%)
X^2=81.12, df =2, p=0.0172	

Table 2: Causes of suicide.

Marital disharmony	**Total**
Quarrel with spouse	83 (19.12%)
Dowry dispute	5 (1.15%)
Torture	10(2.30%)
Total	98(22.58%)
Financial burden	78 (17.97%)
Familial quarrel	71 (16.36%)
Sudden emotional outburst	
Quarrel with parents	6(1.38%)
Failure in exam	5(1.15%)
Failure in love	28(6.45%)
Death of near one	3(0.69%)
Others	4(0.92%)
Total	46(10.60%)
Psychiatric illness	53(12.21%)
Physical illness	5(1.15%)
Unknown	83(19.12%)
Total	434(100%)
X^2=98, df =12, p<0.001	

Table 3: Methods of suicide.

	Total
Poisoning	308(70.97%)
Hanging	91(20.97%)
Burning	19(4.38%)
Rail run over	9(2.07%)
Drowning	3(0.69%)
Stabbing	3(0.69%)
Firearm	1(0.23%)
Total	434(100%)
X^2=17.79, df =6, p<0.05	

(30.65%) among females and laborers in males (25.81 %) were the bulk sufferers. The majority of the victims (87.79 %) do not reveal a positive history of psychiatric illness. Only 3 cases out of 434 cases give a positive family history of suicide. In 72.81% cases the incident took place within four walls of their house. Maximum cases were reported during the day (60.60%) and in summer (39.40%). In 37.33% cases the victims were found to be addicted to various substances. The nuclear family (51.84%) accounts for more suicidal deaths than joint family. Hesitation cut marks and suicidal note were detected in only 2 cases each out of 434. The major causes of suicide were marital disharmony (22.58%), financial burden (17.97%) and familial quarrel (16.36%) (Table 2). In 70.97% cases poisoning was the method of choice, followed by hanging (20.97%) (Table 3). In 164 (53.25%) cases of poisoning, insecticides / pesticides were used and in74 (81.32%) cases of hanging, broad and soft ligature material were used. The victims belonging to blood group O (45.87%) are prone to commit suicide.

Discussion

In the present study 434 confirmed cases of suicide (25.51%) were taken as study material out of 1701 cases of all medico legal autopsies conducted over the studied period. This is quite high in comparison to studies at Turkey [19] and northern India [20]. But contrary to our finding a very high rate reports from other parts of India [21,32]. In our study revealed a suicide rate of 11.42 per 0.1million population. The derived rate appears slightly higher than the national suicide rate 2013 by NCRB [3] but lower than the world suicide rate (11.6 per 0.1million) [2]. But the rate appears quite high in comparison to the findings of researchers of a neighboring country, Pakistan (1.12/ 0.1million population) [17] but low as compared to the studies in eastern India [22,23,32] .Similar findings of an increase in rates have also been pointed out in Hong Kong [10]. The reason for moderate rise in suicide rate affecting this region could be due to increase in population, illiteracy, poverty, unemployment along with other associated psychosocial factors.

Sex wise analysis of data revealed that males are the major sufferers (54.15%), with the average male to female ratio 1.18:1. This ratio appears to be less than the findings in the USA, [4] England and Wales [5], Hong Kong [10], Australia [11] and Pakistan [18]. Similarly a male predominance was also suggested by different researchers in Kentucky, [7] Egypt, [13] Pakistan [17], Turkey [19] and in India [20,23,24,27,30,32] but a female predominance was found in studies elsewhere in India [22, 25, 26]. But in contrast to our finding almost equal ratio was found in Australia [11] and India [32,34].The male predominance is primarily due to increases in the male population. The other reasons like illiteracy, unemployment, poverty, frustration and prevailing social evils like female feticide cannot be ignored too.

All the victims were Hindus by religion, the principal reason for this could be due to the presence of lesser numbers of Muslim and Christian in this locality.

The most vulnerable age group was 21 to 30 years (34.33%) followed by the adolescent group, 11 to 20 years (24.65%) (Figure 1) which is almost similar to the findings observed by different researchers in countries like France, [8] Pakistan, [18] Turkey, [19] Egypt, [13] and in some parts of India [20.22,24,29,33]. Almost none or only a few cases were detected in extremes of age. The factors like frustration, sudden emotional outburst, failure to adjust with the stress and strain of life at a young age, poverty and especially in females, early marriage and giving birth to a child, sexual discrimination and dowry also seems to compel the victims to go for this crime at a young age.

We observed illiterates to be the maximum sufferers (34.56%) followed by the primary educated one (29.26%) (Figure 2) in tune with national studies [3], which appears similar to the findings of earlier studies by different authors in other parts of the Indian subcontinent, [25,28,34,35] but in contrast a greater incidence is reported from higher educated ones by some authors from South India [27,33]. This may be due to the prevalence of illiteracy even in parents, poverty, unemployment in this part of the world. Enforcing major decisions of life at a young age by the family members and inability to take such decisions of life because of illiteracy often plays a major role for the occurrence of this type of crime.

In our study 330 cases (76.04%) were married (Table 1). Similar marital predominance was detected in studies from the Indian subcontinent [24,25,32,33,35] but contradictory findings were detected in England & Wales, [5] Pakistan, [18] and also in

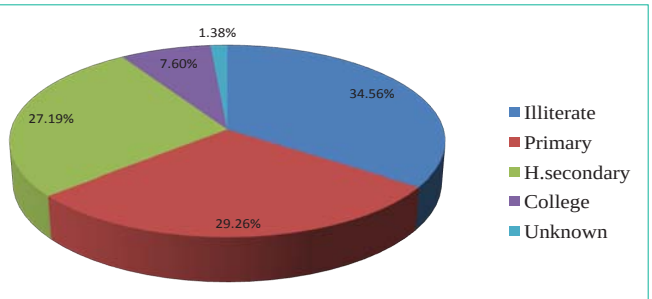

Figure 2: Educational status.

Chandigarh, northern India [28] The reason for the increase in marital suicide could be attributed to the prevailing standard of marriage at a young age, pregnancy, delivery, failure to take responsibilities of parenthood, giving importance to a male child, problems relating to dowry, ill treatment by the in laws, etc.

As regards occupation is concerned, we found housewives (30.65%) among females and laborers (25.81%) followed by businessmen (11.98%) among males are the major victims. Identical findings were also detected by some researchers while working in different regions of India [30,33,34]. This is contradictory to study in England and Wales [5]. The Employed persons were the least sufferers which suggest that poverty, financial hardship playing major role in the offense of suicide in this locality. In addition to this, damaged crops and easy access to means, especially at farmers also contributes much for suicide.

Most of the victims in our study, 79.72% were from low socioeconomic status followed by the middle income group (18.89%). Not a single case was encountered from higher socioeconomic strata, which is quite astonishing. Similar to our finding, studies undertaken elsewhere in other parts of India also revealed poverty to be the main reason of suicide [30,33,35] both in Indian subcontinent also contradictory findings observed by some researchers [27] while studying on urban and literate population. This depicts financial hardship as the main risk factor compelling the victims to commit suicide in this region. Beside these factors other factors like the rise in population, urbanization and change in lifestyle, increasing demands and failure to comply with the needs of dependents also contributes to a great extent for the commission of such act.

In contrast to the statistics that psychiatric illness as an important risk factor for suicide in Europe and North America by W H O [2], England and Wales, [5] some parts of India [30,33,34]. We found it only in 12.21 % cases. But similar low risk was suggested by studies elsewhere in northern India [32,35]. The reason for fewer incidences of psychiatric illness in victims could be due to ignorance, less health conscious, under reporting, poverty, illiteracy, due to social stigma attached to the psychiatric patients of this locality.

In our study only 3 out of 434 cases had a positive family history of suicide concluding that a positive family history has got almost no role in suicide affecting this locality, but contrary to our view a significant correlation was found in a study in urban Odisha, India [34].

The majority of the victims (71.4%) (Table 1) in our study were from a rural origin which appears similar to other studies in Odisha [32,34,35] but quite contrary to our view urban (70.2%) predominance was observed in northern India [29]. The possible causes for this urban predominance could be due to lifestyle changes along with other psychosocial factors like poverty, unemployment, illiteracy, easy access of means and high expectations in life.

Our findings suggest maximum incidences had taken place indoor (72.81%) which is similar to available literatures of India [32,35]. The causes for high indoor incidences may be a nuclear family, unemployment, working pattern of a husband, loneliness, easy availability of means and the idea of individuals to go unnoticed.

A diurnal predominance was observed in our study (59.22%). This is different from the studies undertaken elsewhere, like in USA, [4] and in South India [27,32,35] but an opposite view of nocturnal predominance reported by some researchers from southern India [33,35]. This type of variation can be due to advantage of loneliness, working pattern / education and easy access of means.

On seasonal variation we encountered majority of the cases (39.40%) from summer irrespective of the sex followed by winter (32.49%) and the rest were seen in Rainy season (28.11%) which is contradictory to studies conducted elsewhere in different countries [5,8,9,28]. A similar study in South India [27] suggested male predominance in 2nd quarter of the year and female predominance in the 1st quarter of the year. This high incidence of victims in summer can be due to the resultant effect of mental irritability, and resorting to sedentary lifestyle because of scorching heat leading to despair, quarrel and easy access by means like fertilizers at the end of the summer season.

Drug addiction was encountered in 160 victims (37.33%). Nicotine was consumed by majority 58 (13.36%), alcohol in 54 (12.44%) victims followed by a combination of both in 49 (11.29 %). Similar findings were observed at Saint Louis (25%) [9], other parts of India [24,32] indicating that drinking as well as smoking increases the risk for suicide. The major cause of addiction mostly involving males of this region may be due to frequent movement and easy availability of the addicted substance even in unlicensed shops.

Only 18 cases (4.38%) out of 434 cases of suicide reported a previous history of the attempt, which appears insignificant. Similar observations are reported from western India (5%-6.6%), but some literatures in southern India [32, 33] reported more cases with history of previous attempt. The reasons attributed to this could be due to the prevalence of illiteracy and the reluctance of people to accept the reality of taking alcohol.

The nuclear family accounts for 225 suicidal deaths (51.84%) in our study. Very few cases of suicides reported from staying alone (4.38%). Contradictory to our findings two literatures abroad in Baltimore [14] and Eric country [15] suggest more incidents in staying alone. The reason for this appears to be urbanization, poverty, changing family system, lack of family support, quarrel, mistrust and lack of guidance from elders in society.

In our study hesitation cuts and suicidal notes was found in only two cases each (0.46%) suggesting them as insignificant risk factors of this region. However study at Arhus [13] and Odisha, [32] India detected a high suicidal note in 25% and 5% respectively. The low incidence may be related to illiteracy, sudden emotional outburst and inadequate investigation.

Marital disharmony singled out to be the most important cause of suicide (22.58%) followed by financial burden (17.97%) and family dispute (16.36%) (Table 2). Although the categorization of causes differs from author to author, however, for comparison, in the present study, we have taken the most similar causes narrated by different authors. More or less similar findings of common causes of suicide being a domestic problem observed in neighboring country Pakistan [18] and different regions of India [21,22,25,28,33,35]. While a study undertaken in southern India [8] reported financial crisis (37%) followed by marital disharmony as common cause this appears

contradictory to our findings. The attributed reasons are poverty, unemployment, illiteracy, early marriage, dowry and torture by the in laws which are commonly prevalent in this part of the locality.

Poisoning (70.97%) is the most common method of suicide preferred to, by the victims followed by hanging (20.97%) (Table 3). Brutal and self mutilation methods of suicide like self stabbing, firearms and railway run over are rather uncommon in this region. But contrary to our finding violent methods were preferred in Arhus,[13] jumping and hanging in Hong Kong, gas poisoning in Australia, hanging in Faisalabad, firearm in South Carolina, USA[4] and Kentucky [7], fall from height in Singapore, [16] hanging in Turkey, [19] rodenticides in Egypt [12] . Findings of different northern regions in India [20,23,25,31,33] very much similar with our finding of poisoning as the main method, whereas hanging being the primary method detected in other regions of India [27,28,32,35]. Insecticide or pesticide intake was encountered in 53.2% cases of poisoning which almost tallies with findings observed elsewhere in India [32]. In 81.32% cases broad and soft ligature material was used for hanging, similar to the findings observed in western India (54.7%) [30]. The reasons for the adopted methods are culture, profession, cheap and easy access to means, inadequate legislation, inadequate facilities of hospitalization etc.

Qualitative Dichromate test for alcohol was positive in 20.33% cases out of 300 cases which is identical to another study at the present institute [32].The percentage appears to be quite high in comparison to studies at England,[5] New York(18%),[6] Eric(18%) [15] and in eastern India (5.5%) [35]. This relative detection of the high percentage of alcohol in vitreous could be due to extensive use, easy availability, inadequacy of strict laws and to some extent prevailing customs.

Blood grouping of only 207 cases was carried out keeping in view gross decomposition and availability of means. The percentage of different blood group found in our study more or less coincides with the respective blood groups as learnt from the study of Indian population [31]. Our study revealed that the victims with blood group "O" positive are slightly prone to suicide.

Conclusion

Suicide is a major public health issue of the world and especially in the developing countries like India. It is often impulsive compelling a person to end all his sorrows and tension at once by choosing the path of suicide. Although death is inevitable suicide is not the only option to end life. But in spite of all this candid fact, the people of this world at times opt for this because of many reasons, which are only best known to them. Exploration of the facts substantiates many causes of individual, family, society, and national level. But, in spite of all the attempts at different level the rate of suicide remains high pressuring researchers to give more thought on this.

In our study, we came across a lot of precipitating factors, which is directly or indirectly found to be responsible for suicide. The important factors which stand out are illiteracy, low socioeconomic condition, marital disharmony, familial dispute and easy access by means in cases of poisoning and hanging which are the two major methods of suicide in this locality.

Efforts are on and efforts shall also continue in the future in line of prevention. To combat this prior information and knowledge about the person suffering from suicidal tendencies, risk factors, along with an effective counseling is required to overcome this gigantic problem at the level of family or society. At higher levels, suicide prevention centers, better mental health provisions, are to be provided. All this primordial prevention is possible through program based training, marketing and awareness campaign at all levels. In addition to building a solid communication at grass roots level, especially at home holds the key to build a healthy child and curbing suicide in such individuals when they face the harsh realities of life subsequently. In spite of all the efforts, we have so far failed to a great extent in bringing down the suicides as expected, therefore research of this nature must go on, which shall be of immense help to predict the risk factors and draw preventive guidelines to bring down the suicide rate in the future.

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