Original Research Article

Manuscript title: Profile of suicide victims in Odisha- A tertiary care hospital based prospective study.

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Abstract:

Background: Suicide is death caused by injuring oneself with the intent to die. It is a worldwide menace affecting almost all strata of the society.

Methods and Results: The aim of the present study was to identify the demographic, social and other risk factors responsible for such an attempt. The study was carried out on 244 established cases of suicide out of 1340 cases of all medico legal autopsies. Out of them 97.9% of suicide victims was Hindu, with a male predominance and a male to female ratio, 1.37:1. Highest cases (45.49%) were in the age group 21 to 30 years. The victims were mostly illiterate (34.43%), married (74.18%); female victims were mostly housewives (66.99%) and male were labourers (70.08%). They were of low socioeconomic status and 83.6% belonged to rural background. 72.81% of the suicides occurred within the house, between 6AM – 2PM (40.57%). Majority (61.06%) had joint family, 59.84% victims were found to be addicted and maximum (29.92%) consumed mainly nicotine in form of Gutkha followed by both alcohol and nicotine in 22.95%. Two important methods of suicide were poisoning (140, 57.38%) followed by hanging (83, 34.02%). Quarrel with spouse contributes maximum 59(24.18%) incidences followed by marital disharmony due to dowry demand and financial burden (19.26% each). Marital disharmony is the single major cause in 31.07% of suicide amongst the female, whereas financial crisis is the main reason in 31.21% males. To conclude, our study points out some potential risk factors and their remedial measures.

Keywords: Autopsy; Suicide; Victim; Financial crisis; marital disharmony

Introduction:

Suicide is death caused by injuring oneself with the intent to die [1]. It is a worldwide menace affecting almost all strata of the society. It is a serious public health issue. Suicide rates increased 30% between 2000 and 2018, and declined in 2019 and 2020. Suicide is a leading cause of death in the United States, with 45,979 deaths in 2020. There is about one death every 11 minutes. [2] The number of people who think about or attempt suicide is even higher. In 2020, an estimated 12.2 million American adults seriously thought about suicide, 3.2 million planned a suicide attempt, and 1.2 million attempted suicide.[3] Suicide rates vary by race/ethnicity, age, and other factors, such as where someone lives.[3] As per NCRB data a total of 1,53,052 suicides were reported in India during 2020 showing an increase of 10.0% in comparison to 2019 and the rate of suicides has increased by 8.7% during 2020 over 2019.[4] Suicide and suicide attempts affect the health and well-being of friends, loved ones, co-workers, and the community. When people die by suicide, their surviving family and friends may experience shock, anger, guilt, symptoms of depression or anxiety, and may even experience thoughts of suicide themselves. [5]

To love one's self is the inherent quality of each individual. But when a person is highly demoralized and succumbs to the circumstances of life he /she chooses to end the precious life, it shows the pity state of a sane mind which fails to overcome the instant emotion of anger, failure and sometimes guilt.

Chronic stress during childhood includes living in impoverished neighborhoods, living in dilapidated housing, frequently moving, experiencing food insecurity, experiencing racism, and living in homes with violence, mental health, substance abuse problems, and other instability. In the absence of prevention or buffering through safe, stable, nurturing relationships and environments, changes in the brain architecture and function may result in

the early appearance and persistence of aggressive and antisocial behavior. These changes manifest in different ways at different ages. Exposure to chronic stress in childhood is also an important contributing factor to suicidal behavior in adolescence and adulthood. [6]The reason for the increased rate of suicide is complex; there are many predisposing risk factors which increases the vulnerability to commit suicide as well as precipitating factors and protective factors which exert a countervailing influence. These risk factors exist at all levels like individual, family, community and geographic region and they are often interdependent. These complexities of mind 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 religious and social to economic background, and moreover the ready availability of means for committing suicide at that point of time. The aim of the present study was to identify the different epidemiological parameters and risk factors leading to suicidal behaviour and common methods adopted by the people of this region to end their life.

Material and Methods:

The study is a prospective study carried out on all established cases of suicidal deaths produced for post-mortem examination with a police inquest report of suicide in the Department of Forensic Medicine and Toxicology of M.K.C.G. Medical College, Berhampur during the period of 1 year from 1st January 2021 to December 2021. In this study a total of 244 confirmed cases of suicide were included out of all medicolegal deaths that were produced for autopsy either directly or after hospitalization in Department of Medicine. The details history of the cases was taken from the relatives, related documents like Dead body chalan, inquest report and bed head tickets from Medicine Department of the hospital and photographs (if available) were perused and data was compiled and analysed using Microsoft excel sheet and other statistical methods. A few doubtful cases, with allegation of suicide

where the cause of death could not be ascertained due to insufficient history, gross decomposition, inadequate findings and unidentified victims were excluded from the study.

Results:

This study was carried out on 244 established cases of suicide out of 1340 total autopsies. The suicide cases amounts to 18.21% of all autopsies. Out of them 97.9% victims were Hindu. Table 1 reveals that males represent 141 (57.79%) cases and females represent 103 (42.21%) cases ($p > 0.05$) with male to female ratio 1.37:1. Maximum numbers (111, 45.49%) were in the age group between 21 to 30 years of age [Table 2]. The victims were mostly illiterate (84, 34.43%) and married (181, 74.18%) [Table 3 & 4] . Table 5 shows the occupation of the victims, where 66.99% female victims were housewives and male were mainly labours. 171(70.08%) victims were of low socioeconomic status [Figure 1]. Most (316, 72.81%) of the suicides occurred within the house [Table 5] and mostly between 6AM – 2PM (40.57%) as shown in Figure 2. Majority (204, 83.6%) belonged to rural background. [Table 6] and 149(61.06%) were members of joint family [Figure 3]. Housewives (30.65%) among female followed by labourers (25.81%) among male were the major sufferers [Table 7]. Table 8 shows 96 (39.34%) cases had no history of addiction while 146 (59.84%) victims were found to be addicted to either alcohol or nicotine or both. On sex wise analysis, males (115, 81.56%) were found to be predominantly addicted; whereas females were less addicted. Among all the common varieties of addiction maximum (29.92%) consumed nicotine (mostly Gutkha) followed by a mixture of alcohol and nicotine in 22.95% cases.

Two important methods of suicide were poisoning (140, 57.38%) with mostly ingestion of insecticide or pesticide (118, 48.36%) followed by hanging (83, 34.02%), where 73.49% of cases have used broad and soft ligature material [Figure 4].

Table 9 enumerates the causes of suicide, among the major causes quarrel with spouse contributes maximum 59(24.18%) followed by marital disharmony/ dowry demand and financial burden (19.26% each). Marital disharmony is the single major cause of suicide amongst the female (31.07%) whereas financial crisis is the main reason in 44 (31.21%) cases of males. Because of varied reasons, in 36(14.75%) cases cause of suicide could not be established leaving a grey area.

Only 11 (4.51%) cases out of 244 suicides give a positive history of previous attempt. Out of 244 cases, hesitation marks was found in 1 case and old scar of cut wounds over wrist found in 10 cases. Suicidal note was not found in any case.

Discussion:

Workers at different regions while comparing the percentage of suicide with total autopsies detected varied results. In Turkey, **Azmak et al (2006)** [7] showed 16% of all autopsies to be suicide and rate in males showed an increase over 5 years. Regarding this, studies in other parts of India like in Jammu by **Khajuria (2007)** [8] detected 16.4% of suicide in comparison to other types of deaths. We found 244 cases of suicide out of a total 1340 autopsies in the year 2021 that accounts for 18.21% of suicide, which appears to be similar to above study but in contrast **Rastogi et al (2010)** [9] in Jaipur pointed out 35.5% of all autopsies as suicide which is far more in comparison to our study. Our study suggests there is approximately one suicidal death in every three days, in this part of the world.

Studies by **William J.M.G. et al (1993)** [10] in England and Wales detected male to female ratio 3:1, **Yip P.S. (1998)** [11] in Hong Kong and Australia detected male female ratio 4:1, **Khan et al (2000)** [12] in Pakistan detected a ratio of 2:1, **Bennet et al (2000)** [13] in USA detected a ratio 3.9:1. All these study shows male: female ratio much more than our study (ratio 1.37:1). We found male predominance (57.8%) which is quite less than findings of

Shields L.B. et al (2005) [14] in (81.7%), **Azmak A.T. et al (2006)** [7] in 71.1%, **Gad El Hak SA (2009)** [15] in 67.5% cases in Egypt. However Shukla **et al (1992)** [16] at Jhansi detected a female predominance (34 per one lakh population). So also studies conducted by **Banerjee et al (1990)** [17] detected 79.3% of females to be the sufferers. Similar findings were also shown by **Lalwani S. et al (2004)** [18] in Delhi where female to male ratio was 1.24: 1. The male preponderance is primarily due to increase in population mostly involving the males, the other reasons which contribute for male suicide are illiteracy, unemployment, poverty, frustration and due to social customs like female foeticide which are very much prevalent in this part of the world. In the ongoing study all the victims were found to be Hindus by religion although along with Hindus a smaller percentage of Christians and Muslims do live here.

Worldwide scenario is no way different from our study where maximum numbers (111, 45.49%) were in the age group between 21 to 30 years of age. In developed country like USA a study undertaken by **Kachur et al (1995)** [19] described that suicide is the third leading cause of death in the age group of 15-19 years. At par with our study **Azmak A.D. et al (2006)** [7] in Turkey and **Gad El Hak S.A. et al (2009)** [15] in Egypt suggested that the most common age for the suicide is 20-30 years. **Sahu G et al (2008)** [75] detected female predominance in the age group of 16-25 years and **Kar N (2010)** [21] suggested involvement of younger age females more in the offence of suicide.

The reason for maximum sufferers in 21-30 years followed by 31-40 years may be due to, early marriage, frustration, sudden emotional outburst, failure to cope up with stress and strain of life at a young age, poverty and especially in females giving birth to child, sexual discrimination and dowry etc.

We in our study detected illiterates to be the maximum sufferers (84, 34.43%) followed by the primary educated one (79, 32.38%) and so on. **Kar N (2010)** [21] detected similar result as to our finding. Quite contrary to this and to our findings **Vijaykumar L (2010)** [22] in South India predicted a higher incidence of suicide in literate group. This could be attributed to prevalence of illiteracy, even involving the parents, poverty, unemployment, enforcing to take decision of life at a young age by the family members. We found marriage to be a predisposing factor, cause may vary like marriage at a young age, pregnancy, delivery, failure to take responsibilities of parenthood, giving importance to male child, problems relating to dowry, ill treatment by the in laws etc. But Khan **M.M. et al (2000)** [12] detected the offence to be common in unmarried males and married females respectively which is contradictory to our findings.

Studies by Kar N. (2010) [21] detected unemployment and study by **Vijaykumar L. (2010)** [22] found poverty as major cause. But we found quarrel with spouse 59 (24.18%) as principal reason which lead to suicide followed by marital disharmony/dowry demand and financial burden (19.26% each). **Khan M.M. (2000)** [12] singled out domestic problem at cause of suicide which tallies with our finding. **Chavan B.S. et al (2008)** [23] at Chandigarh found psychiatric illness in 33.65% of victims contrary to our findings. A positive family history of suicides in our study appears to be very negligible, contrary to this **Kar N (2010)** [21] established a significant correlation between family history of suicides with the offenders. **Sharma et al (2008)** [24] predicted drinking as well as smoking increases the risk in the individual to go for suicide. We also found (59.84%) victims to be addicted to either alcohol or nicotine or a mixture of both.

Only 4.51% cases gave a positive history of previous attempt which appears insignificant. **Sharma et al (2008)** [24] also got a similar result (5%) which almost tallies with our finding. **Azmak AD (2006)** [7] in Turkey detected hanging to be the most common

method followed by fire arm and poisoning this is in contrast to our findings where poisoning by insecticides/ pesticides was found to be the most common method of suicide followed by hanging. This may be due to the fact that easy and cheap availability of insectices and pesticide in this region due to agricultural practices.

Conclusion:

Suicide is a major public health issue of the world and especially of the developing countries like India. It is often impulsive compelling a person to end all his sorrows by suicide. We found various risk factors for committing suicide like illiteracy, unemployment, poverty, frustration, familial disturbances, marital discord, early marriage, dowry practices, chronic stress, childhood behavioural problems, easy availability of insecticides and pesticides and lack of awareness of mental health facility in society. The government should take appropriate measure to increase the literacy, income level, stringent laws for dowry system and may encourage social-emotional learning programs, parenting skill and family relationship programs.

In spite of many efforts, we so far have failed to a great extent in bringing down the suicides as expected, therefore research like ours must go on which may be of immense help for the betterment of the society at large.

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Sex	**Number of cases**	**Percentage**
Male	141	57.79%
Female	103	42.21%
Total	244	100

Table 1: Sex wise distribution

Age in years	Male	Female	Total
0-10	0 (0.00%)	0 (0.00%)	0 (0.00%)
11-20	17 (12.06%)	19 (18.45%)	36 (14.75%)
21-30	49 (34.75%)	62 (60.19%)	111 (45.49%)
31-40	39 (27.66%)	13 (12.62%)	52 (21.31%)
41-50	17(12.06%)	4 (3.88%)	21 (8.60%)
51-60	11 (7.80%)	2 (1.94%)	13 (4.15%)
61-70	7 (4.96%)	1 (0.97%)	8 (3.28%)
>70	1 (0.71%)	2 (1.94%)	3 (1.22%)
Total	141(100%)	103(100%)	244(100%)

Tab.2: Age and sex wise distribution

Education	**Male**	**Female**	**Total**
Illiterate	51 (36.17%)	33 (32.04%)	84 (34.43%)
Primary	38(26.95%)	41(39.80%)	79 (32.38%)
H. Secondary	25(17.73%)	26 (25.24%)	51 (20.90%)
College	19 (13.48%)	2 (1.94%)	21(8.60%)
Unknown	8 (5.67%)	1 (0.97%)	9 (3.69%)
Total	141(100%)	103 (100%)	244 (100%)

Tab.3: Educational status

Status	Male	Female	Total
Married	111(78.72%)	70 (67.96%)	181(74.18%)
Unmarried	28 (19.86%)	30 (29.13%)	58(23.77%)
Divorcee	0 (0.00%)	2 (1.94%)	2 (0.82%)
Widow	2 (1.42%)	1 (0.97%)	3 (1.23%)
Total	141(100%)	103(100%)	244(100%)

Table 4: Marital status

Place of occurrence	Male	Female	Total
Indoor	129 (55%)	187 (93.97%)	316 (72.81%)
Outdoor	106 (45%)	12 (6.03%)	118 (27.19%)
Total	141 (100%)	103(100%)	244(100%)

Table 5: Place of occurrence

Area of domicile	Male	Female	Total
Rural	102 (72.34%)	79 (76.70%)	181 (74.18%)
Urban	39 (27.66%)	24 (23.30%)	63(25.82%)
Total	141(100%)	103 (100%)	244 (100%)

Table 6: Area of domicile

Occupation	Male	Female	Total
Housewives	0 (0.00%)	69 (66.99%)	69 (28.28%)
Labour	50 (35.46%)	9 (8.74%)	59 (24.18%)
Semiskilled workers	10 (7.09%)	0 (0.00%)	10(4.10%)
Govt. Servant	5 (3.55%)	0 (0.00%)	5 (2.05%)
Businessmen	20(14.18%)	0 (0.00%)	20 (8.20%)
Student	10 (7.09%)	9 (8.74%)	19 (7.79%)
Farmer	20 (14.18%)	0 (0.00%)	20 (8.20%)
Dependent	18 (12.76%)	15(14.56%)	33 (13.52%)
Unknown	8(5.67%)	1 (0.97%)	9 (3.69%)
Total	141(100%)	103 (100%)	244(100%)

Table 7: Occupational status

Drug addiction		**Male**	**Female**	**Total**
Present	Alcohol	16 (11.35%)	0 (0.00%)	16 (6.56%)
	Nicotine	47 (33.33%)	26 (25.24%)	73 (29.92%)
	Both	51(36.17%)	5(4.85%)	56(22.95%)
	Others	1 (0.43%)	0 (0.00%)	1 (0.41%)
	Total	115 (81.56%)	31(30.10%)	146 (59.84%)
Absent		25 (17.73%)	71 (68.93%)	96 (39.34%)
Unknown		1 (0.71%)	1(0.97%)	2 (0.82%)
Grand total		141(100%)	103 (100%)	244 (100%)

Table 8: Addiction status

Causes of suicide	Male	Female	Total
Marital disharmony/ Dowry	15(10.64%)	32(31.07%)	47(19.26%)
Quarrel with spouse	34(24.11%)	25(24.27%)	59(24.18%)
Quarrel with parents	8(5.67%)	17(16.5%)	25(10.25%)
Financial crisis	44(31.21%)	3(2.91%)	47(19.26%)
Failure in love	4(2.84%)	3(2.91%)	7(2.87%)
Failure in exam	1(0.71%)	1(0.97%)	2(0.82%)
Psychiatric illness	5(3.55%)	8(0.71%)	13(5.33%)
Physical illness	2(1.42%)	6(5.82%)	8(3.28%)
Unknown	28(19.85%)	8(7.77%)	36(14.75%)
Total	141(100%)	103(100%)	244(100%)

Table 9: Causes of suicide

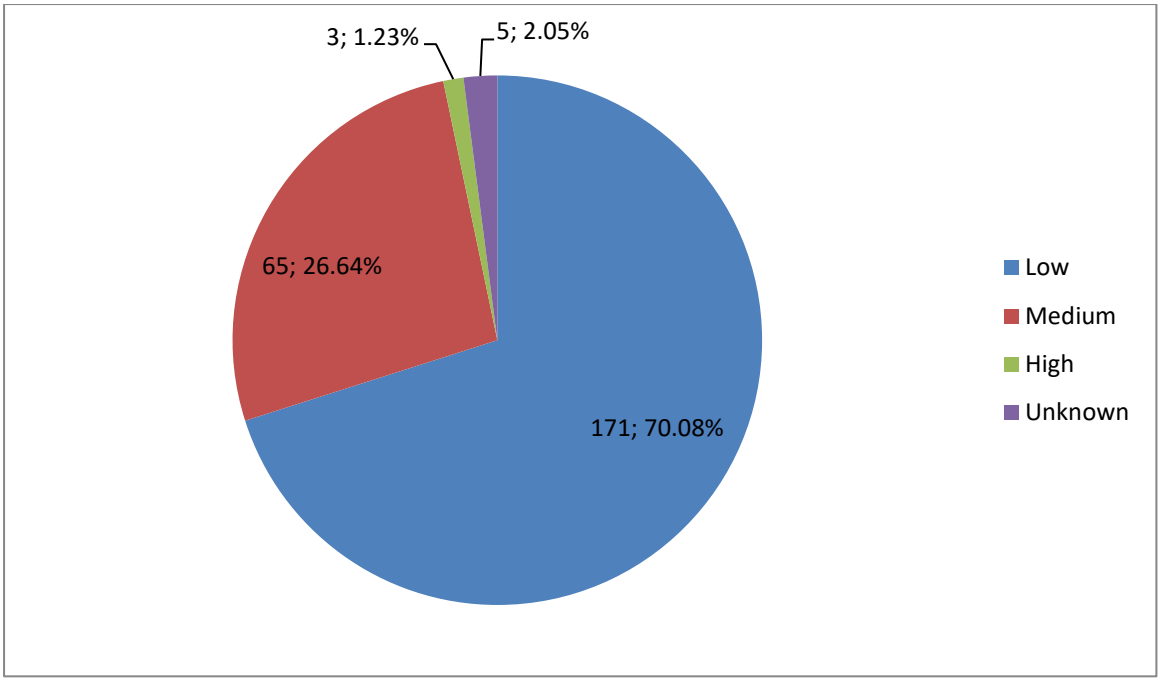

Figure 1: Socioeconomic status

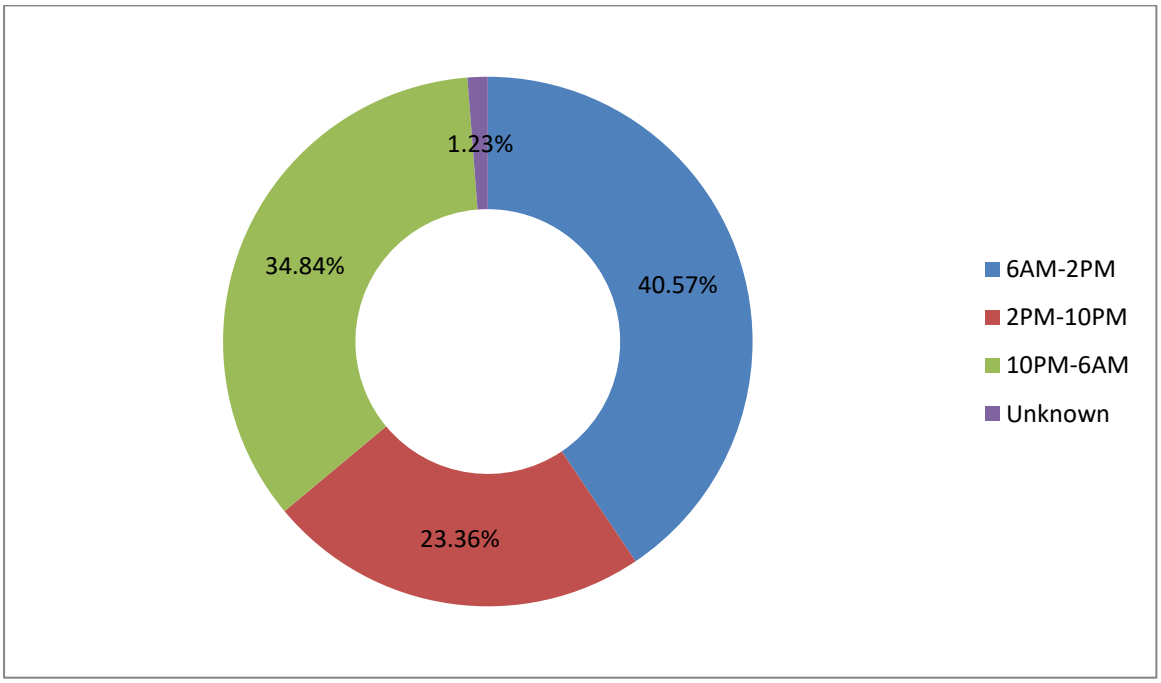

Figure 2: Time of occurrence

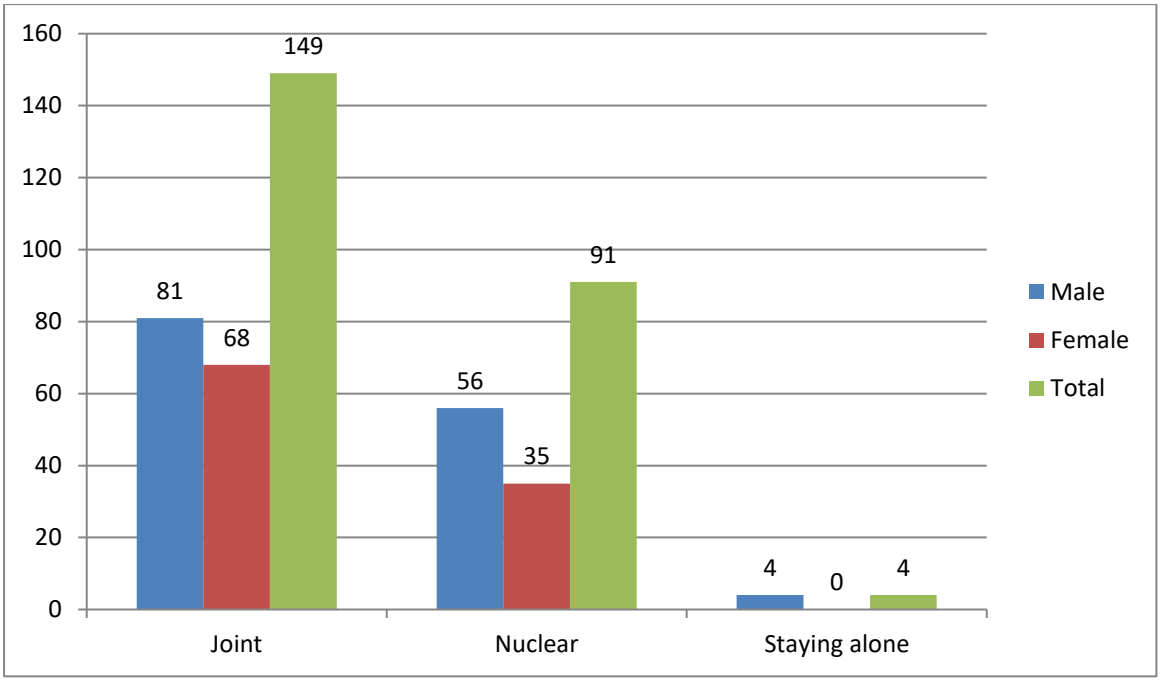

Figure 3: Type of family

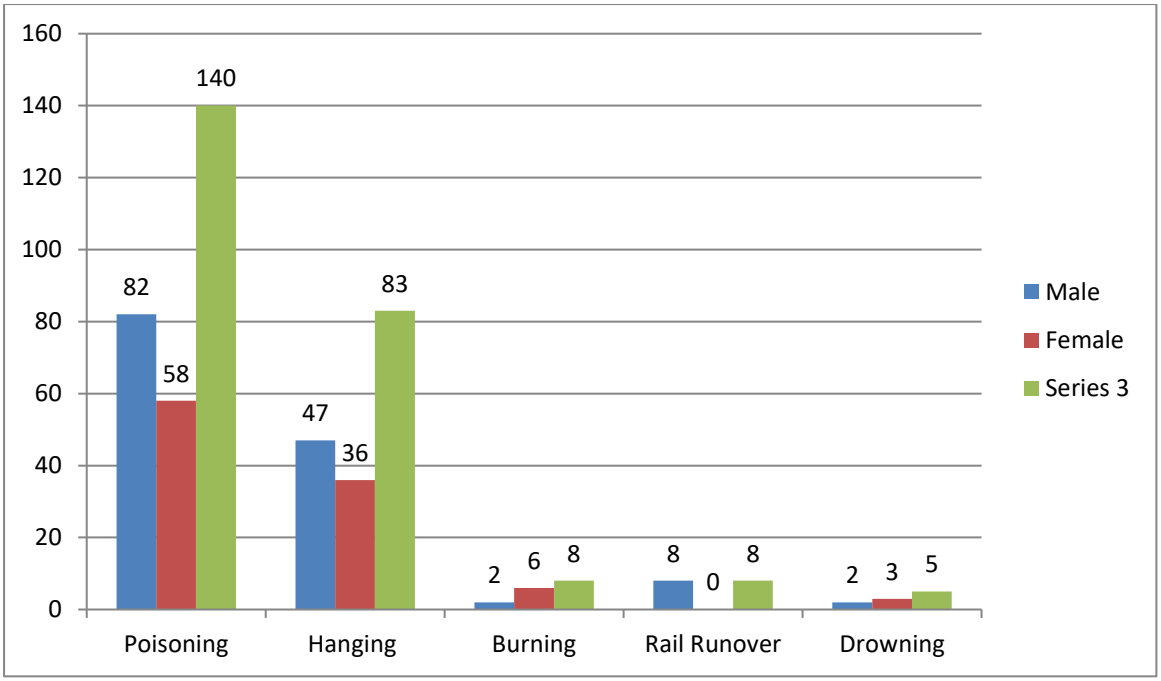

Figure 4: Methods of suicide