

# **FATAL DELIBERATE SELF HARM IN MANIPAL, INDIA: AUTOPSY STUDY**

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## **ABSTRACT**

Fatal deliberate self harm (FDSH) or Suicide is a devastating act causing a great deal of suffering to survivors, relatives, friends and other people near to the victim of suicide. It is also a public health problem causing loss of life years, particularly in young people. In most countries suicide is condemned for cultural or religious reasons and surrounded by taboo (WHO 2002).

The present study sample consisted of 656 cases of fatal deliberate self harm (FDSH) out of the 3571 total autopsy cases. The occurrence of FDSH was 18.37% of all the medico-legal autopsies conducted (3571 cases) during the study period (1992-2012). The present study shows that the people of all age groups were involved. The highest incidence was amongst the 21–30 years (35.06 %) followed by 31–40 years (19.35 %). Male victims predominated. Of these 656 cases, 436 (66.5%) were males and 220 (33.5%) were females. Present study predicts marriage as being one of the important risk factors for suicide. 417 cases out of 656 cases (57.3 %) were married. Most of the victims belonged to the Hindu religion (86.4 %) followed by Christians (8.4 %) and Muslims (3.7 %). When we look at the presence of any past illness, 174 cases (26.5%) were having some form of chronic physical and mental disorders at the time of committing suicides. Although seasonal variation is not much, however the present study reveals highest number of cases in summer season (36.1%), followed by the winter, the rainy season. Despair with life due to financial restraints and family and marital disharmony constituting 79 % of the total cases was the most common motive for FDSH. 74.4 % of the total victims in the present study used chemicals for terminating

their lives and only 26.8 % of the study group used physical methods for committing FDSH. Amongst those who opted for physical methods, hanging was the most common (15.6 %) followed by burns (7.1 %). Among the poisoning cases, organ phosphorus poisoning (51 %) was the most commonly used method for suicide

## **INTRODUCTION**

Suicide (self inflicted death) is a complex phenomenon associated with psychological, biological and social factors involving by and large every corner of the world. It is distinctively a human affair and continues to be a major public health issue. It has always attracted the attention of not only the medical fraternity but also of the philosophers and theologians.<sup>1,2</sup>

According to Durham, the French biologist, suicide is “death resulting directly or indirectly from a positive or negative act of the victim himself, which he knows will produce this result”. Suicide from an existential point of view reflects a behavior that seeks and finds the solution to an existential problem by making an attempt on life of the subject. Suicide is applicable to all acts terminating fatally.<sup>1,2,3</sup>

A 2006 report by the World Health Organization (WHO) states that nearly a million people take their own lives every year, more than those murdered or killed in war. Suicide rates are highest in Europe's Baltic states, where around 40 people per 100,000 die by suicide each year, second in line is in the Sub-Saharan Africa where 32 people per 100,000 die by suicide each

year. The lowest rates are found mainly in Latin America and a few countries. In most countries the incidence of suicides is higher than that in Asia, So also in India the National crime research Bureau (NCRB), 2010, in their annual report on Incidence and Rate of Suicides during the Decade (2000-2010) have reported that, more than one lakh persons (1,34,599) in the country lost their lives by committing suicide during the year 2010. This indicates an increase of 5.9% over the previous year's figure (1, 27,151).

The number of suicides in the country during the decade (2000–2010) has recorded an increase of 23.9% (from 1, 08,593 in 2000 to 1, 34,599 in 2009). The increase in incidence of suicides was reported each year during the decade except in 2001. The population has increased by 18.3% during the decade but the rate of suicides in 2010 was 11.4 which are greater than 10.8 recorded in 2000. The rate of suicides has shown a declining trend since 2000 to 2003. An increasing trend is observed during 2006 to 2010. There were 369 suicide cases every day and 15 Suicides took place every hour, in spite of the fact that suicide is still considered a crime under section 309 Indian Penal Code.<sup>6</sup>

Considering these facts, and keeping in view the magnitude of this problem, an attempt has been made in the present study to make a complete and thorough analysis of deliberate self harm in terms of various epidemiological features, recent trends and to identify the risk factors associated with it

## **MATERIALS AND METHOD**

Present study is both prospective (October 2010 – May 2012) and retrospective (January 1992 – October 2010) over a span of 20 years (January 1992- May 2012). The department of Forensic Medicine in Kasturba Medical College, Manipal undertakes medico-legal autopsies of un-natural deaths occurring in its Jurisdiction of Manipal Police Station and also takes cases referred from the adjoining districts and states of southern India. In case of retrospective study relevant data regarding the suicide was gathered from the autopsy files maintained in the department of Forensic Medicine, Police inquest reports and Hospital case records (if available). In case of prospective study, along with the above mentioned data, information was obtained from close relatives of the victims present at the mortuary as regarding the motive of the act and other relevant questions.

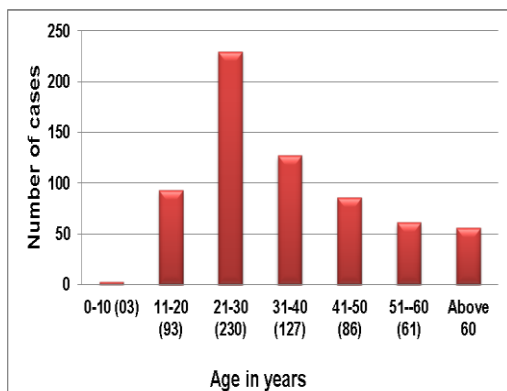
The manner of death was constructed as suicide or otherwise based on the inquest reports of the investigating officer

## **RESULTS AND OBSERVATIONS**

A Total 3571 cases were autopsied in the department of Forensic Medicine, Kasturba Medical College, Manipal, Karnataka during the period of 20years from January 1992 to May 2012, out of which 656 were cases of Fatal Deliberate Self Harm (FDSH) or Suicide constituting 18.37 % of total cases as depicted in Table No. 01.

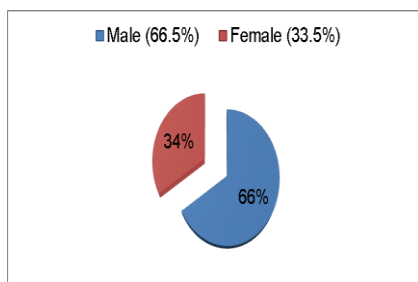
**Table 01: Total number of autopsies**

Year	Total number of autopsies	Suicide cases	Percentage (%) of suicide cases
1992	35	5	14.2
1993	157	18	11.46
1994	174	30	17.24
1995	154	34	22.0
1996	181	38	20.99
1997	174	39	22.41
1998	154	36	23.37
1999	161	43	<b>26.70</b>
2000	163	35	21.47
2001	199	43	21.60
2002	158	34	21.51
2003	113	19	16.81
2004	129	20	15.50
2005	141	21	14.89
2006	154	16	10.38
2007	151	25	16.55
2008	196	30	15.30
2009	233	32	13.73
2010	301	54	17.94
2011	308	57	18.50
2012(up to May)	135	25	18.51
<b>Total</b>	<b>3571</b>	<b>656</b>	18.37



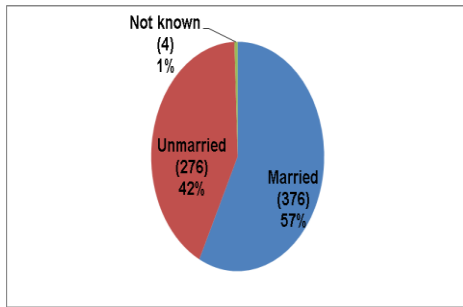
**Figure 01: Age of victims**

In our study, we observed that the highest incidence of suicide cases were found in the age group of 21-30 years which accounted for 35.06 % of total cases, followed by the age group of 31 to 40 years. The least affected group was 0-10 years who accounted for 0.45 % of total cases, as depicted in the **Fig. No. 01**



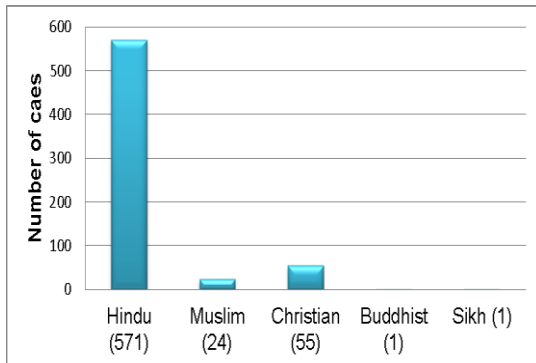
In our study, we observed that men outnumbered women, as depicted in the **Fig. No. 02**.

**Figure 02: Gender distribution of the victims (n = 656)**



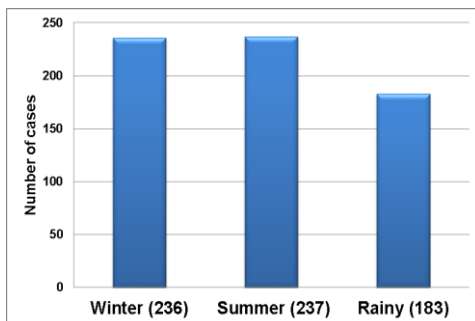
Our study showed that most of the decedents were married which accounted for (57.3 %) of all the cases of Fatal Deliberate Self Harm (FDSH), as depicted in **Fig. No. 03**.

**Figure 03:** Marital Status of the victims



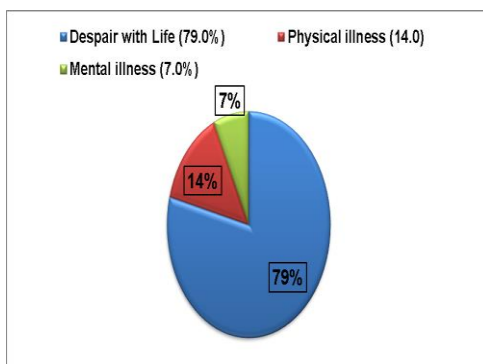
Most of the victims in this study were followers of the Hindu religion who accounted for 86.9% of all the cases of Fatal Deliberate Self Harm (FDSH), followed by the Christians 8.4 %, Muslims 3.7 % and others 0.30 % respectively, as depicted in the **Fig. No. 04**.

**Figure 04:** Religion of the victims.



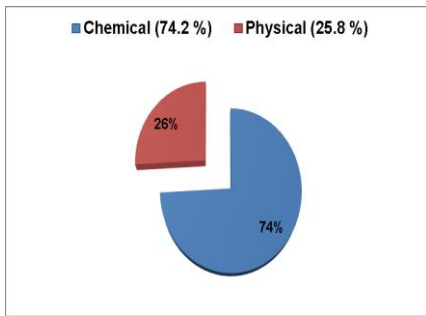
36.1 % of the victims committed Suicide during the Summer months, closely followed by the winter season which accounted for 36.0 % of all the cases, rainy season witnessed the least number of fatalities 27.9 %. **Fig. No. 05**.

**Figure 05:** Seasonal variation in FDSH



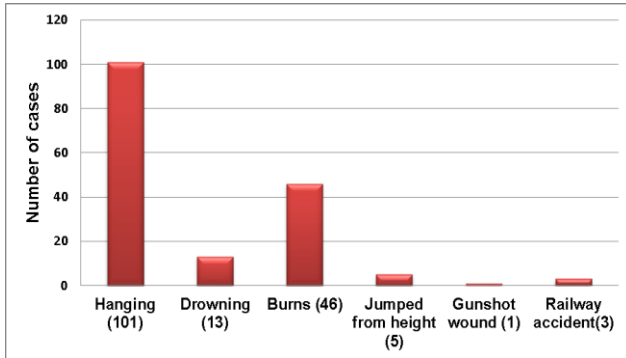
Present study observed that despair with life was the main motive for FDSH in 79 % of victims. Physical illness and Mental illness accounted for 14 % and 7 % of the total cases respectively in **Fig. No. 06**

**Figure 06:** Motive for FDSH.



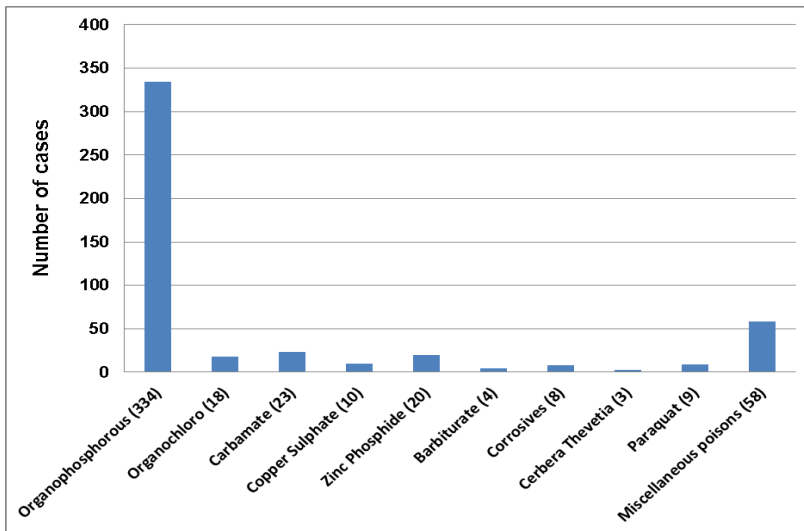
The majority of the decedents used chemical means to kill themselves and accounted for 74.2 % of the total cases, Physical method was used by the remaining victims of FDSH as Depicted in **Fig. No. 07**.

**Figure 07: Methods used for FDSH**



One fourth of the total population studied (25.8 %) opted for FDSH by physical means. Hanging contributing for the maximum number of cases 15.6 %, followed by burns 7.1 %, drowning 2.1 %, fall from height 0.8 %, railway accident 0.5 % and gunshot wound 0.2 % respectively, as depicted in the **Fig. No. 08**.

**Figure 08: Physical methods**



Analysis of the type of poison consumed for FDSH showed that 74 % of the decedents consumed some chemical substance, the most common compound being Organ phosphorous insecticide (50.9%), other poisons and their percentage as depicted in **Fig. No.09**

**Figure 09: Chemical methods adopted**

Present study showed that 20.7 % of the decedents suffered from some kind of chronic physical illness disorders like Chronic Heart Disease (CHD), Diabetes, Renal failure, Bronchial asthma, Tuberculosis and Malignancy that included Carcinoma Breast, endometrial, stomach, lung and appendix. Mental illness included disorders ranging from Mental retardation, schizophrenia, bipolar disorders and depression which accounted for 3.6 % of all the cases and a combination of both was observed in 2.2 % of all the cases under study. There was no history of any illness in 73.5% of all the cases studied during the study period as depicted in **Table No. 02**.

**Table 02: History of illness (n = 656)**

History of illness	Number of cases	Percentage ( % )
Mental illness	23	3.6
Chronic Physical Illness including Malignancy	137	20.7
Combination of both	14	2.2
<b>No history of illness</b>	<b>482</b>	<b>73.5</b>
<b>Total</b>	<b>656</b>	<b>100.0</b>

## DISCUSSION

Fatal deliberate self harm (FDSH) or Suicide in general, across various civilizations, has been considered as a shameful act. Although it is widely encountered, the aetiology and various complexities involved are unfortunately ill-understood. A proper understanding of these aspects is a pre-requisite for suicide investigation.<sup>1</sup>

Suicide receives increasing attention worldwide, with many countries developing national strategies for prevention. Rates of suicide vary greatly between countries, with the greatest burdens in developing countries.

Trends of suicide vary widely according to time, region, age group, sex, and race. Despite mixed trends of increases or decreases in suicide rates around the world, suicide remains an important public-health problem. In an effort to understand and prevent suicide, researchers have investigated medical, psychosocial, cultural, and socio-economic risk factors associated with the environment as a promising line of research.

The present study sample consisted of 656 cases of fatal deliberate self harm (FDSH) out of the 3571 total autopsy cases. The occurrence of FDSH was 18.37% of all the medico-legal autopsies conducted (3571 cases) during the study period (1992-2012). It was 21.2% in another reported work done by Arun<sup>1</sup>

The present study shows that the people of all age groups were involved. The highest incidence was amongst the 21–30 years (35.06 %) followed by 31–40 years (19.35 %). This observation was identical with the available

literatures and studies done by Arun,<sup>1, 2, 3</sup> B. D Gupta,<sup>5</sup> National crime record bureau,<sup>6</sup> Sachidananda.M,<sup>7</sup> Behera,<sup>8</sup> Lisa,<sup>18</sup> B.R. Sharma,<sup>24</sup> Lalwani,<sup>54</sup> Fernando,<sup>59</sup> Gajalaxmi<sup>110</sup>. This is expected, as this age group comprises the majority of the population. Data from the World Health Organisation reports<sup>21</sup> that adolescents and elderly individuals are at a higher risk of committing suicide. Young individuals are prone to being unable to cope with the turbulence occurring in their lives and so opt for deliberate self harm more often.<sup>1, 5, 6, 7, 8, 18, 24, 54, 59, 110.</sup> But in contrast a study in Japan,<sup>7</sup> Mexico<sup>1</sup> and in South Carolina, USA,<sup>38</sup> revealed that the most common age group of the victims was over 65 years.

Male victims predominated and this finding is consistent with the findings as observed by Arun,<sup>1, 2, 3</sup> B. D Gupta,<sup>5</sup> National crime record bureau,<sup>6</sup> Sachidananda.M,<sup>7</sup> Behera,<sup>8</sup> Danielle,<sup>11</sup> Lisa B.R,<sup>18</sup> S. Lalwani,<sup>54</sup> Ravindra Fernando,<sup>59</sup> and Vendhan<sup>110</sup>. Studies in other parts of the world also showed male predominance in suicides like in Cork City, in South Carolina, USA<sup>1, 7, 38</sup> and in Geneva<sup>1, 7</sup>. A study in England and Wales by Kelly and Bunting J<sup>65</sup> suggests that there is an increase in the rate of suicide in both sexes but greater in males. The reasons being that the population of males are higher than that of female's worldwide.<sup>1-3, 5, 6, 7, 11, 18, 54, 59, 110</sup> However a literature search shows that, while men are known usually to commit suicide successfully, women have outnumbered men in non-fatal unsuccessful suicidal attempts.<sup>1, 5, 14, 13, 17.</sup> But in contrast to our observations in China, and in some studies done in India females commit more suicides than males.<sup>24, 38, 60, 64, 63, 75.</sup>

Present study predicts marriage as being one of the important risk factors for suicide. 417 cases out of 656 cases (57.3 %) were married which is almost similar to the findings observed in other parts of India (65 %).<sup>1,5,7</sup> Married people (57.3 %) outnumbered their unmarried counterparts in Fatal deliberate self harm which is consistent with the study done by Arun,<sup>1, 2, 3</sup> Sachidananda.M.<sup>7</sup> The reason for more suicides in married ones may be linked to the two most common causes of suicides (marital disharmony and financial burden).<sup>1</sup> But in Thailand similar incidences of suicides among both married and unmarried have been observed.<sup>7</sup> However, western studies highlight that a high incidence of suicide has been observed among unmarried people.<sup>1</sup> The present study shows that there are probably different factors relating to marital or family life that are operating in the Indian culture. The institutions of 'marriage' and 'family' are given the utmost respect and are followed with great fervour in the Indian tradition, whereas 'live-in' relationships without marriage are more popular in the western world.<sup>1</sup>

Most of the victims belonged to the Hindu religion (86.4 %) followed by Christians (8.4 %) and Muslims (3.7 %) consistent with the studies done by Arun.<sup>1, 2</sup> and Sachidananda.M.<sup>7</sup> In India, a major part of the population follow Hinduism as their religion.<sup>1</sup> Besides some isolated cases of Christians and Muslims, almost all the victims belonged to the Hindu religion. "Upanishads", the Holy scriptures of Hindus had condemned suicide and stated that 'he who takes his own life will enter the sunless areas covered by impenetrable darkness after death'. But the "Vedas" permitted suicide for religious reasons. It viewed that the best sacrifice, that could be made was one's own life.<sup>7</sup>

When we look at the presence of any past illness, 174 cases (26.5%) were having some form of chronic physical and mental disorders at the time of committing suicides most commonly encountered diseases being hypertension, diabetes, malignancies of the lung, breast, stomach and mental illness including schizophrenia, bipolar disorders and depression which was similar to the studies done by A Behera,<sup>8</sup> Danielle,<sup>11</sup> Cavanagh J,<sup>49</sup> Suleyman Goren.<sup>75</sup> But in contrast to our findings some studies have stated that the main risk factor for

both attempted and completed suicide is psychiatric disorder.<sup>22, 16, 46, 48, 49, 50, 75</sup>

Although seasonal variation is not much, however the present study reveals highest number of cases in summer season (36.1%), followed by the winter, the rainy season witnessed the least number of fatalities which is consistent with the studies done by B. D Gupta,<sup>5</sup> Sachidananda.M,<sup>7</sup> Lisa.<sup>18</sup> But contrast to the above finding was observed in Faisalabad, where a seasonal surge was observed in spring.<sup>7</sup> In other studies conducted in India<sup>1</sup> FDSH was seen more during the winter months and in other parts of the world,<sup>18, 37,38</sup> a spring peak for male and spring and autumn peaks for female suicides were found.

Despair with life due to financial restraints and family and marital disharmony constituting 79 % of the total cases was the most common motive for FDSH. Our findings are different from other reported works, which show a high correlation between mental illness and FDSH,<sup>22, 16, 46, 48, 49, 50, 75</sup> but was similar to the studies done by Arun<sup>1, 2</sup>, Lisa<sup>18</sup>, B.R. Sharma<sup>24</sup>. In contrast to the statistics that mental illness is a predominant cause (90 % as per WHO statistics, 51 % as in Singapore and 64.5 % as in Wolver Hampton), we observed only 7.1 % of all suicidal cases had mental illness. The reason may be reluctance by the people of this locality to attend a clinic for simple psychiatric complains consistent with finding of Sachidananda.M.<sup>7</sup> Quite contrast to our findings, studies in South Carolina,<sup>7, 38</sup> USA,<sup>38</sup> and in Japan suggest dreadful diseases followed by problems of economic distress to be the two most common causes of suicide. Dreadful diseases contributed much less towards the causes of suicide in the present study.

74.4 % of the total victims in the present study used chemicals for terminating their lives and only 26.8 % of the study group used physical methods for committing FDSH, which is in accordance with the various study done in India and worldwide by Arun<sup>1, 2, 3</sup>, B.D Gupta<sup>5</sup>, Sachidananda.M<sup>7</sup>, and B.R. Sharma<sup>24</sup>. But in contrast to our study some studies done in India and abroad have shown that the physical methods are most commonly employed method for Fatal deliberate self harm (FDSH).<sup>9, 11, 18, 52, 53, 75.</sup>

Amongst those who opted for physical methods, hanging was the most common (15.6 %) followed by burns (7.1 %). This is in accordance with the findings observed by Arun,<sup>1</sup> Sachidananda.M,<sup>7</sup> Danielle.<sup>11</sup> However, in another study, in Kildare, Ireland,<sup>1</sup> hanging was the commonest method employed and in South Carolina,<sup>102</sup> suicide by gunshot was commonly noted in children under the age of 18 years. Hanging is universally available and it is the most common method of suicide globally.<sup>1, 2, 3, 5, 6, 7, 8, 9, 11, 20, 52, 53, 102.</sup> In many places, the ready access to firearms makes them potentially dangerous, especially among male adolescents and young adults.<sup>18, 75</sup> Death by firearm was the leading method of suicide in a study done in USA,<sup>18, 38</sup> accounting for 67.5 % of all deaths. Regional and state-level analysis (1988–1997) of the United States demonstrated a “robust association” between the rates of household firearm ownership and suicide.<sup>41</sup> Domestic gas has been reported in some studies as a frequently used suicide method.<sup>1, 5, 52, 53, 102.</sup>

Among the poisoning cases, organophosphorus poisoning (51 %) was the most commonly used method for suicide, which is in contrast to the findings observed in England and Wales,<sup>65</sup> wherein vehicle exhaust gas has been commonly used and carbon monoxide poisoning was common in Japan.<sup>7, 9</sup> Finding similar to our study have also been observed in India and in other countries by Arun<sup>1, 2, 3,</sup> Sachidananda.M<sup>7</sup> and Keith Hawton.<sup>38</sup> Miscellaneous poisons included Paraquat, Kerosene, Phosphorus, Chlorpromazine, Glyphosate and Cyanide constituting (4%) of the total cases. People in this region have easy accessibility to organophosphorous insecticides since these are commonly used for agriculture. So whenever there is a tendency to commit suicide, these means are readily available.<sup>1, 2, 3, 5, 7, 8, 20, 102.</sup>

## CONCLUSION

- The incidence of Fatal Deliberate Self Harm (FDSH) was more in the age group of 21-30 years (35.06 %) and lowest in the age group of less than 10 yrs (0.45 %).
- Males outnumbered females in our study (66.5 %). The male female ratio was 2:1.
- Majority of the suicide victims were married (57.3 %).

- Majority of the victims of Fatal Deliberate Self Harm (FDSH) belonged to the Hindu religion (86.95 %).
- 75 % of the decedents of Fatal Deliberate Self Harm (FDSH) didn't have any history of illness.
- 25% of the victims of Fatal Deliberate Self Harm (FDSH) had a history of Physical illness and mental illness ranging from hypertension, diabetes, carcinoma to schizophrenia and depression.
- The most favored season for Fatal Deliberate Self Harm (FDSH) was summer, constituting 36.1% of the total cases analysed.
- Despair with life along with financial constraints (79.0 %) was the most common motive for the victims of Fatal Deliberate Self Harm (FDSH).
- The most common method used for Fatal Deliberate Self Harm (FDSH) was chemical method constituting 74.2 % of the total cases.
- The most common physical method adopted was hanging constituting 15.6% of the total number of cases.
- The most common poison consumed was Organ phosphorus insecticide (51%).

The finding of our study is in accordance with various workers not only in India but studies done worldwide.<sup>1, 2, 3, 5, 7, 8, 9, 10, 11</sup>

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