A study of the clinical, socioeconomic and psychological impact of deliberate self-harm by poisoning in patients presenting to a tertiary care center in South India

A dissertation submitted in partial fulfilment of the rules and regulations for MD General Medicine examination of the Tamil Nadu Dr. M.G.R Medical University, Chennai, to be held in May 2018

DECLARATION CERTIFICATE

This is to certify that the dissertation titled "A study of the clinical, socioeconomic and psychological impact of deliberate self-harm by poisoning in patients presenting to a tertiary care center in South India" which is submitted by me in partial fulfilment towards M.D Branch I (General Medicine) Examination of the Dr. M.G.R. University, Chennai to be held in May 2018, comprises my original work and due acknowledgement has been made in text to all materials used.

Josh Thomas Georgy

PG Registrar,

Department of General Medicine,

Christian Medical College,

Vellore- 632004,

India.

CERTIFICATE

This is to certify that the dissertation "A study of the clinical, socioeconomic and psychological impact of deliberate self-harm by poisoning in patients presenting to a tertiary care center in South India" is a bonafide work of Dr. Josh Thomas Georgy carried out under our guidance towards the M.D. Branch I (General Medicine) Examination of the Tamil Nadu Dr. M.G.R. University, Chennai to be held in May 2018.

GUIDE

Dr. Anand Zachariah

Professor,

Department of General Medicine Unit I,

Christian Medical College,

Vellore- 632004,

India.

HEAD OF DEPARTMENT

Dr. O C Abraham

Professor and Head of Department,

Department of General Medicine,

Christian Medical College,

Vellore- 632004,

India.

PRINCIPAL

Dr. Anna B Pulimood

Professor,

Department of Pathology,

Christian Medical College,

Vellore- 632004,

India.

PLAGIARISM CERTIFICATE

INTRODUCTION The incidence of deliberate self-harm is higher in South India, especially in the Kaniyambadi block, as compared to the rest of the world. Around 800000 people died from deliberate self-harm worldwide in the year 2012 according the WHO. The lifetime prevalence of suicide ranges from 0.72 to 5.93 per 100 across the world. In the year 2010, 187000 deaths as a result of deliberate self-harm were recorded in India. Various studies have shown the prevalence of suicide to vary from 3% to 11 % across the country. It has been shown to be higher in the South. Few studies world over have looked at the long term outcome of patients following deliberate self-harm in terms of their social outcome and quality of life with respect to their mental health and long term effects of the poison. However, there are no similar studies from India following up these patients to understand the clinical, economic, social and psychological impact the episode has had on them. This study aims to assess the outcome of the patients with respect to general health, long term effects of the poisoning if any, employment, marriage, education, stressor at initial attempt, financial situation including debts, substance or alcohol abuse, depression, health seeking behaviour. We followed up patients who had been admitted with a diagnosis of deliberate self-harm by poisoning between 2009 and 2014 in order to assess their outcomes. This study was designed to assess the positive or negative impact of the deliberate self-harm episode on the patients in order to help with future follow up and care of patients.

AIM To study the clinical, socioeconomic and psychological impact of deliberate self-harm by poisoning in patients who present to CMC Vellore.

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Dr. Anand Zachariah

Professor,

Department of General Medicine Unit I,

Christian Medical College,

Vellore.

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INTRODUCTION

The incidence of deliberate self-harm is higher in South India, especially in the Kaniyambadi block, as compared to the rest of the world. Around 800000 people died from deliberate self-harm worldwide in the year 2012 according the WHO. The lifetime prevalence of suicide ranges from 0.72 to 5.93 per 100 across the world. In the year 2010, 187000 deaths as a result of deliberate self-harm were recorded in India. Various studies have shown the prevalence of suicide to vary from 3% to 11 % across the country. It has been shown to be higher in the South. Few studies world over have looked at the long term outcome of patients following deliberate self-harm in terms of their social outcome and quality of life with respect to their mental health and long term effects of the poison. However, there are no similar studies from India following up these patients to understand the clinical, economic, social and psychological impact the episode has had on them. This study aims to assess the outcome of the patients with respect to general health, long term effects of the poisoning if any, employment, marriage, education, stressor at initial attempt, financial situation including debts, substance or alcohol abuse, depression, health seeking behaviour. We followed up patients who had been admitted with a diagnosis of deliberate self-harm by poisoning between 2009 and 2014 in order to assess their outcomes. This study was designed to assess the positive or negative impact of the deliberate self-harm episode on the patients in order to help with future follow up and care of patients.

AIM

To study the clinical, socioeconomic and psychological impact of deliberate self-harm by poisoning in patients who present to CMC Vellore.

OBJECTIVES

To determine the outcome of deliberate self-harm among patients who present with poisoning to CMC Vellore in terms of the following:

1. Effects on physical health including long term effects of the poisoning, both direct and indirect, new health issues and health seeking behaviour
2. Employment, marriage, education, stressor at initial attempt, financial situation including debts
3. Substance or alcohol abuse and depression.

REVIEW OF LITERATURE

INTRODUCTION

Deliberate self-harm is the term used to describe a set of heterogeneous thoughts and behaviours in an attempt to end life or as a cry for help.(1) The common methods include hanging, poisoning, and self-mutilation. These are usually done due to the person's inability to cope with stress or strain he/she is undergoing or as a result of an underlying psychiatric disorder. Deliberate self-harm is fairly common in clinical practice and more so in South India as compared to the rest of the world. These patients are usually managed in the acute setting by the internist and followed up by the psychiatrist. However, a long term clinical follow up in order to assess their outcomes with respect to health, social and economic status is sorely lacking. Many of these patients attempt self-harm out of an impulsive thought and in retrospect do not wish to die. However, they might have problems integrating into society even though they do not have any health problems following the attempt. Regardless of the intentionality these patients pose a burden on the healthcare system and on their social support systems. It would be encouraging to know if most of them have a good outcome in the long term.

EPIDEMIOLOGY OF DELIBERATE SELF-HARM

Worldwide

In 2012 based on a WHO report, an estimated 803,893 people died from suicide worldwide. The yearly mortality rate was 11.4 per 100, 000. Suicide accounted for 1.4% of all deaths

and was the 15th leading cause of death worldwide in 2012.(2) Suicide was the cause of 16% of all injury related deaths worldwide. In the 15-29 age group, suicide was the second leading cause of death following road traffic accidents in 2012 and 2015.(3) Suicide rates are lowest in the age group below 15 years of age and highest in those aged 70 and above. A large WHO study the highest rates were found in the 25 to 34 age group.(4) The lifetime prevalence rates/100 for suicide ideation ranged from 2.09 (Beirut) to 18.51 (Christchurch, New Zealand) and for suicide attempts ranged from 0.72 (Beirut) to 5.93 (Puerto Rico).(5) In a study among adolescent children in 41 schools in England 784 of 5923 (13.2%) pupils reported lifetime history of deliberate self-harm. Deliberate self-harm in the previous year was reported by 509 (8.6%) pupils.(6) In an 8-year study from 2000 to 2007 in 3 centres in England, there were 51,206 episodes of self-harm by 31,278 people. These non-fatal self-harm attempts involved poisoning, hanging, jumping and traffic related injuries.(7) The frequency of suicide attempts range from can be 10 to 40 times higher than that of completed suicide.

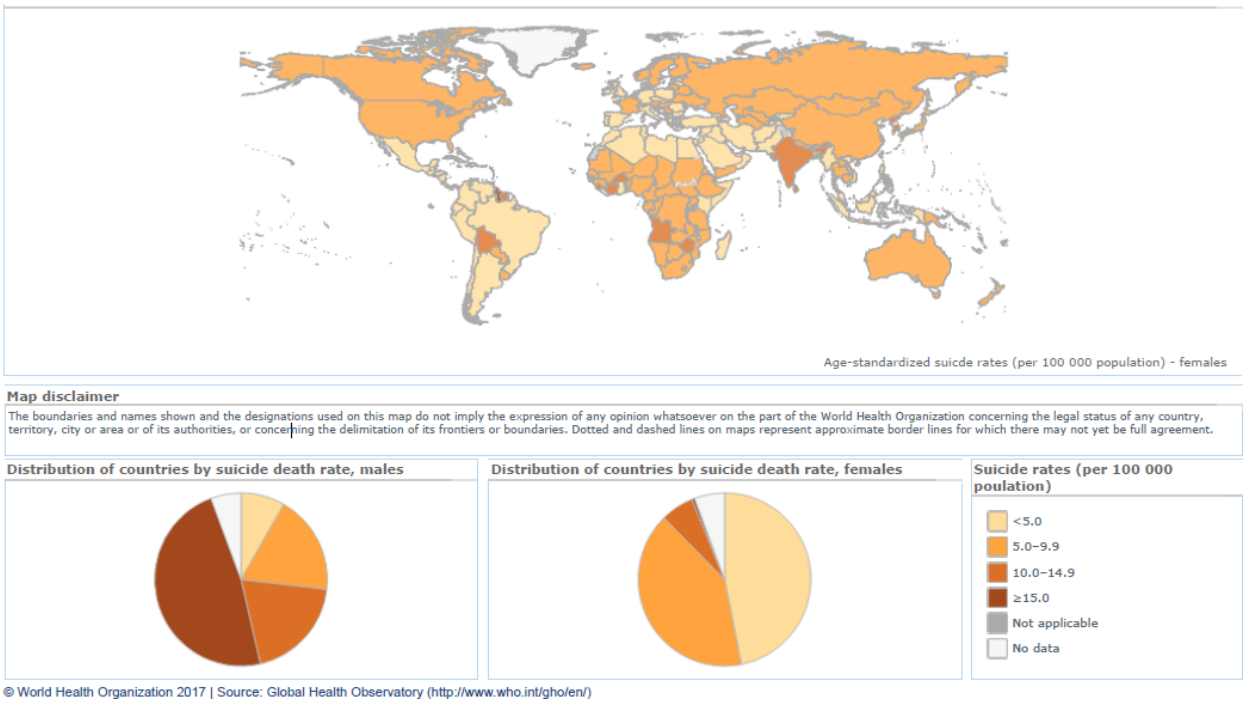


Figure 1 Suicides rates worldwide (Females)

Previously it was thought that the rates of self-harm among men was 3 times higher as compared to women. However, this was skewed data mainly from high income countries alone. Some studies have shown a preponderance of females attempting self-harm. In the CASE study, among an international population of adolescents, 8.9% of females and 2.6% of males reported an episode of self-harm in the year prior to the study, and 13.5% females and 4.3% males reported an attempt at some point in life.(8) However this pattern is not consistent across other populations. Sex ratios in low and middle-income countries can be as low as 0.9 in the Western Pacific to 4.1 in Europe. The average male-to-female sex ratio is 3.2.(2) The 2012 WHO data regarding suicide rates was available from 172 countries, out of which only 60 have high quality data which can be used to estimate the incidence.(2) Worldwide many countries still continue to criminalize suicide attempts. Decriminalization has been shown to decreased suicide incidence contrary to the belief that it will increase it.

Various methods are used for deliberate self-harm with large variations between countries. As far as poisoning is concerned China, India and other Asian countries see a large number of pesticide poisoning. In contrast Western nations have a higher proportion of prescription medicine overdose. From 1993-2008 among all cases of suicide presenting to the emergency departments across the United States of America, the commonest method of self-harm was by poisoning(67%).(9) The National Poison Data System repository of the United States recorded 1,708,788 cases of suspected suicide by poisoning from January 2000 to December 2008. Of these, the commonest was benzodiazepine overdose followed by ethanol.(10) The largest representation was from the 13 to 19 age group. A retrospective analysis from Iran between 1993 and 2013, reported 6794 cases of suicide due to poisoning. The commonest method was prescription tablet overdose and the lowest was narcotic substance. (11) In the United Kingdom 87.9% of self-cases involves poisoning, 8.3% injury and 3.8% both of these.(12) In China and Jaffna, Sri Lanka pesticides were the commonest method of self-harm. However in Australia, England and Wales hanging was the commonest method.(13)

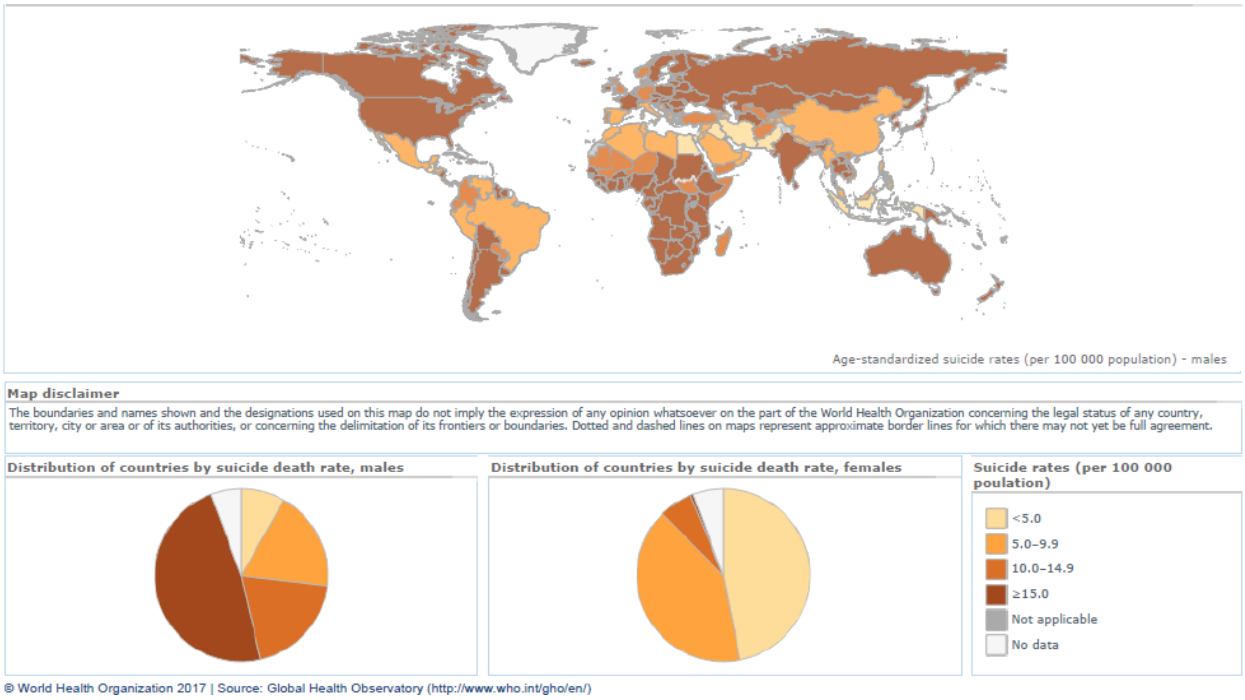


Figure 2 Suicides rates worldwide (Males)

India

The nationally representative mortality survey (NRMS) was conducted by the Registrar General of India between 2001 and 2003 in 1·1 million homes in 6671 regions across India. Fieldworkers collected data on the mode of death and risk factors for self-harm. This data was then extrapolated to the whole of India by Patel et al in 2012 using the 2010 UN estimates of absolute numbers of deaths in India to estimate the number of suicide deaths in India in 2010. They reported that about 3% of deaths at ages 15 years and older (2684/95,335) were due to suicide. They estimated 187000 deaths due to suicide in India in 2010.(14)

The National Crime Records Bureau (NCRB) reports official suicide rates in India. This is the only systematic data available in India on suicide rates. However, compared to

independent reviews, other epidemiological studies underreporting of suicides was evident till recently, probably because suicide was punishable by law till recently. Hence it is important to look at other regional sources of information too in order to get an overall idea of the incidence of suicide. In 2015 according to the NCRB report "Accidental Deaths & Suicides in India 2015" 133623 suicides were reported all over the country. This translated to a rate of 10.6 per 10 lakh mid-year projected population.(15)

Year	Total no. of suicides	Mid-year projected population(Lakhs)	Rate of suicide (per one lakh population)
2013	134799	12287.9	11
2014	131666	12440.4	10.6
2015	133623	12591.1	10.6

Table 1 Data according to the Accidental Deaths & Suicides in India 2015 (NCRB)

However according to data from the nationally representative mortality survey (NRMS) conducted by the Registrar General of India, there could be underestimation of at least 25% in men and 36% in women.(16) From 2004 to 2013 deaths from suicides have occurred most in 15 to 29 years ages in women and 30 to 44 years ages in men. The average male to female ratio is 1.8 to 2.1. In men it is financial and social reason which drive them to attempt self-harm, whereas in women it was emotional and personal causes. This is in stark contrast to developed countries depression, ethanol abuse and other psychiatric illnesses account for a large number of suicides. The NCRB has reported the state wise distribution of suicides each year. For the year 2015, Maharashtra saw the largest number of suicides

at 16,970 followed closely by Tamil Nadu at 15777 and West Bengal at 14602. These states accounted for 12.7%, 11.8% and 10.9% of total suicides respectively.

Rank	2015
1	Maharashtra 12.7%
2	Tamil Nadu 11.8%
3	West Bengal 10.9%
4	Karnataka 8.1%
5	Madhya Pradesh 7.7%

Table 2 Percentage share of states with top suicide rate 2015(NCRB)

According to the NCRB data "family problems" and "illness" were cited to be the commonest causes of suicide. The other issues included Marriage problems, bankruptcy, love failure, drug and ethanol abuse, failure in academics, unemployment and property disputes.(15)

Multiple other studies also provide data on suicide rates in India.

In South India multiple studies have been done in the Kaniyambadi block in Tamil Nadu, among a population of 108,000. A computerized health information system has been in operation since 1986 in this block which prospectively records all information on births and deaths within the community. The mortality information was based on the use of the verbal autopsy method. Aaron et al in 2004 analysed the mortality rates from 1992 to 2001, among 10 to 19 years age group. Nearly 25% of all deaths in young men and 50-75% of all deaths in young women were due to suicide. They reported that the average suicide rate

among young women was 148 per 100,000, and for young men 58 per 100,000.(17) Bose et al analysed mortality rates prospectively in the Kaniyambadi block from 1998 to 2004, and found that suicide constituted 11.3% of all deaths across all age groups. The average rate for suicides was 82.2 per 100 000 population.(18) In 2009 the same group found that the overall suicide rate in the 2 years between January 2006 and December 2007 was 120.3 per 100,000 population. It was higher in men (130.9 / 100,000) than in women (109.7 / 100,000).(19)

In North India Mohanty et al retrospectively analysed medico-legal post-mortems over a period of 4 years from 2000 to 2003 done at a medical college in Berhampur, Odisha. A total of 588 suicidal deaths were recorded among a total of 2096 medico-legal post-mortems. The suicidal death rate was 11.76 per 100,000 population.(20) In Nagpur, Maharashtra, a retrospective study from January 2009 to December 2013 by Badiye et al. reported a total of 2306 suicides in the time period with the maximum number being from 2013 at 523 cases. The average male to female ratio was 2.5:1.(21) In North-East India Singh et al reported high rates of self-harm in an isolated tribal population, the Idu Mishmi. The rate of suicide was 14.22%, which was much higher compared to the general (0.4–4.2%).(22)

As can been seen from the above examples the epidemiology of deliberate self-harm varies from region to region and from state to state in India as can be expected in such a vast country. The data regarding self-harm is also incomplete at best and needs a more robust system in place so that no cases are missed out. Since the recent decriminalization of

suicide in India it should become easier to collect data as patients might be more forthcoming about the same. It is also important to note the recent increased incidence of suicide among farmers owing to financial difficulties brought about by droughts, climate change and crop failure. The Times of India reported that the maximum number of farmer suicides were in Maharashtra. January to June of 2015, 1300 farmers committed suicide, much higher than the previous years.(23)

METHODS OF DELIBERATE SELF-HARM

Global data

Methods of self-harm vary from highly lethal methods like hanging, self-poisoning, shooting oneself, jumping from a high place to the non-lethal ones like self-hitting, cutting and pinching.(1) The methods vary between countries, communities, age groups and genders. As most suicides are impulsive responses to stressful life situations, if access to the method of suicide is restricted, there is a chance that the person might reconsider his/her decision. Various ways to restrict means of suicide have been attempted including restricting access to firearms, pesticides; physical barriers on high-rise buildings, bridges and known points of suicide; regulations on drug labels/covers.(2) Hence it is important to determine the common methods to find means to restrict easy access to these means. According to a WHO report, national level data is insufficient from most countries. From 2005 to 2011 only 76 of 194 countries collected data on suicide methods. As these countries account for only 28% of suicides, the methods used in the remaining large chunk of nearly three-fourths is unknown. In high-income nations, the commonest method of self-harm is

hanging (50%), followed by firearms (18%).(2) In low income countries especially with a large population involved in agriculture, pesticide poisoning is the commonest method. A 1985 editorial in the British Journal of Industrial Medicine extrapolated data from Sri Lankan studies and estimated that roughly 2.9 million cases of pesticide poisoning presented to hospitals worldwide of which 220,000 resulted in mortality.(24) A systematic review of pesticide poisoning Gunnell et al in 2007 reported that there were 258,234 (233,997 to 325,907) suicides by pesticide self-poisoning yearly all over the world. This would account for nearly 30% of all deliberate self-harm globally. They also found that the use of pesticides for self-harm varies from 4% in Europe to 50% in the Western Pacific.(25) In urban areas especially in countries like China and Singapore, where most people live in apartments housed in skyscrapers, jumping to death from the top of such buildings is a common method of suicide. Some recent methods like the one in Japan where gaseous hydrogen sulphide is produced by mixing chemicals show that constant monitoring is required to identify methods and means and to educate the community regarding these risks.(2) A 5 year multicentre cohort study that looked at 33000 consecutive deliberate self-harm cases looked at the method used at an index attempt and at repeat attempts. The method at initial attempt was self-poisoning in 78% (3696/4709), cutting in 15% (689), combined injury and poisoning in 4.6% (215), severe injury in 1.4% (66) and other non-severe injury in 0.9% (43) of the cases.(26) The same group reported data regarding methods of suicide in those who died in another study. They found that 35.9% cases were by self-poisoning of which antidepressants and tranquilizers were the commonest followed by analgesics, Carbon monoxide and other gases and other substances. 64.1% of cases were

by self-injury of which hanging/suffocation was the commonest, followed by jumping from a height, drowning, lying before a moving object, firearms and by sharp object.(27)

In 2008, the WHO brought out a bulletin outlining the methods of suicide world over derived from the mortality database. Overall the commonest method was hanging. However, the methods varied widely from the predominant pattern. Firearms were the commonest mode in the United States of America. It was also common in Argentina, Switzerland and Uruguay. Jumping from a height, as mentioned earlier, was common in urbanized settings like Hong Kong, Luxembourg and Malta. In rural populations of Latin America, Asia and in Portugal, pesticides was a predominant method. Poisoning with other drugs was seen at a higher rate in women from Canada, the Nordic countries and the United Kingdom.(28)

Country	Years	Other poisoning	Pesticides	Hanging	Drowning	Firearms	Falls	Other	Number
South Africa	1996, 2004	6.6	3.6	68.7	0	12.6	0.2	8.2	412
Brazil	1996–2002	2	8.3	52.4	0.9	22.1	1.8	12.6	33072
Mexico	1998–2003	0.9	5.3	68.8	0.5	20.5	0.7	3.3	18283
Canada	2000–2003	10.2	0.4	44.4	2.3	21.6	4.7	16.3	11419
USA	1999–2002	7.1	0.3	20.4	0.9	60.6	1.9	8.8	97014
Japan	1995–2004	1.3	2.5	68.7	2.6	0.2	8.1	16.5	199505
Republic of Korea	1995–2004	0.4	37.5	39.2	3.2	0.4	9.5	9.8	53449
Australia	1998–2003	8	1.1	45.4	1.3	11.5	3.6	29.1	11422
Czech Republic	1994–2004	5	0.6	63.8	1	12.4	6.5	10.8	14154
Germany	1998–2004	8	1.3	55.5	2.1	10.3	7.4	15.5	57202
United Kingdom	2001–2004	14.7	0.4	55.2	2.4	3.5	2.9	20.8	12573

Table 3 Percentage of methods in major countries – Men

Indian data

In Nagpur, Maharashtra Badiye et al reported that the commonest method was hanging among both males (54.77%) and females (47.65%). Among males this was followed by insecticide poisoning (16.52%), drowning (16.33%), self-immolation (6.8%) and other methods. In females self-immolation (26%), insecticide poisoning (15%) and drowning were the common methods.(21)

In the 4 year retrospective analysis, Mohanty et al reported that hanging (32.6%) was the commonest method followed by poisoning (30.6%), Self-immolation (18.3%), railway run-over (17%) and drowning (1.3%).(20)

Country	Years	Other poisoning	Pesticides	Hanging	Drowning	Firearms	Falls	Other	N
South Africa	1996, 2004	22.7	12.6	41.2	0.8	9.2	0.8	12.6	119
Brazil	1996–2002	6.5	16	37.6	2.3	13.4	3.9	20.4	8591
Mexico	1998–2003	6.9	21.5	51.3	0.7	13.4	1.5	4.7	3590
Canada	2000–2003	34.3	5	36.8	4	3.8	6.5	14.1	3288
USA	1999–2002	31	0.5	16.9	2.1	35.7	3.4	10.5	23629
Japan	1995–2004	2.9	4.3	59.9	7.8	0	12.5	12.7	82646
Republic of Korea	1995–2004	0.8	42.8	26	3.8	0.1	18.5	8.1	23392
Australia	1998–2003	26.5	0.7	36.4	3.9	2.6	4.6	25.3	3017
Czech Republic	1994–2004	18.2	1.3	44.8	4.8	2.6	15.7	12.5	4016
Germany	1998–2004	22	2	38.9	7.2	1.4	14.1	14.4	20870
United Kingdom	2001–2004	41.1	0.3	35.9	4.7	0.6	3.7	13.9	3832

Table 4 Methods by percentage in major countries – Women (Methods of suicide: international suicide patterns derived from the WHO mortality database)

The most frequent methods used for deliberate self-harm in South India are hanging and poisoning. In the study by Bose et al in 2009, the commonest method among those who died was hanging (75.7%) and among those who survived the attempt poisoning (58.2%). Overall poisoning was the commonest (43.7%).(19) Among poisons, pesticides followed by poisonous plants were the ones most frequently used. In the study by Gajalakshmi and Peto, self-poisoning followed by hanging and self-immolation were the most common methods used.(29) According to the NCRB the commonest method was hanging (45.6%) followed by poisoning (27.9%), self-Immolation (7.2%) and drowning (5.4%) all over the country.(15)

No.	Method	Percentage, number
1	Hanging	45.6%(60,952)
2	**Poisoning**	**27.9%(37,232)**
3	Fire/Self-Immolation	7.2%(9,558)
4	Drowning	5.4%(7,267)
5	Moving Vehicles/ Trains	2.5%(3,338)
6	Jumping from height	1.8%(2,382)
7	Touching Electric fence	0.7%(954)
8	Sleeping Pills	0.5%(645)
9	Self-inflicting Injury	0.4%(572)
10	Firearms	0.4%(469)

Table 5 Common methods by percentage NCRB data

POISONING IN INDIA

As seen in the above table the use of firearms is very minimal in India as expected due to the limited availability of the same. Poisoning is the second commonest method of suicide in India exceeded only by hanging. Consumption of sleeping pills and other prescription tablets is lower down on the list. This points to the use of pesticides and plant poisons in the predominantly agriculture-based and rural communities of India.

As mentioned above, pesticides are the commonest method used for deliberate self-harm across India. However, there are region-specific plant poisons and differences in the chemicals and classes of compounds used in various parts of the country. In a study of 225 patients who presented with poisoning to a tertiary hospital in rural South India in 2003, organophosphorus, organochloride compounds were the commonest (60%). This was followed by aluminium and zinc phosphide (22%). Phenobarbitone, benzodiazepines and paracetamol poisoning constituted less than 10% each. Other drugs were antihistaminic agents, anti-inflammatory and analgesics which accounted for 6% together.(30) In another study from Mangalore from 2001 to 2003, a total of 325 cases of acute poisoning were analysed. The commonest agrochemical poisons were organophosphates (66.9%), aluminium phosphide (12.7%), organochlorine (8.3%), rat poisons (5.1%), carbamates (5.1%) and pyrethroids (2.5%). Prescription drugs contributed 16.6%, acids 4.6%, plant poisons 3.7%, kerosene 2.8% and copper sulphate 3.7%.(31) In a 5 year study of 1860 cases of poisoning presenting to secondary hospital in a rural area in Tamil Nadu, Organophosphates constituted 461 cases (24. 78%). The other poisons were paraquat, 211

cases (11.34%), rat poisons, 158 cases (8.49%), cow dung dye, 173 cases (9.30%), Pyrethroids, 167 cases (8.98%), prescription tablets, 125 cases (6.72%) and household cleaning liquids, 93 cases (5.00%).(32) The other common poisons in South India include oduvanthalai (cleistanthus collinus), yellow oleander, formic acid and hair dyes (supervasmol). The clinical features of a few of these poisons are worth mentioning as some are unique or relatively new to these parts.

Oduvathalai (cleistanthus collinus) poisoning

Cleistanthus collinus is a toxic shrub, the fruits, roots and leaves of which are used almost exclusively by people in South India for deliberate self-harm. The toxic constituents of the shrub are Diphyllin, Cleistanthin A and Cleistanthin B which are cardiac glycosides.(33) The toxic effects include the following:

Distal RTA- hyperchloremic metabolic acidosis; hypokalemia
QT prolongation, cardiac arrhythmias
Type 1 RF with ARDS
Refractory hypotension
Neuromuscular weakness

Table 6 Manifestations of Oduvanthalai poisoning

In a study of 51 patients presenting to a tertiary medical center, hypokalemia, elevated WBC count and neutrophilia were independently associated with mortality.(34) The management of Oduvanthalai poisoning involves correction of hypokalemia and acidosis,

monitoring for cardiac arrhythmias, ARDS and hypotension. There is no specific antidote for the poison.

Supervasmol (hair dye) poisoning

This is a relatively inexpensive hair dye which is available freely. The main toxic constituent of this dye is paraphenylene diamine. A retrospective study done in our institution from 2006 to 2009 studied 13 patients who had consumed the dye for deliberate self-harm.(35) The patient were predominantly women (84%), mostly housewives. The commonest symptoms at presentation were throat pain, hoarseness of voice, nausea and vomiting, decreased urine output, cervico-facial edema and breathlessness. It also results in rhabdomyolysis and acute kidney injury due to acute tubular necrosis. The severe cervicofacial edema can cause airway tract obstruction and may require emergency tracheostomy. IV corticosteroids and antihistamines, aggressive hydration with forced diuresis, diuresis and correction of dyselectrolytemia are the main stay of management. However, there is no specific antidote for the poison and good supportive care is essential for good outcomes.

PSYCHOSOCIAL AND ECONOMIC OUTCOMES OF DELIBERATE SELF-HARM

Employment, relationship status and life satisfaction

The outcome of deliberate self-harm with respect to social factors has been followed up in very few studies. The impact of deliberate self-harm on the patient's social life,

relationships, occupation, mental health In a study by Morgan et al in 1972, 279 patients were followed up after a period of 1 to 2 years to assess the social outcomes and repeat attempts at deliberate self-harm.(36) Out of 155 patients who were asked to review in the psychiatry OPD following discharge, only 110 returned among whom only 68 were on regular follow up and completed the course of treatment. The percentage of employed women had risen from 38 per cent before suicide attempt to 52 per cent when they were reviewed between 1 to 2 years later. The unemployment rate among men which had already been high at the first assessment during the initial episode, remained high at 40 percent. There was not much change in the financial situation with 37 per cent having major financial problems and 27 per cent having minor ones. Health seeking behaviour had changed following the self-harm episode. Prior to the episode 40 percent of people had visited a doctor for physical ailments, however following the self-harm, 57 per cent of people had sought treatment for illnesses. Whether this was a direct physical effect of self-harm or just a change in behaviour is unclear. A total of 142 people had no change in their marital situation. Among the rest, 13 people got married, 29 started cohabiting, 29 re-joined their spouse, 12 re-joined cohabitee, 15 people got divorced, 41 separated from their spouse, 30 separated from cohabitee, 1 person became widowed and 5 changed cohabitee. 106 (nearly 40 %) patients had a change in their marital status. They also found that the antecedent causes of deliberate self-harm included interpersonal problems such as marital issues, conflicts, social issues such as lack of support, economic and environmental problems. These factors were persistent and underwent significant changes for the worse during the follow-up period.

Nordentof et al studied a cohort of 974 patients with deliberate self-harm by poisoning, from 1980 to 1990.(37) In the year 1980 1105 patients were admitted with self-poisoning. Among these patient's, 14 died in hospital, 96 cases of accidental poisoning, and 25 were lost to follow up as they had relocated themselves. At the end of the follow up period, 306 patients had died. Of these patients, 103 had repeated deliberate self-harm, 131 died from natural causes, 31 died by accidents, 5 were murdered, and in 36 cases the cause of death was uncertain. At the time of initial attempt, 23% of men and 15% of women were living alone; only 33% men and 32% women were employed. Among those who repeated deliberate self-harm, the commonest methods were poisoning (56/103), hanging (22/103), domestic gas or car exhaust (5/103), firearms (5/103) and drowning (4/103). The most startling finding was the high rate of death both from natural as well as unnatural causes as compared to the general population. The cause-specific mortality was 60 times and mortality from suicide was 30 times higher than in the general population. The reason behind this high mortality as compared to the general population might lie in the psychosocial, clinical and economic impact of the deliberate self-harm itself or the factors that led to the suicide attempt in the first place.

In a nationwide analysis conducted in Finland, a cohort of 29173 people were studied with respect to whether self-reported life satisfaction predicted suicide.(38) They were studied over a period of 20 years from 1976 to 1995. They were unselected for mental health status. Average age of men was 33.5 years and of women was 34.0 years. At baseline evaluation, better life satisfaction scores were seen in subjects who were women, otherwise healthy,

married, those who led an active lifestyle, those who did not smoke, younger people (<45 years), and those in the higher classes of society. There was a significant association between life satisfaction and suicide. Those who had lower life satisfaction were more likely to commit suicide (31.87%) than those who were more satisfied in life (18.10%). Those who committed suicide were also more likely be living alone and not with a close relative (52.20% vs. 42.20%), be heavy consumers of alcohol (22.53% versus 7.40%) smoke more (19.23% versus 9.00%), and have health related problems more often (31.32% versus 22.90%). There was a J-shaped curve showing the association between alcohol intake and life satisfaction. They found that a higher level of satisfaction in people who consumed low amounts of alcohol as compared to heavy drinkers and those who were totally abstinent. The cumulative incidence of deliberate self-harm in the twenty-year follow-up time period was 1.04% for men and 0.22% for women. The suicide rates were 56.9 per 100,000 person years for men and 11.8 per 100,000 person years for women. This study has looked at whether the baseline social factors and overall life satisfaction scores help predict suicide and have found a significant association between them as was expected.

Grimholt et al studies the effect of systematic follow-up by physicians on suicidal ideation, depression and hopelessness as compared to baseline.(39) A total of 202 patients were randomised into two arms of 101 each, one group receiving the intervention of physician follow-up and the control group without the same. The mean age was between 35 to 40 years. 30% of the intervention group and 34% of the control group were married, 4% and

11% of the respective groups were separated or divorced at baseline. 9% of the intervention group and 11% of the control group were unemployed. 55% of the intervention group and 76% of the control group were willing to seek help to solve the stressors which led them to the self-harm episode. There was no statistically significant difference in the following scores between the two groups at the end of the follow up period of 6 months: Beck Suicide Ideation Scale, Beck Depression Inventory, and Beck Hopelessness Scale.

There is a sparsity of studies that have followed up patients to assess their economic and social outcomes.

The rates of repeat Deliberate self-harm vary among studies from 12-40%. Hawton et al reported in their study in 1999 that 40 % had either a previous history of deliberate self-harm and/or a repeat episode by the end of the year following entry to the study. There was a significant association between the depression and hopelessness indices and repetition of suicide.(40) Zahl and Hawton found that 2.6% of patients repeated the deliberate self-harm by the end of their study period. The risk of suicide was 66 times greater in that of the general population in the first year of follow up.(41)

Author	Year	Percentage; N	Remarks
Morgan et al	1976	24%; 279	1-2 year follow up
Nordentof et al	1993	10.5% ; 974	10 year follow up
Hawton et al	1999	40%; 45	1 year follow up
Hall et al	1998	31.6%; 8304	13 year follow up
Vajda et al	2000	39%; 112	1 year follow up
Owens et al	2002	15%; -	1-10 years of follow up
Zahl, Hawton et al	2003	2.6%; 11583	10.8 years follow up
Suominen et al	2004	13%; 98	37 years Meta-analysis
Cooper et al	2005	0.7%; 7968	4 years follow up
Chung et al	2012	8.5%; 39875	1-8 years follow up
Carroll et al	2014	22.4%; -	5 years Meta-analysis
Kwok et al	2014	9.%; 7601	1 year follow up
Hawton, Bergen et al	2015	1.6%; 2704	12 year follow up

Table 7 Few major studies showing the rates of repeat deliberate self-harm

Skegg in a meta-analysis found the following as risk factors for repeat deliberate self-harm: Older age, male sex, past psychiatric care, psychiatric disorder, social isolation, repeated self-harm, avoiding discovery at time of self-harm, medically severe self-harm, strong suicidal intent, substance misuse, hopelessness and poor physical health. (1) In the South Indian population, however, most of the deliberate self-harm is impulsive, not well-planned and are unlikely to be repeated, hence the rates are thought to be low. A meta-analysis by Carroll et al in 2014 looked at 177 studies of repetition of deliberate self-harm published within the time period 2000 to 2012. The median sample size of these studies was 394 and follow-up of 2 years. The range of sample size was from 50 to 50891. The commonest method was poisoning. The incidence of repeat self-harm was 16.3% in the first year,

16.8% at the end of the second year and 22.4% at the end of five years.(42) They used random effects meta-analysis to estimate these rates.

The immediate outcome of 1348 patients with respect to the psychiatric history, previous attempts, sex, age, mode of presentation and physical severity of the deliberate self-harm attempt was studied by Kudo et al in 2010.(43) The categorized the patients into three groups- those who were admitted in the ICU, those who were admitted in the wards and those who were treated as outpatients. Men were more likely to use more severe methods of self-harm and were more likely to take it to completion. The percentage of men was significantly higher in the ICU group. They found that the patients with psychiatric disorders in the ICD F2 classification (schizotypal and delusional disorders) were more likely to be hospitalized. Even when schizophrenic patients exhibited suicidal tendencies prior to the episode, they were mostly brushed aside as part of the disease process. In the ICD F3 group of patients (mood disorders), more severe methods of self-harm were prevalent. The ICD F4 group with neurotic, stress-related and somatoform disorders were more likely to be in the non-hospitalized group. The ICD F3 (mood disorders) group of patients were more likely to be in intensive care. Extrapolating this data, the outcomes following discharge can be considered similar to the immediate outcome. The groups who did better were more likely to be in the ward or outpatient groups. The patients who required critical care were likely to fare much worse compared to the others. Their baseline psychiatric illness would have placed them at increased for further episodes of deliberate self-harm.

ALCOHOL, DRUG ABUSE AND DELIBERATE SELF-HARM

Alcohol dependence is a known risk factor for deliberate self-harm. A meta-analysis by Wilcox et al in 2004 found that those who had alcohol use disorders were at 9.79 times risk of self-harm than the general population.(44) They analysed 33 studies from around the world. In their study the population with opioid abuse had a 13.51 higher risk for deliberate self-harm compared to the general population. There are multiple studies showing heightened risk of suicidal behaviour and ideation with alcohol dependence. A nationally representative study from the United States of America found increased incidence of violent behaviours, both self-directed and other-directed among those with nicotine, alcohol, marijuana, and pain reliever use disorders.(45) A study by Sharma et al in 30 patients with alcohol dependence found that 80% of them had attempted self-harm in an inebriated state.(46) Ziółkowski et al identified that alcohol dependence and alcohol craving increased the chances of suicidal ideation, however, when it was present along with other psychiatric disorders, the risk was almost twice as high.(47) In the United Kingdom a national confidential inquiry into suicide and homicide found that 45% of patients with psychiatric illnesses who died following deliberate self-harm over 20 years had significant alcohol use disorders.(48) In a retrospective analysis by Chitty et al, among 7467 patients with deliberate self-harm, 31.3% of suicide attempts involved alcohol ingestion along with the poison.(49) Moderate to heavy drinking of alcohol especially in a dependence pattern is strongly associated with deliberate self-harm as well as subsequent suicide attempts.

Other substance abuse has also shown to be associated with increased risk of deliberate self-harm.

Psychosocial factors linked to outcomes
• Marital status
• Socioeconomic status
• Debt
• Education
• Alcohol use disorders
• Known psychiatric illness and treatment
• Other substance abuse
• Persistent suicidal ideation

Table 8 Psychosocial factors possibly linked to outcomes of deliberate self-harm

IMPACT ON PHYSICAL HEALTH OF DELIBERATE SELF-HARM BY POISONING

Organophosphorus poisoning is known to have long-term clinical impact on the patient. Intermediate syndrome usually develops 24-96 hours after presentation. It is characterized by weakness involving the neck, bulbar, respiratory and limb muscles. Patients might require prolonged ventilation and recover between 4 to 18 days. The incidence of intermediate syndrome varies between 18% and 70% in various studies.(50) Patients who are intubated and ventilated can have complications related to intensive care including but not limited to ventilator associated pneumonia, post tracheostomy tracheal stenosis, laryngotracheal injury, stomal infection and critical care psychosis. In case of hospital-acquired infections, they could also develop sepsis complications, acute respiratory distress syndrome, acute kidney injury and chronic kidney disease.(51,52) These could have an impact in the long term including increased risk of chronic kidney disease, obstructive and restrictive lung disease.

Neurological sequelae of poisoning

Delayed polyneuropathy (OPIDN) is well described. It usually sets in one to three weeks following ingestion. The first symptoms are paraesthesia and pain of the legs. It usually starts as a distal weakness of the lower limbs which progresses proximally and can involve the trunk. The deep tendon reflexes are depressed. Those with mild neuropathy improve and have a good outcome, however those with more severe involvement are left with residual weakness. Deformities like claw hand, foot drop, atrophy of muscle groups, spastic gait and imbalance have been attributed to OPIDN.(50) It can also involve the corticospinal and other tracts of the spinal cord. However, this becomes evident only with recovery of the neuropathy unmasking the upper motor neuron signs. In a study of 300 patients with organophosphorus poisoning, monoplegia and mild sensory loss of legs were seen in 4 patients (2.66%) and paraplegia and weakness of arms were seen in 2 (0.66%).(53) These symptoms had appeared after 4 weeks of consumption of poison.

These problems can make it difficult for the patients to smoothly integrate into society. Those who were involved in skilled labour or professions requiring the use of fine muscles of the hand (e.g. musicians) can be left devastated by these neurological deficits. The deformities which develop can lead to social stigma. For those with severe impairment even activities of daily living can become herculean tasks. The true incidence of OPIDN is not clearly known.

Follow up of patients with high dose poisoning has shown neurobehavioral alterations including confusion, irritability, lethargy, emotional lability, fatigue, depression and

psychosis.(54) These manifestations have been described under the term chronic organophosphate induced neuropsychiatric disorder (COPIND).(55) These manifestations could be explained as sequelae of the problems during the acute cholinergic crisis. They might have had seizures, hypoxia due to respiratory failure, and arrhythmias leading to poor central nervous system perfusion. These might have had a lasting impact on the brain which manifests later as COPIND.(50) Yilmazlar et al found changes in the brain on SPECT imaging in patients with organophosphorus poisoning which were related to the severity of poisoning, despite avoiding other causes of brain injury due to hypoxia or poor perfusion to the extent possible.(56) This suggests a direct effect on the parenchyma leading to poor perfusion independent of indirect systemic effects.

Other complications include extrapyramidal manifestations including dystonia, tremors, chorea and bradykinesia.(54) In a prospective observational study Kent et al assessed the presence of tremors, dystonia, chorea and rigidity in patients with severe poisoning using the Unified Parkinson's Disease rating scale and the Tremor rating scale.(57) A total of 32 patients were enrolled. Rigidity was the commonest symptom. The symptoms started after the first week, peaked at the end of second week and lasted for around 17 days. Although all the patients in this study recovered fully by the time of discharge, the percentage of patients who persist to have these symptoms has not been studied.

Pulmonary and cardiac sequelae

Organophosphorus poisoning also has pulmonary sequelae. During the acute phase there is decreased central respiratory drive, bronchospasm, hypoxia due to increased secretions

and pulmonary edema, and respiratory muscle weakness.(58) During the Iran Iraq war, in the 1980s the effects of exposure to nerve gas was studied. 11% of patients, most of whom were non-smokers, had obstructive pattern in spirometry. 58% of patients had abnormal CT imaging of the thorax showing mostly emphysema.

Hung et al studied the association between cardiovascular disease and organophosphorus poisoning. They studied 7561 patients and had an age-matched control group of 30244 individuals. They found higher incidence rates of arrhythmias, coronary artery disease, and heart failure sub-hazard ratio of 1.40, 1.13, and 1.12 for each respectively as compared to the control population.

Renal disease and iatrogenic sequelae

The patients who have taken other poisons common in South India such as yellow oleander, Oduvanthalai, supervasmol and prescription medications have not been followed up in large studies in order to assess the long-term complications. However, the acute complications are known. For instance, the cardiac glycosides(Oleander) can have severe cardiotoxicity including heart blocks, arrhythmias and cardiac arrest which can logically lead on to long term complications because of the hemodynamic compromise which can occur.(59) The acute complications of Oduvanthalai poisoning have been mentioned above. The hyperchloremic metabolic acidosis, distal renal tubular dysfunction, hypokalemia, refractory hypotension all could possibly lead to sequelae.

Intubation and mechanical ventilation have complications directly related to them. The early complications include lip ulceration, cellulitis, aspiration, pharyngeal injury, bleeding, glottis edema, tooth avulsion and iatrogenic pneumothorax. Late complications range from persistent sore throat, hoarseness of voice, dysphagia and odynophagia to tracheal stenosis. A prospective study of 150 critically ill adult patients found that 9 patients with tracheostomy later developed tracheal stenosis.(60) A 12 month study of critically ill patients who were intubated found that 10% of patients developed established tracheal stenosis.(61)

Sequelae of poisoning
COPIND
OPIDN
Neuropsychiatric disorders
Extrapyramidal syndrome
New onset mood disorders
Hypoxic ischemic encephalopathy
Obstructive lung disease
Chronic kidney disease
Renal tubular dysfunction
Tracheal stenosis
Coronary artery disease
Arrhythmias
Chronic pain
Deformities

Table 9 Possible broad sequelae of poisoning

The outcome of deliberate self-harm with respect to the above parameters has not been extensively studied across the world. In India there has not been any large study which has followed up patients with deliberate self-harm to assess their socioeconomic status, physical and mental health. These factors might help us understand better why these patients harm themselves. Although in India especially in the south, most attempts are thought to be impulsive behaviour without much planning or isolation. However, in those who have significant risk factors we do not know about the persistence of these. Moreover, being an area with high incidence of suicide, it is important to understand the problems in incorporation back into society that these patients face after discharge.

METHODOLOGY

Among the cohort of patients who presented to CMC with a diagnosis of deliberate self-harm by poisoning in the time period between 2009 and 2014 to the department of General Medicine, those who were willing and satisfied the inclusion criteria were sequentially recruited till sample size was achieved. The primary assessment of these patients was done by telephonic interview. For further analysis, the patients were called for detailed interview and physical examination to the hospital. The interview assessed the socioeconomic, psychological and clinical profile of these individuals following the deliberate self-harm attempt. The outcomes which were assessed were effects on physical health, long term effects of the poisoning if any, employment, marital status, education, stressor at initial attempt, socioeconomic status, financial situation including debts, substance or alcohol abuse, health-seeking behaviour and depression.

STUDY DESIGN

This is an observational cohort study conducted in the department of General Medicine at the Christian Medical College, Vellore from July 2016 to July 2017.

INCLUSION CRITERIA

Patients who were admitted to CMC Vellore with a diagnosis of deliberate self-harm by poisoning from 2009-2014. Those who have completed the age of 15 years at the time of deliberate self-harm attempt. The patient should be resident of an area that is within 100 km of CMC Hospital, Vellore.

SAMPLE SIZE

This is a descriptive, qualitative study of the socioeconomic, clinical and psychological outcomes of deliberate self-harm by poisoning.

There have been a few major studies from other countries which have followed up patients who have attempted deliberate self-harm. However, these have not followed up the outcomes which have been analysed in this study. There are no large studies in India looking at the outcome of deliberate self-harm. As this study uses both qualitative and quantitative variables and is a pilot study, after discussion with our collaborators, we concurred on a sample size of 100.

BASELINE ASSESMENT

We went through the medical records in order to collect baseline data regarding the patients. These records were from the time of admission for the index attempt of deliberate self-harm. Whatever data which could be obtained from the discharge summaries and outpatient charts was collected. Though there were lacunae in the data, it was mostly complete.

The baseline characteristics which were assessed and the proforma for collection is given in detail in the annexure.

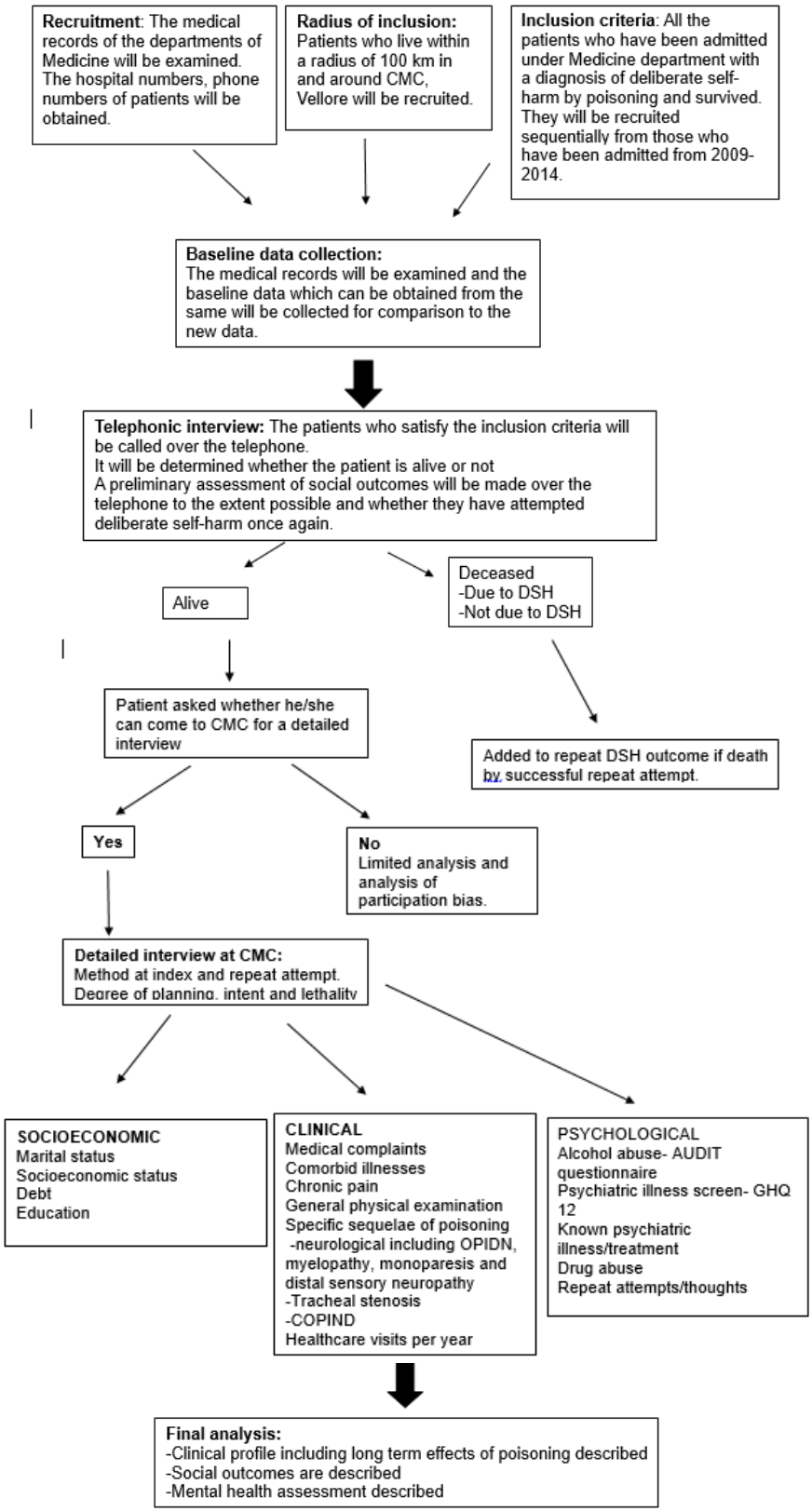


Figure 3 ALGORITHM OF THE STUDY

TELEPHONIC INTERVIEW

The patients were contacted via telephone by the principal investigator. Following introduction and confirmation of the patient ID, they were informed regarding the purpose of the call and the study. Verbal informed consent was obtained at the outset for collection of data. All patients were requested to appear for the detailed interview at the hospital. The proforma for telephonic interview is given in the annexure. The patients who were willing to come underwent a detailed interview and physical examination.

DETAILED ASSESSMENT

The patients who were willing to appear for the interview underwent a detailed assessment of their social, economic, psychological status followed by a thorough physical examination. Written informed consent was obtained prior to the interview and examination. The proforma for the same is included in the annexure. Those who warranted a further evaluation were given laboratory tests depending on the clinical evaluation. They were asked to review at a later date with investigation reports.

STATISTICAL METHODS

The data entry forms were designed using epidata manager v4.2.0.0. The data entry was done by the principal investigator using the epidata entry client v4.2.0.0.

Chi-square/ Fisher's exact test was used to assess the association between the categorical variables. Pearson's correlation was used to measure the correlation. Two Independent sample t test was used for normally distributed variable.

FUNDING AND IRB APPROVAL

Funding source

A FLUID Research grant (Institutional grant) was approved for conducting this study. The funds were used for the laboratory investigations and to grant travel allowance for the patients who had to come from far off places.

Institutional research board approval and ethical considerations

The research proposal was discussed with the Institutional Review Board on the 6th of July 2016 and approval was obtained [IRB Min. No. 10167 dated 06.07.2016].

As this was an observational cohort study, there were no major ethical issues involved**.** The Institutional Review Board approval was obtained prior to the commencement of this study.

RESULTS

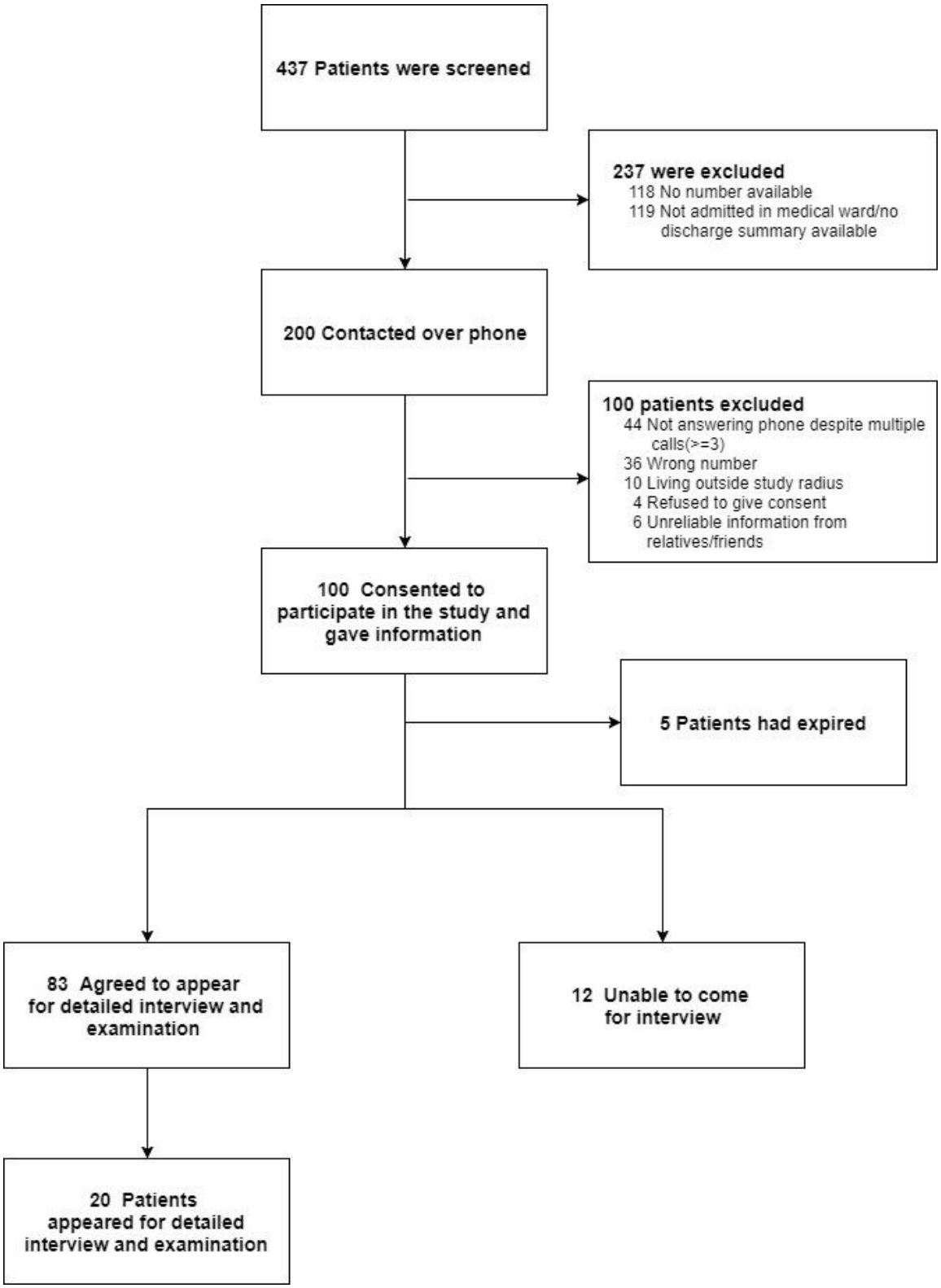


Figure 4 Strobe statement.

BACKGROUND AND INDEX EVENT

DEMOGRAPHIC CHARACTERISTICS

A total of 437 patients were screened from the cohort in the poison database maintained by CMC. 237 were excluded as either the telephone number was unavailable or they had not been admitted. 200 were contacted by phone of whom 100 were excluded due to several reasons as mentioned in the flowchart. Finally, 100 patients consented and were willing to participate in the study. 5 patients had expired following the index attempt of self-harm. 12 people were unable to come for interview due to various reasons. However, they gave information over the telephone. 83 people agreed to come for detailed interview and physical examination. Finally, 20 people actually presented to the hospital for detailed interview and examination.

TELEPHONIC INTERVIEW STUDY

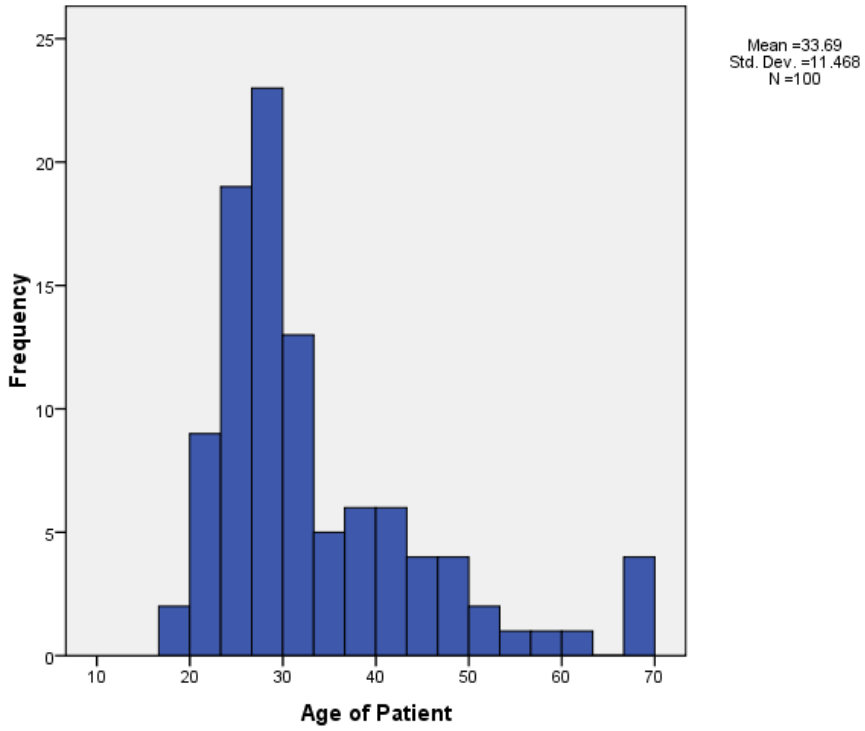


Figure 5 Proportion of patients in various age groups (N=100)

The mean age of patients was 34 years (SD 11.46) ranging from 19 years to as high as 69 years of age. More than 75% of the patients were less than 40 years of age. The percentage of males was slightly higher at 53% and that of females was 47%.

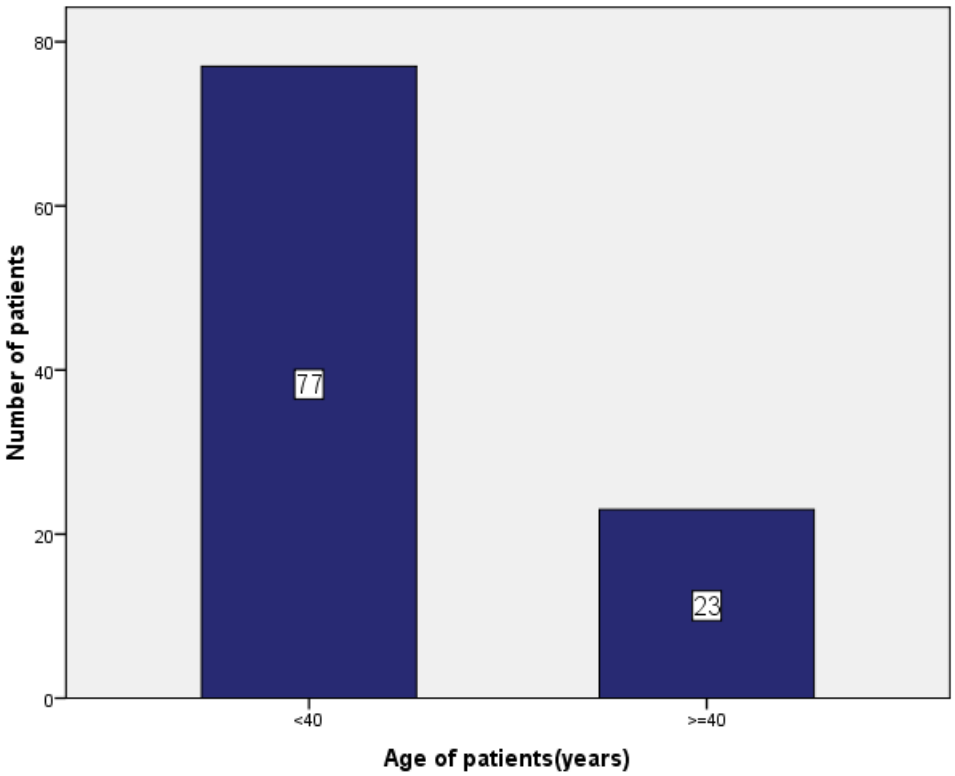


Figure 6 Proportion of patients above and below 40 years of age (N=100)

BASELINE EVALUATION AT INDEX SELF-HARM

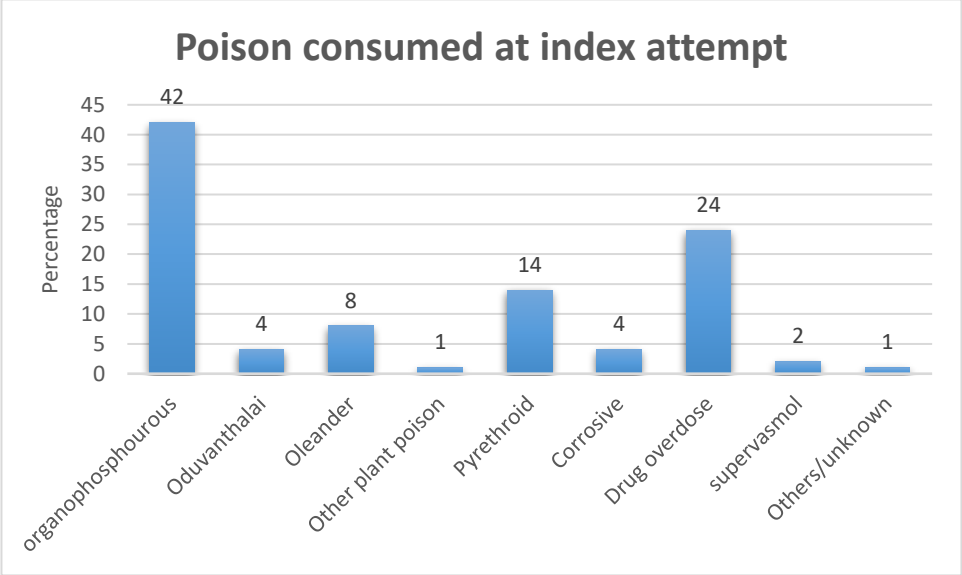


Figure 7 Poison consumed at index attempt (N=100)

The commonest poison consumed at the time of index deliberate self-harm was organophosphorus (42%). This was followed by prescription medication overdose (24%), pyrethroids (14%), oleander (8%), oduvanthalai (4%) and others.

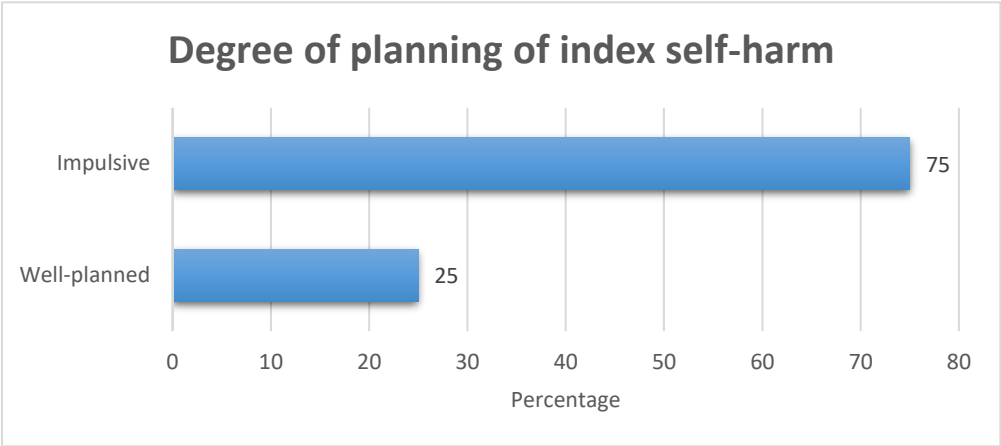


Figure 8 Degree of planning (N=100)

In most of the patients who consumed poison, it was an impulsive act for them in the spur of the moment. However, 25 percent of them had deliberately planned the act indicating a high intentionality.

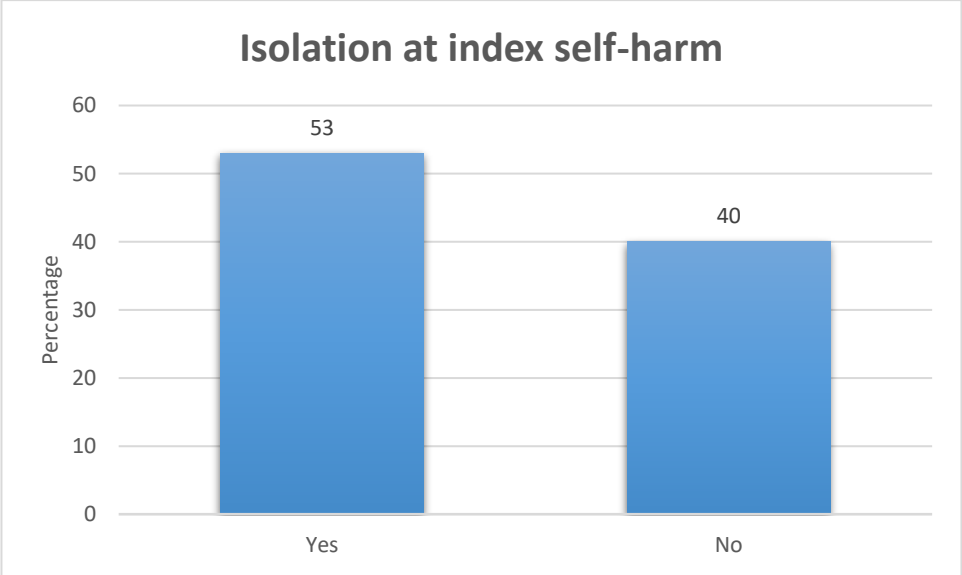


Figure 9 Isolation at index attempt (N=100)

At the time of initial self-harm, 53 percent of patients had isolated themselves away from relatives or friends to consume the poison and 40 percent had informed a relative within a short time period about having consumed the poison.

One third of patients cited relationship issues as the cause for self-harm. The stressor in other patients included psychiatric illness (9%), financial burden (7%), occupation related problems (3%), problems related to peers at school or college, health related issues and others. In 33 percent of patients, the data was unavailable or undisclosed.

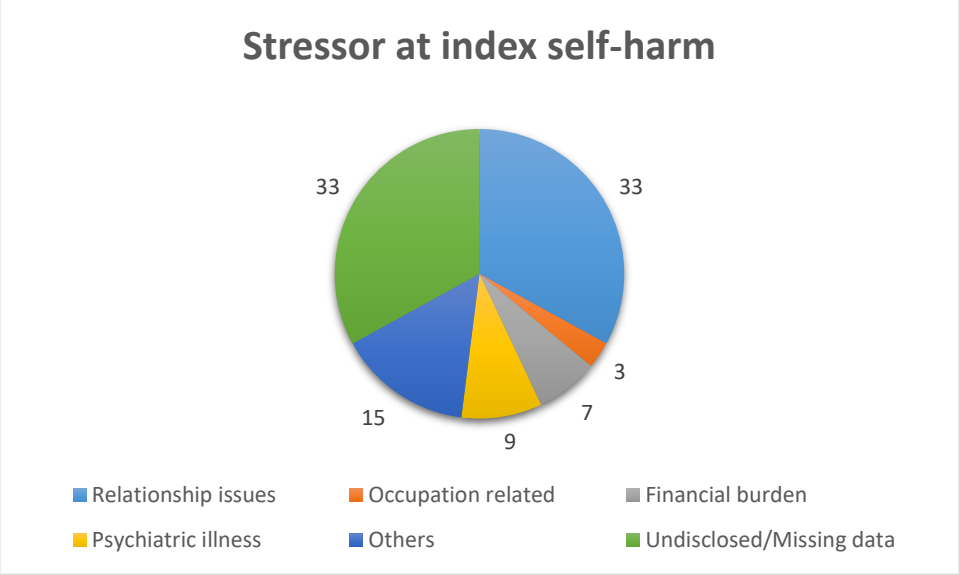


Figure 10 Stressor leading to self-harm at index attempt (N=100)

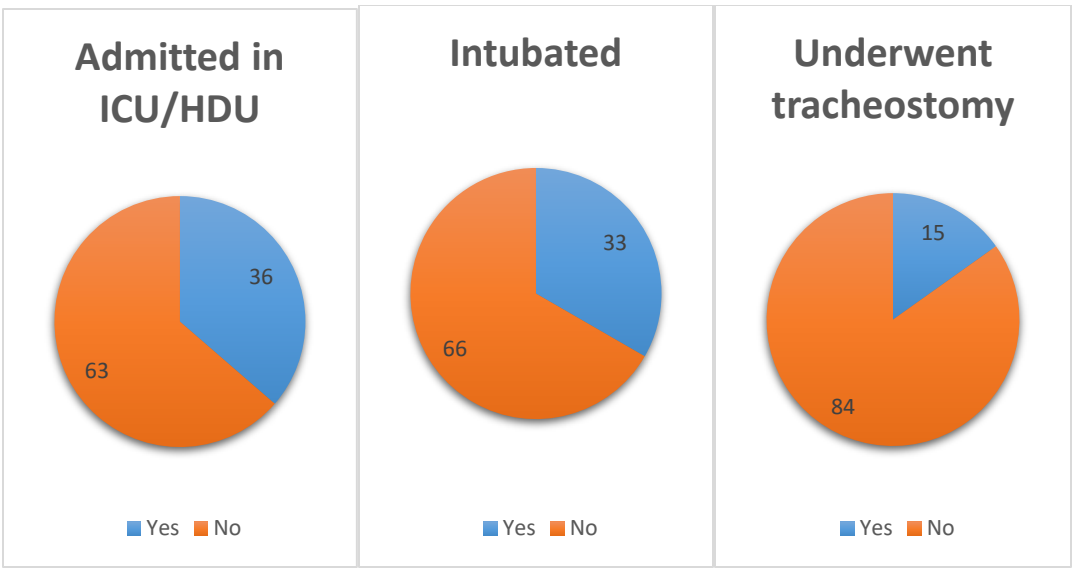


Figure 11 Course in hospital (N=100)

At index admission 36 percent of patients required to be monitored in an intensive care setting, either in the ICU/HDU. 33 percent required tracheostomy and 15 percent underwent tracheostomy.

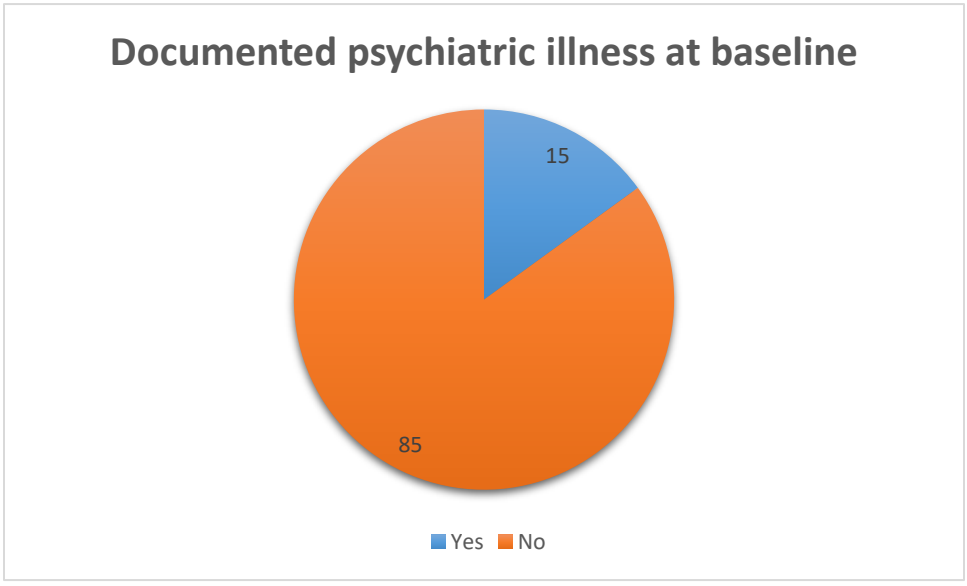


Figure 12 Documented psychiatric illness at baseline prior to index admission(N=100)

15% of patients had been documented to have a psychiatric illness at baseline evaluation from medical records. They had an evidence of a psychiatric illness prior to the initial admission.

DURATION OF ADMISSION AND TRACHEOSTOMY

The median duration of stay was 5 days (IQR 3-10) during the initial admission. The median duration of tracheostomy was 25 days (IQR 18-30) days. There was one patient who stayed for 33 days which was the longest. The longest duration of tracheostomy was 40 days.

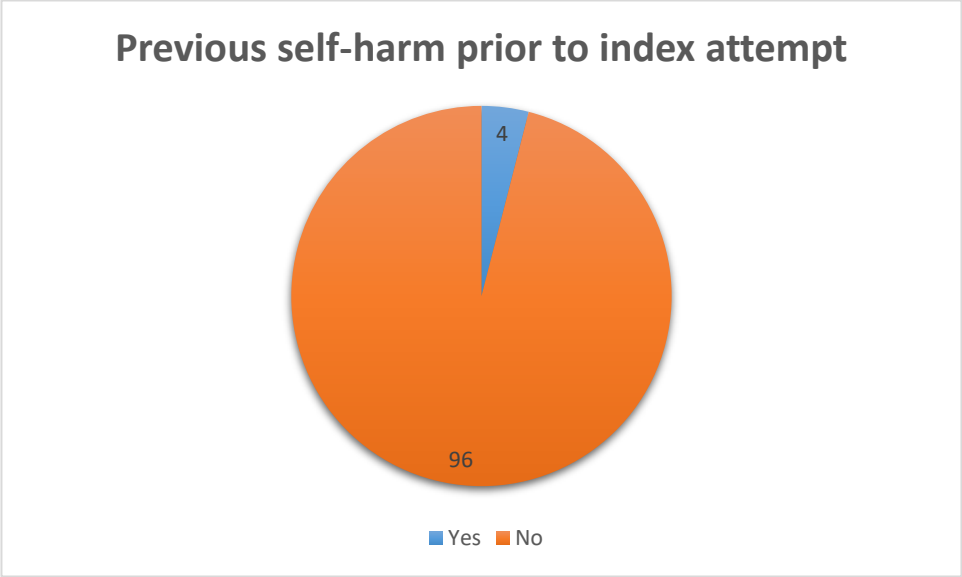


Figure 13 Previous self-harm history prior to index attempt (N=100)

4 percent of patients had a prior attempt of deliberate self-harm before the index admission in CMC.

INDEX ATTEMPT METHOD AND DURATION OF STAY

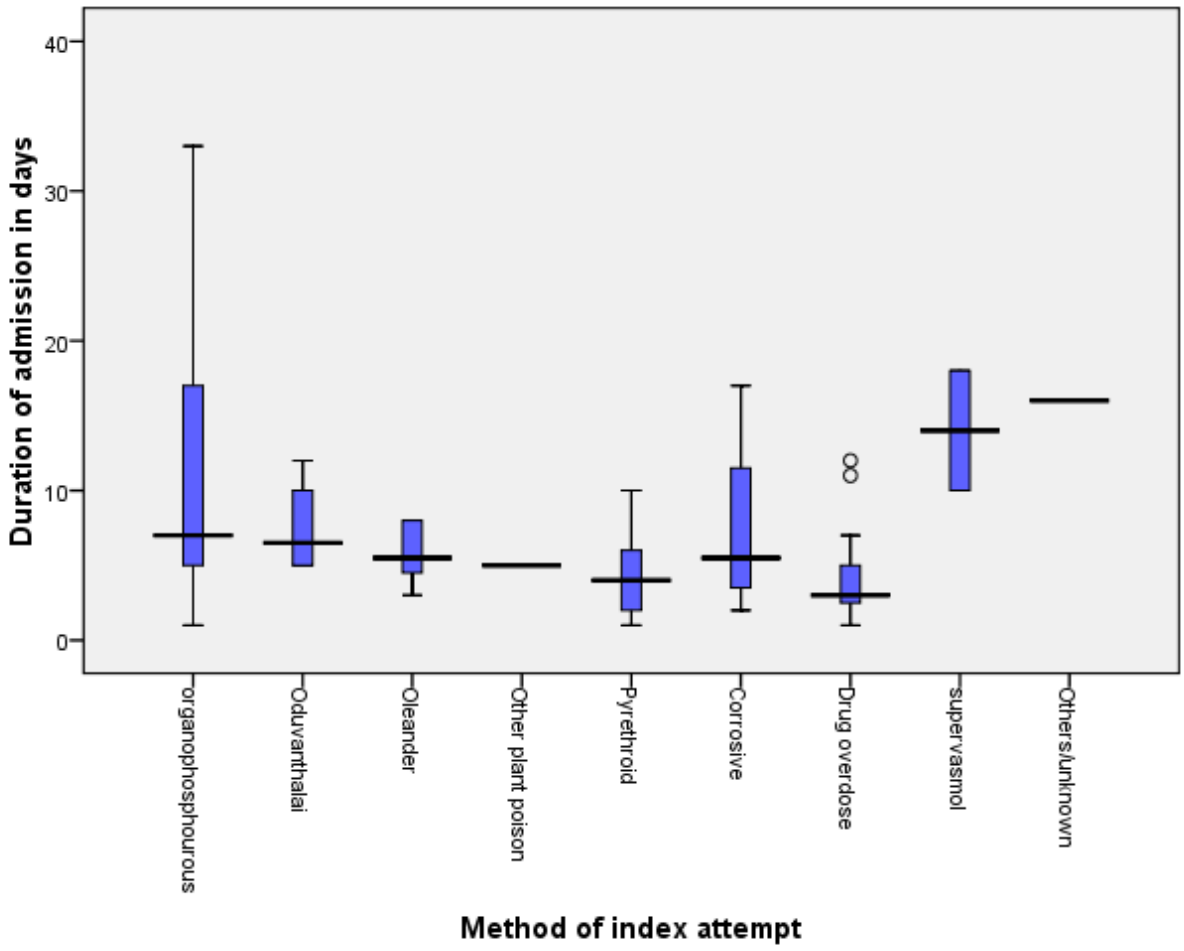


Figure 14 The duration of stay based on the index method used for self-harm

On average the duration of stay was more or less the same for all the different poisons used at index attempt. However, there were a few patients with organophosphorus, corrosive and supervasmol poisoning who stayed significantly longer than the average duration. The median duration of stay for the remaining poisons varied between 4 to 7 days.

TELEPHONIC INTERVIEW STUDY

PERSONS WHO PROVIDED INFORMATION DURING TELEPHONIC INTERVIEW

Most of the data was obtained from a first-degree relative. The next commonest source was a distant relative. Only 15 percent of telephonic interview had the patient themselves giving information. The remaining 9 percent information was from a friend or neighbour. The low percentage of information from the actual patients themselves can be explained by the observation that a relative or a friend brings the patient to the hospital following the deliberate self-harm and during registration gives in their contact details.

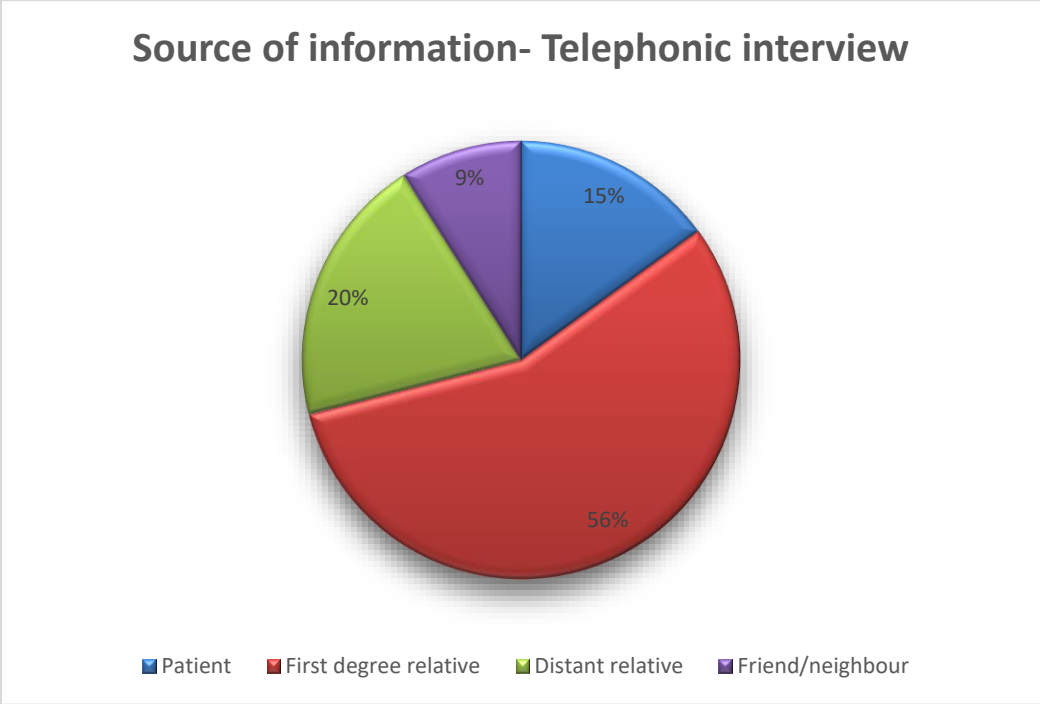


Figure 15 Source of information in telephonic interview (N=100)

OCCUPATION

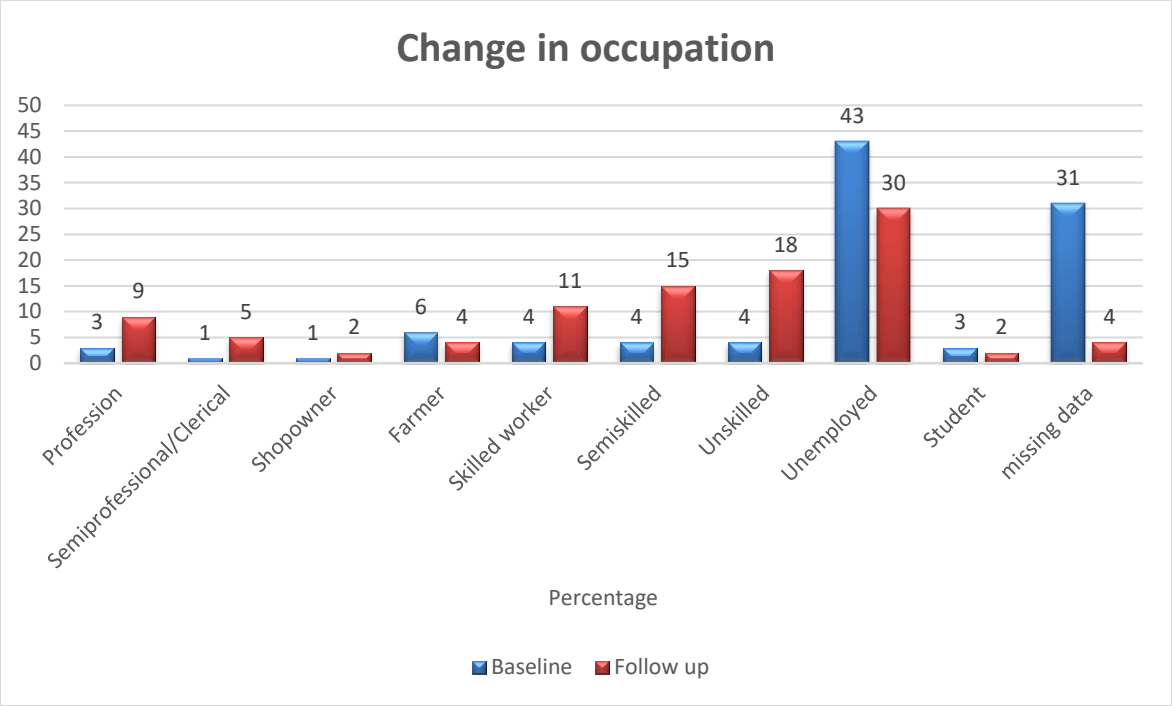


Figure 16 Occupation at baseline compared with follow up (N=100)

The main change which was noted was that the proportion of people who were unemployed had come down from 43% at baseline to 30% at follow-up. There were small increases in the proportion of people who were unskilled, semi-skilled, skilled, semi-professional and professional. In total 69% of people had a change of their occupation from baseline. In 29 patients there was upgrading of occupational classification between the index episode and follow up. In 9 patients there was down grading of occupational classification. Only 4 percent were farmers, 2 percent were shop owners, four percent were professionals and 2% were students at follow up. There was missing data of 31 percent at the baseline from the medical records.

PROFESSION	NUMBER	NEW JOB CATEGORY
UPGRADING		
Unemployed	20	Various job categories
Farmer	4	Semiskilled (2) and skilled (2)
Semiskilled	4	Profession (3) Semi-professional (1)
Unskilled	1	Shop owner
DOWN GRADING		
Professional	1	Skilled worker
Semi-professional	1	Unemployed
Shop owner	1	Semiskilled
Skilled workers	3	Farming (1) and unskilled (2)
Unskilled	3	Unemployed

Table 10 Change in occupation according to baseline job (N=100)

EDUCATIONAL STATUS

The patients who were followed up studied mostly up to high school (8^{th} to 12^{th} STD) with 46 percent of the total study group having studied only till the tenth standard. 19 percent had done a diploma course. Only 2 percent had studied professional courses and 9 percent were graduates. 10 percent of the study group were illiterate.

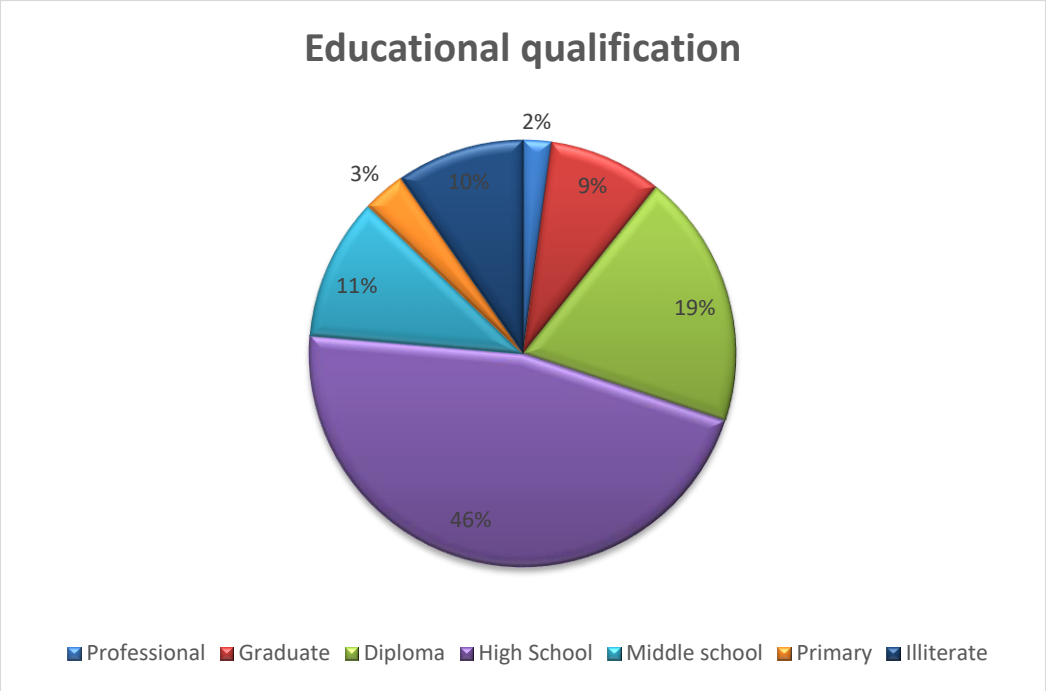


Figure 17 Highest educational qualification (N=100)

CHANGE IN RELATIONSHIP STATUS

During assessment of baseline characteristics from the medical records, we assessed the marital status to the extent possible. The data was not complete and there were a few patients with missing data on their relationship status at the baseline.

At the time of initial attempt, the 65 percent of patients were married, which increased to 86 percentage at the time of follow up. There was one person who was separated from spouse at baseline evaluation, who had remained separated. The percentage of single people decreased from 28 percent to 11 percent.

The change in relationship status can be attributed to the age of presentation of the patients. Those who were young and unmarried had as the years went by, gotten married.

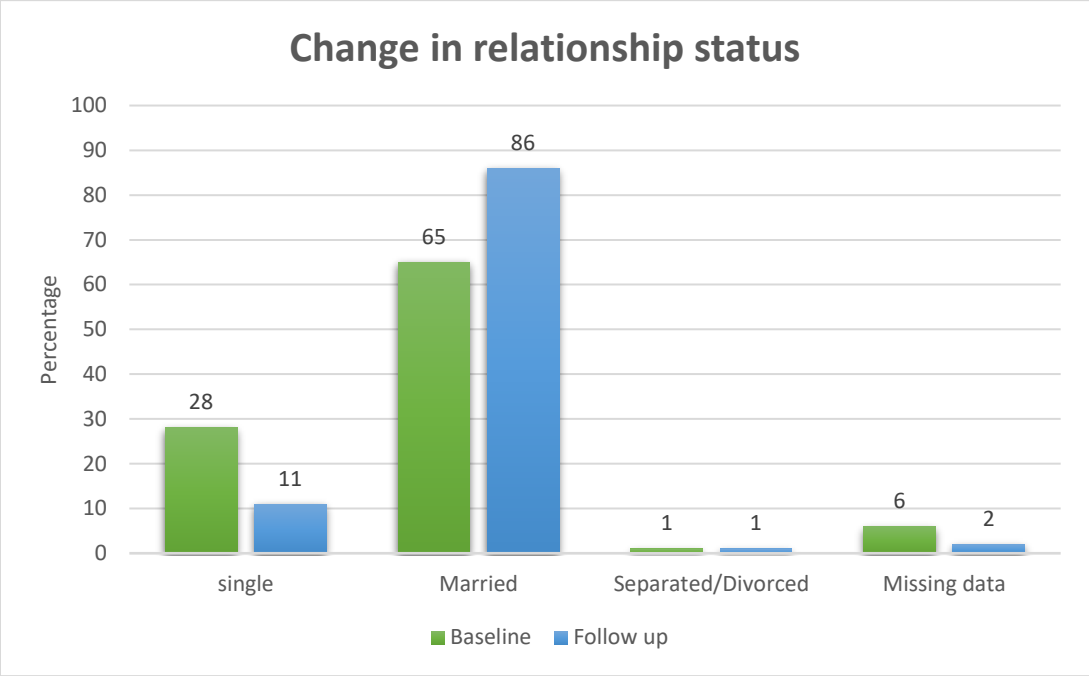


Figure 18 Relationship status at baseline and follow up (N=100)

FINANCIAL STATUS

Patients were asked on the telephone whether they had financial difficulty or not. Nearly half of the patients contacted over telephonic interview reported that they had financial difficulty (47%) or were in debt (2%). Among the patients who successfully reattempted suicide, debt was cited as the reason for the same for one patient by the relative who gave information. 51% of the patients did not express any financial difficulty over telephonic interview.

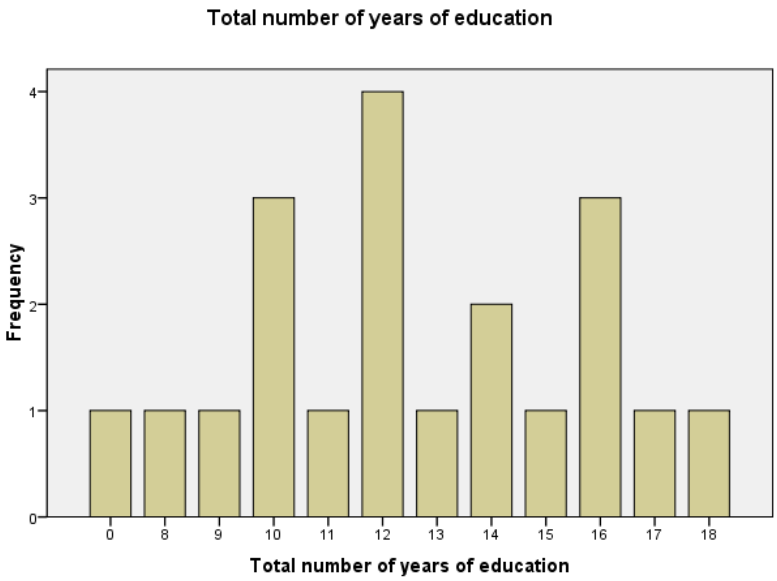


Figure 19 Total number of years of education (N=20)

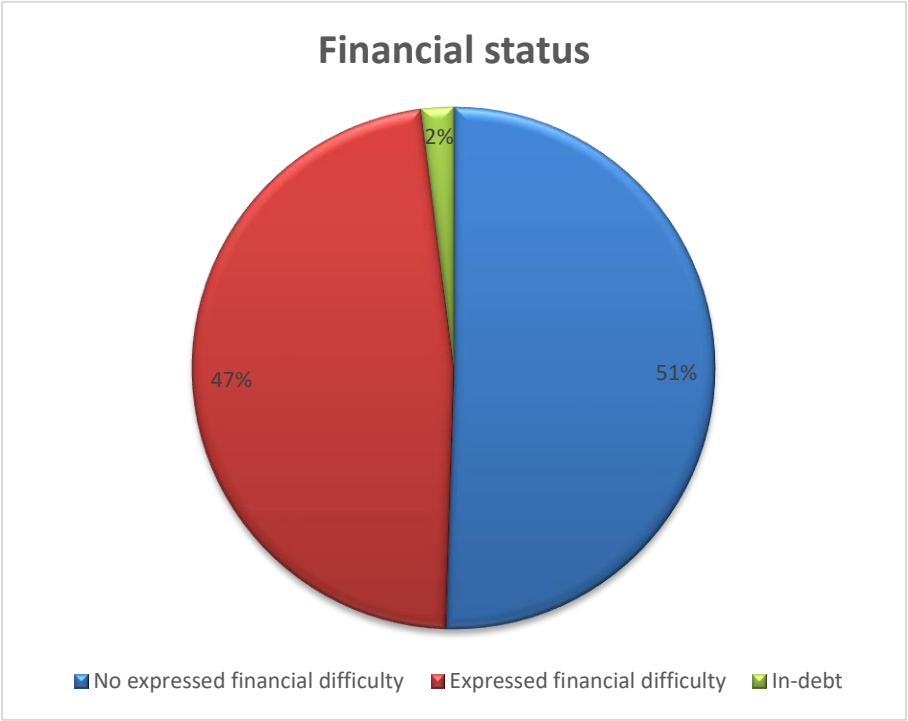


Figure 20 Reported financial status (N=100)

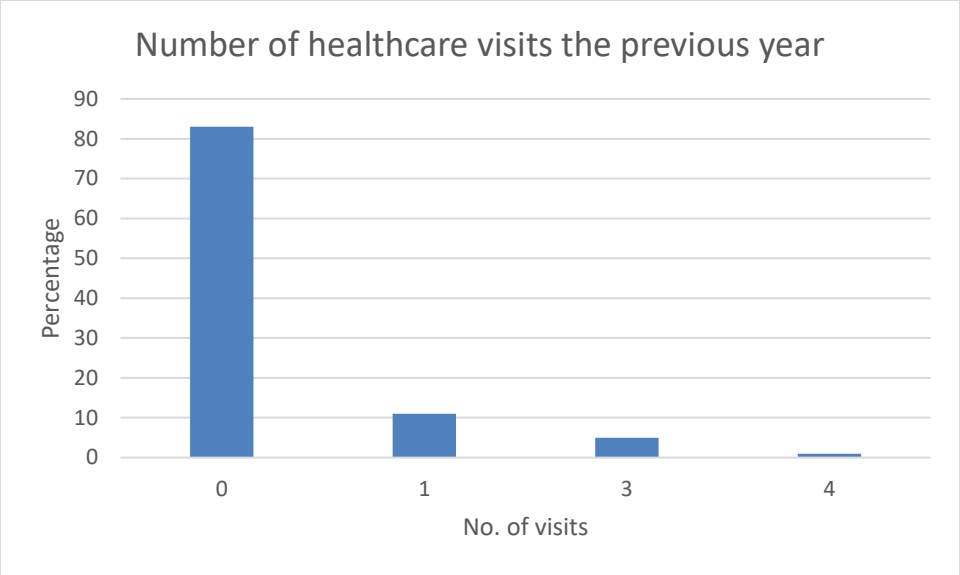


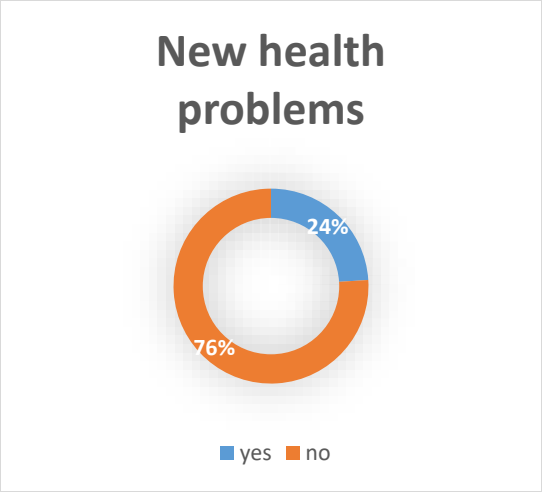
Figure 21 Number of health care visits (N=100)

Eighty three percent of patients had not visited the hospital the previous year. This was the case at the time of baseline assessment as well. (85 percent of patients had not visited the hospital in the preceding year.) Only one percent had visited the hospital 4 times or more. This indicates that most patients remained well and did not have reason to seek medical help.

PHYSICAL HEALTH PROBLEMS

At the time of follow up 24 percent of patients developed a new health issue. The remaining did not have any new health problem since the time of index deliberate self-harm.

23 percent of individuals had another admission in CMC or another center following the index deliberate self-harm episode.



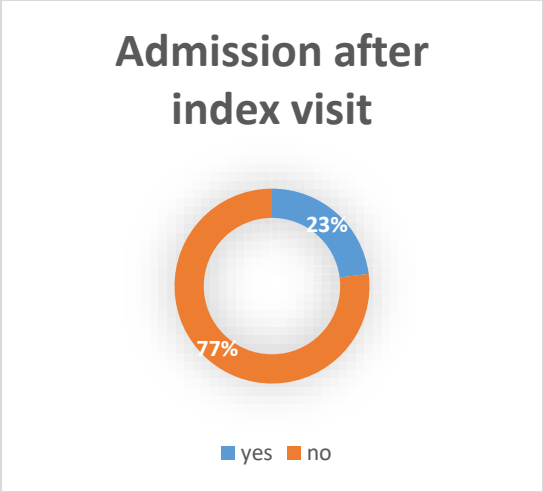


Figure 22 New health problems and admissions following index visit (N=100)

DEPRESSION SCREEN BASED ON THE PUBLIC HEALTH QUESTIONNAIRE

PHQ score	Percentage
0	80%
1	5%
2	7%
3	4%
4	2%
6	2%

Table 11 PHQ scores as a screening tool for depression

The Public health questionnaire (PHQ) score was used as screening tool for depression. A cut-off score of 3 was used. A total of 8 percent of the study population had a PHQ score of 3 or more.

MORTALITY

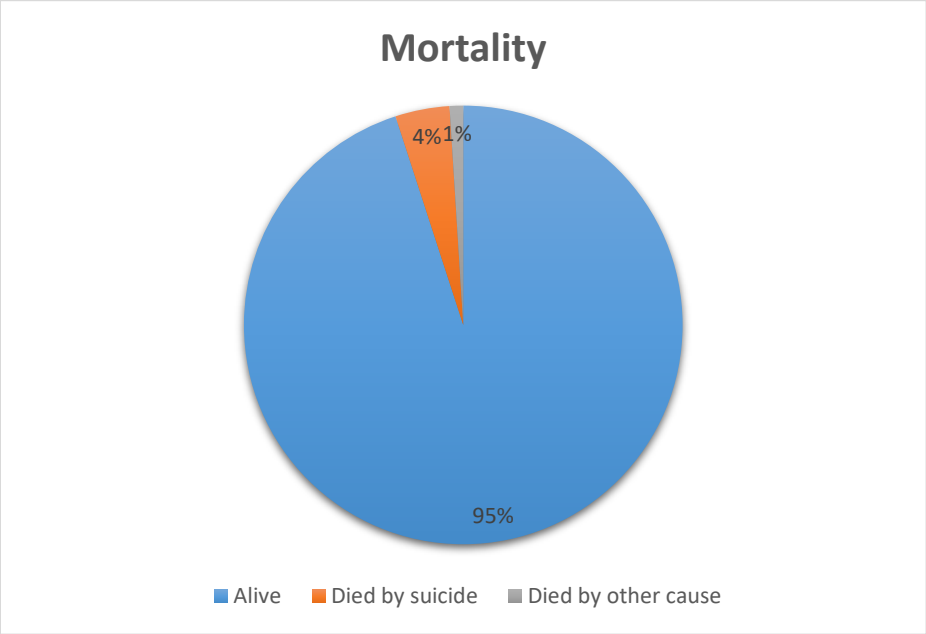


Figure 23 Deaths in follow up patients (N=100)

At the time of follow up, 95 of the patients were alive. 5 patients had passed away of whom 4 had died due to repeat deliberate self-harm. 1 patient had passed away due to other causes. The mortality rate at follow-up was 5% and rate of reattempt and suicide rate was 4%.

CHARATERSITICS OF THOSE WHO DIED BY REPEAT SELF-HARM

A total of 4 patients died by repeat deliberate self-harm. One patient was female and 3 were males. One person was divorced and the other 3 were married. Only one of them had come for follow up in the last one year to CMC or to any other center.

Out of the 4 patients, 2 were involved in unskilled labour, one was in skilled labour while the third person's occupation was not disclosed by the relative. One of them was a chronic alcohol consumer in dependence pattern. None of them had any medical co-morbidities.

According to the PHQ depressions screening score, 2 out of the 4 had depression. Two people were educated albeit only up to high school and the other 2 were illiterate. Three of them expressed financial difficult. One of them was admitted in intensive care. None of them were intubated or ventilated.

The index deliberate self-harm was by organophosphorus, oleander, phenobarbitone and pyrethroid in each patient respectively.

The index method was of high lethality in 3 people while it was of moderate to low lethality in the other person.

Patient A

28-year-old male patient. The death of this patient was reported by a local religious leader who had given his number at the time of initial admission. He had been divorced from prior to the initial attempt. He had not remarried. His baseline financial status and education were unknown. According to the informant, he had been visibly depressed following the first episode but had not sought any treatment. He was also consuming alcohol in dependence pattern. He had committed suicide by jumping off a cliff a few years after the initial attempt.

Index attempt: 2012

Death: 2016

Patient B

26-year-old female patient. The informant was a distant relative. She was married, illiterate and had shown signs of depression as reported by the relatives. Unskilled labour was her occupation. She too had not sought any help for depression. Her financial status was reportedly poor. This was a contributing factor according to the relative.

Index attempt: 2012

Death: 2013

Patient C

30-year-old male patient. The informant was a distant relative. He was married, involved in unskilled labour and had studied up to high school. According to his relative, he was in debt, a factor which contributed to the suicide. During the second attempt he was taken to another hospital, but could not be saved.

In summary the common features in the three cases was persistent psychological problems, financial difficulties and not accessing health care for these.

Index attempt: 2013

Death: 2017

Patient D

40-year-old male patient. Prior to the index attempt had a previous self-harm episode. The method used in both episodes was overdose of prescription medications, amitriptyline and phenobarbitone. He had documented alcohol consumption in dependence pattern. He had come for follow up for detailed assessment and interview. A few months after the interview, we learnt over telephonic correspondence that he had repeated suicide by hanging and had passed away. This was his third attempt. According to the interview, he did not show any signs of depression as the PHQ2 score was 0 and GHQ12 score was 1. He did not report any financial issues. Although, on examination he had asymmetric sensorimotor polyneuropathy with wasting and contractures of distal upper limb which made his work as electrician difficult. He had not expressed suicidal tendencies during the interview. However, during the interview, he appeared withdrawn and reluctant to appear for follow up.

Index attempt: 2009

Death: 2017

CLINICAL EVALUATION STUDY

METHOD OF INDEX DELIBERATE SELF-HARM

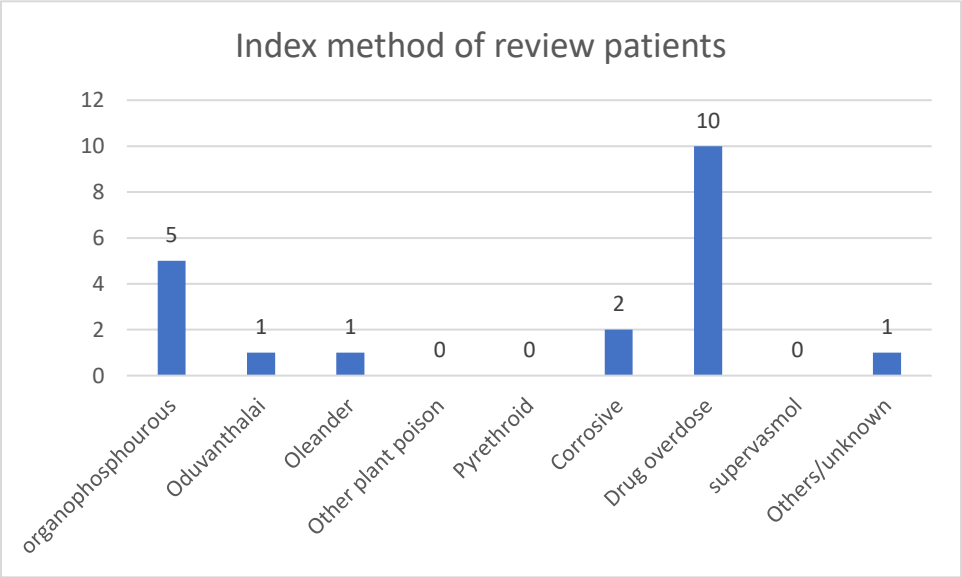


Table 12 Index method of those who came for follow up

As is evident from the above graph, the patients who presented to us for detailed interview and examination were mostly those who had overdosed on prescription medications (10) and who had consumed organophosphorus (5) at index attempt. In contrast in the interview study there were 42% of patients who had taken organophosphorus poisoning and 24% who had taken a tablet overdose.

PHYSICAL HEALTH

A total of 20 patients appeared for detailed interview, physical examination and investigations. They were assessed for long term effects of the poison on physical and mental health.

NEW ONSET SYMPTOMS

Health issue	Number	Proportion
Any new symptoms	17	85%
Numbness/Tingling over arms/legs	7	35%
Weakness of any part of body	0	0%
Hoarseness of voice	3	15%
Dysphagia	2	10%
Odynophagia	1	5%
Decreased urine output	1	5%
Difficulty in concentrating	5	25%
Difficulty in performing routine tasks	5	25%
Chronic pain anywhere in body	12	60%

Table 13 Self-reported new health issues following index attempt (N=20)

Most patients complained of some new symptom which had appeared following their initial deliberate self-harm. Seven (35%) patients who were assessed by detailed interview complained of numbness and tingling mostly in the lower limbs. No one had muscle weakness of any part of the body. Hoarseness of voice was seen in 3 patients, dysphagia in 2, odynophagia in 1, decreased urine output in 1 patient. 5 patients had difficulty in concentrating and in performing routine tasks.

Poison at index attempt	New symptoms	Weakness	Hoarseness of voice	Difficulty in swallowing	Pain while swallowing	Decreased urine output	Difficulty in concentrating	Difficulty in performing routine tasks	Chronic pain	Numbness/ tingling
Organophosphorus	80%(4)	0%	20%(1)	40%(2)	20%(1)	0%	40%(2)	20%(1)	4(80%)	4(80%)
Oduvanthalai	100%(1)	0%	0%	0%	0%	0%	100%(1)	100%(1)	0%	100%(1)
Oleander	100%(1)	0%	0%	0%	0%	100%(1)	100%(1)	100%(1)	100%(1)	0%
Corrosive	100%(2)	0%	0%	0%	0%	0%	0%	0%	1(50%)	1(50%)
Drug overdose	80%(8)	0%	10%(1)	0%	0%	0%	10%(1)	20%(2)	6(60%)	10%(1)
Others/unknown	100%(1)	0%	100%(1)	0%	0%	0%	0%	0%	0%	0%

Table 14 Symptoms at review according to poison consumed at index attempt(N=20)

The only specific symptomatology associated with specific poisonings were:

-OP poisoning- numbness and tingling (4/5), hoarseness (1), dysphagia (2), odynophagia (1), difficulty in concentrating (1), chronic pain all over the body (4/5).

-Drug over dose- Chronic body pain (6/10).

Four out of five patients with organophosphorus and the one patient with oduvanthalai poisoning at index attempt had numbness/tingling of some part of the body at review. One out of 2 patients with corrosive had tingling sensation peri-orally.

CHRONIC MEDICAL CONDITIONS

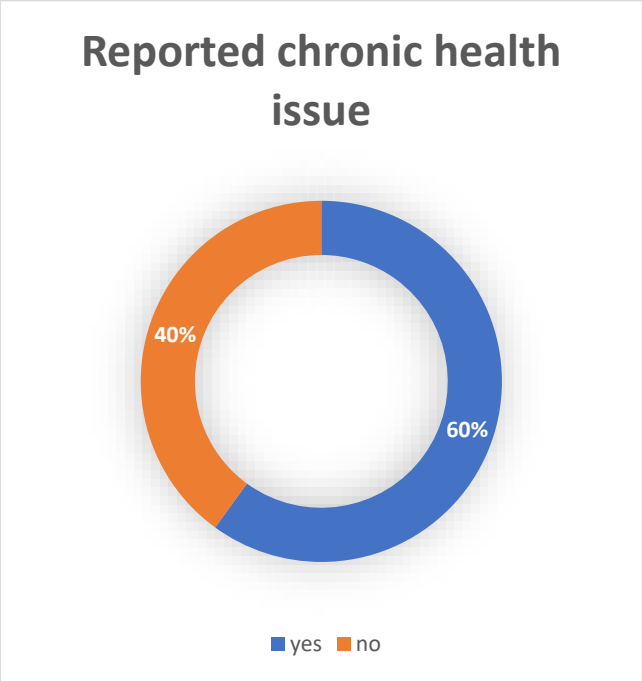


Figure 24 Self-reported chronic health issue (N=20)

40 percent of patients reported of some chronic health issue according to the perception of the patient. It did not necessarily mean that these illnesses were medically significant. 40 percent had significant medical co-morbid illnesses including diabetes, chronic obstructive pulmonary disease, bronchial asthma, hypertension and others (see table below).

Medical illness	Number
Diabetes mellitus (Young onset)	1(Newly diagnosed)
Type 2 Diabetes mellitus	1
Hypertension	0
COPD	1
Bronchial asthma	2
CKD	0
Purple Glove syndrome	1
Gestational hypertension	1
Traumatic brain injury	1
Papillary carcinoma thyroid	1
CLD	0

Table 15 Medical illnesses at follow up (N=20)

The two patients with diabetes mellitus were unaware of the illness and were diagnosed during this follow up. They were started on oral antidiabetic agents, advised regarding dietary modification, exercise, complications and regular follow up. The young man with diabetes was also referred to the endocrinology department for further evaluation.

EXAMINATION FINDINGS

The median pulse rate was 84 per minute (IQR 76-88) and the blood pressure 120/70 (IQR 110/70 – 130/80) mmHg. Pallor was present in one patient. Stridor was heard in one patient who had undergone tracheostomy and a thrill could be palpated over the trachea in 3 patients. This is among patients who underwent tracheostomy who were followed up

Finding	Number	Index method
Stridor	1	Organophosphorus
Thrill over trachea	2	Organophosphorus

Table 16 Stridor and thrill over trachea seen among organophosphorus group

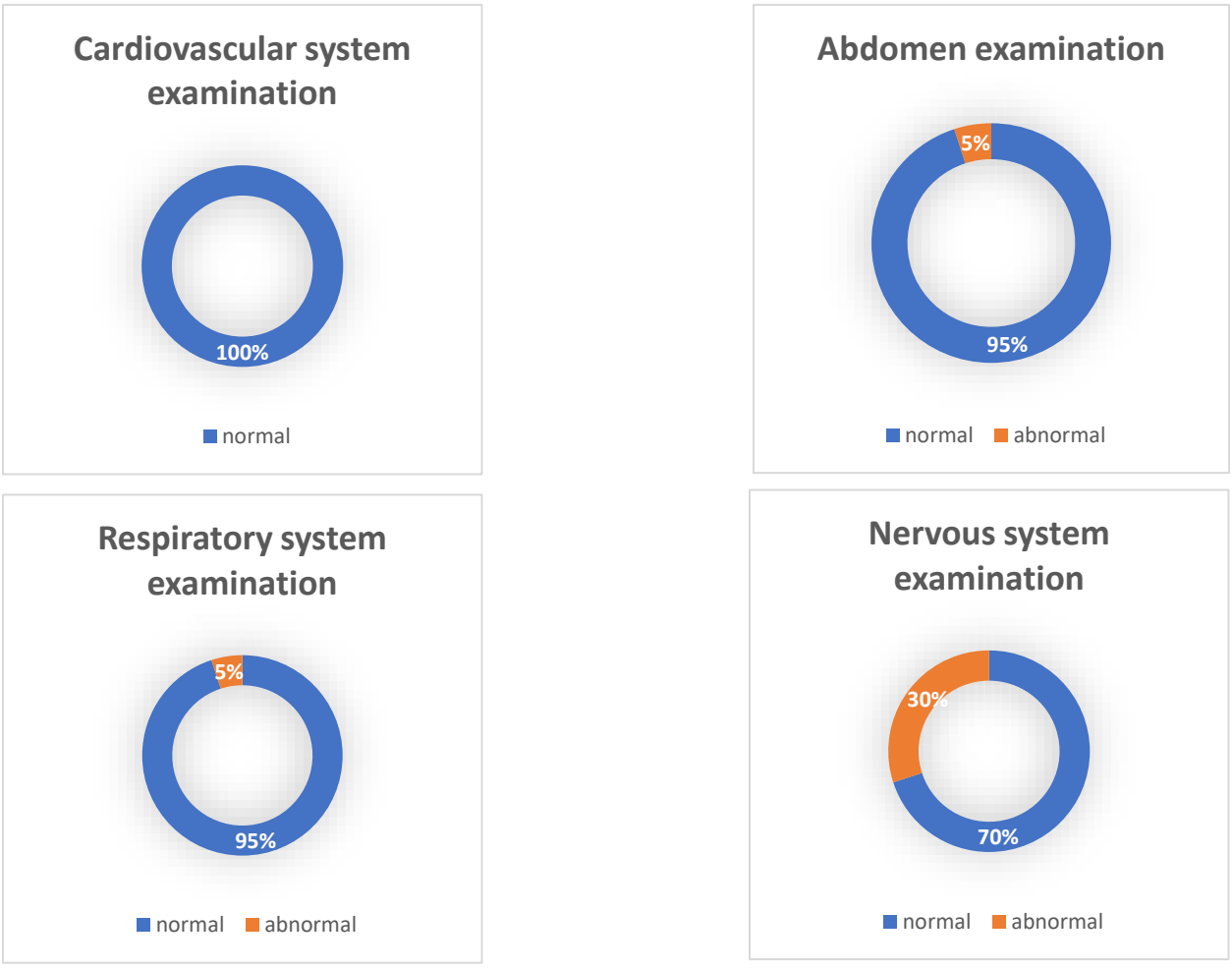


Figure 25 Systemic examination abnormalities(N=20)

The maximum number of abnormalities were seen in the nervous system examination (see table below). Symmetrical motor neuropathy was seen with carbamazepine and

nitrobenzene poisoning, mononeuritis multiplex (1 case) and lumbosacral radiculopathy (1 case) with organophosphate poisoning, asymmetric sensorimotor polyneuropathy/mononeuritis multiplex with phenobarbitone poisoning (1 case), early cognitive impairment with carbamazepine and valproate poisoning (1 case) and post traumatic brain injury with Oduvanthalai poisoning (which preceded the episode).

One patient had pallor. One patient had wheeze, and had been diagnosed earlier with bronchial asthma. One patient had mild hepatomegaly.

The detailed examination findings are given in the table below.

NEUROLOGICAL ABNORMALITIES ON EXAMINATION

Method of poisoning	Syndrome	Clinical findings
Carbamazepine overdose	Symmetrical motor polyneuropathy	Depressed knee and ankle jerk bilateral
Nitrobenzene poisoning	Symmetrical motor polyneuropathy(Diabetic)	Absent ankle jerk and depressed knee jerk bilateral
Valproate, carbamazepine overdose	Probable early cognitive impairment	Mild memory loss new onset (MMSE 28)

Phenobarbitone overdose	Asymmetric sensorimotor polyneuropathy/mononeuritis multiplex (wasting and contractures of distal upper limb which made his work as electrician difficult)	Distal weakness left upper limb grade 3 power; Absent right ankle jerk, depressed supinator jerk; Decreased sensation to touch and temperature plantar aspect of right foot
Organophosphorus poisoning	Left lumbosacral radiculopathy	Left sided radicular pain with absent ankle and knee jerk; No weakness/sensory loss
Organophosphorus poisoning	Multiple motor mononeuropathy	Depressed right and absent left triceps jerk
Oduvanthalai poisoning	Post traumatic brain injury (RTA sustained prior to the deliberate self-harm and was stressor for 2 suicide attempts)	Right UMN facial palsy; Dysarthria; Absent reflexes left side; Absent knee ankle jerk right side

Table 17 Neurological abnormalities found on examination

ALCOHOL, SUBSTANCE ABUSE AND DEPRESSION

ALCOHOL CONSUMPTION PATTERNS

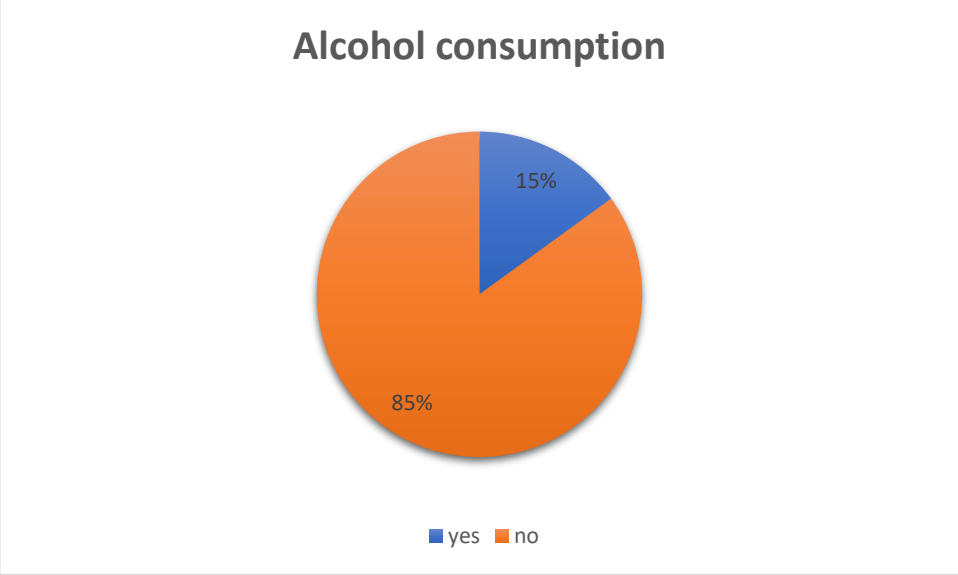


Figure 26 Prevalence of alcohol consumption in the detailed interview group(N=20)

In the group that appeared for detailed interview, 3 out of 20 (15%) consumed alcohol. The 3 patients had an AUDIT questionnaire score of 3, 7 and 9.

Hence 2 people were consuming alcohol in moderation while hazardous alcohol consumption was seen in one person.

DRUGS AND OTHER SUBSTANCE ABUSE

Among the patients who appeared for detailed assessment, none reported abuse of drugs or other substances.

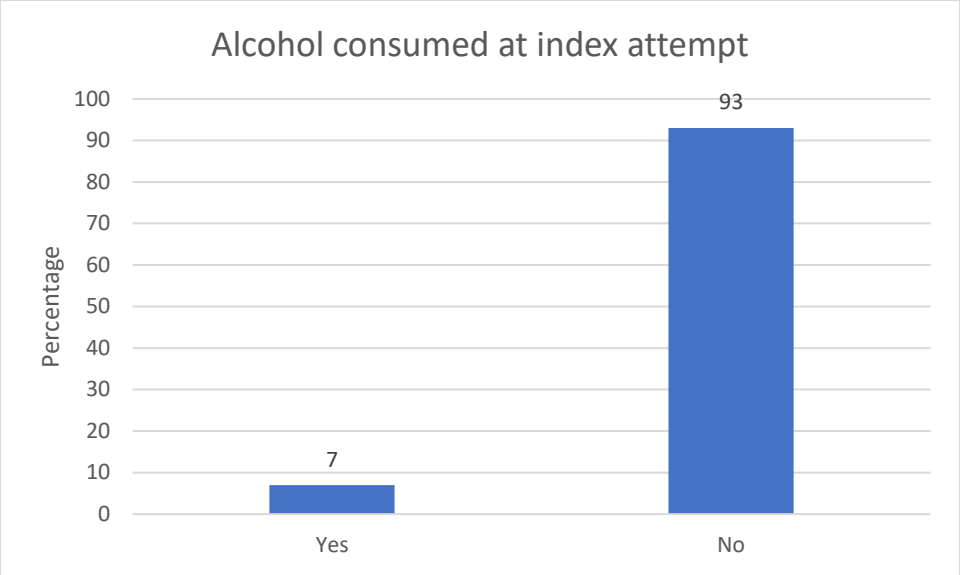


Figure 27 Percentage of patients who consumed alcohol with the poison(N=100)

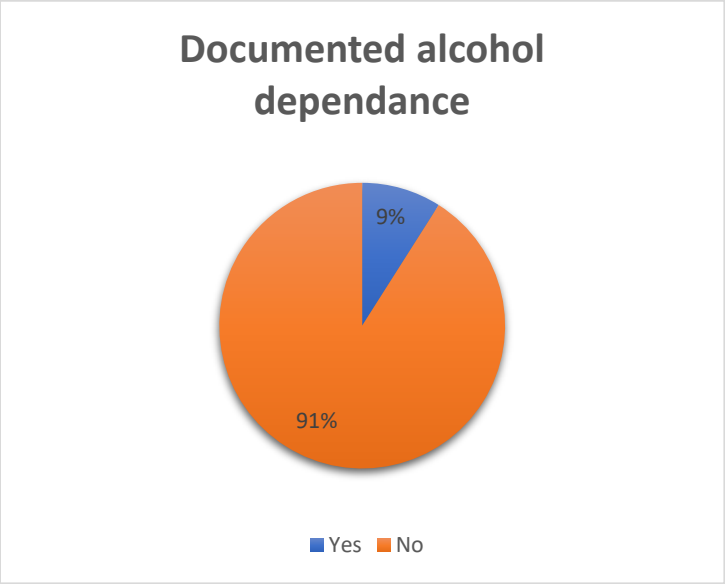


Figure 28 Documented alcohol dependence at baseline evaluation(N=100)

At baseline evaluation 9 percent of patients were documented to have alcohol dependence.

At the time of consumption of index poison 7 percent of patients had consumed alcohol along with it.

PSYCHIATRIC ILLNESS INCLUDING DEPRESSION

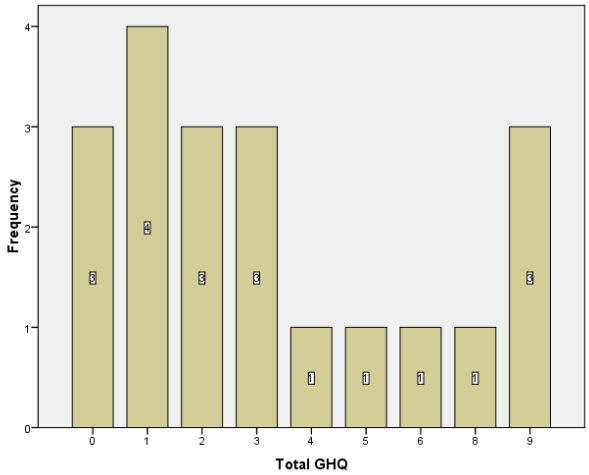


Figure 29 Psychiatric illness including depression GHQ12 (N=20) screening

The 12-item General Health Questionnaire (GHQ12) was used to screen for psychiatric illness. The cut-off used for this was 3. Among the patients who appeared for detailed interview the 7 out of 20 (35%) had a score above 3 indicating the presence of psychiatric illness as compared to the general population.

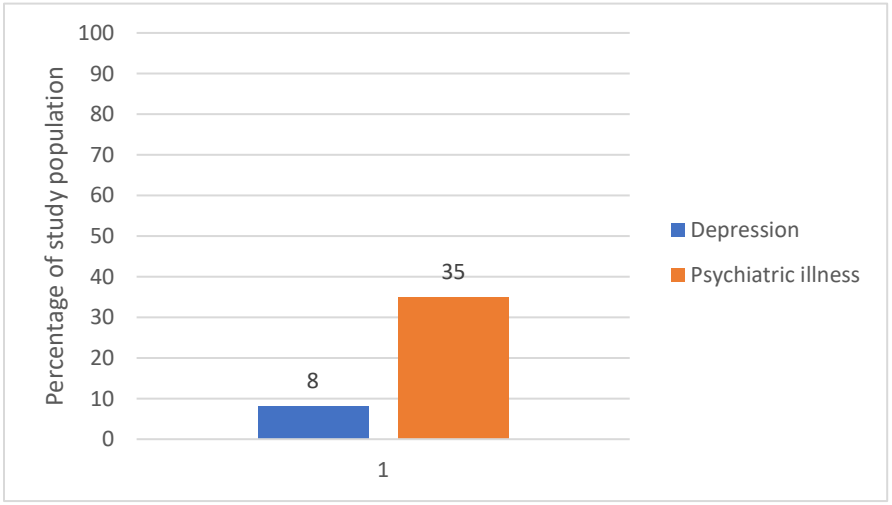


Figure 30 Percentage of Psychiatric illness GHQ12(N=20) and depression PHQ2(N=100) in the study population

As is evident from the above figure, over telephonic interview, the prevalence of depression using the screening tool is low, however when the patients returned for detailed interview

and assessment, the prevalence was higher at 35 %. This might be a more accurate estimate of the prevalence in the study group as the patients might have been reluctant to report depressive symptoms over telephone. The face to face interview data is more reliable than the telephonic interview as the relatives/friends or even the patients themselves might not be comfortable about giving information over the telephone.

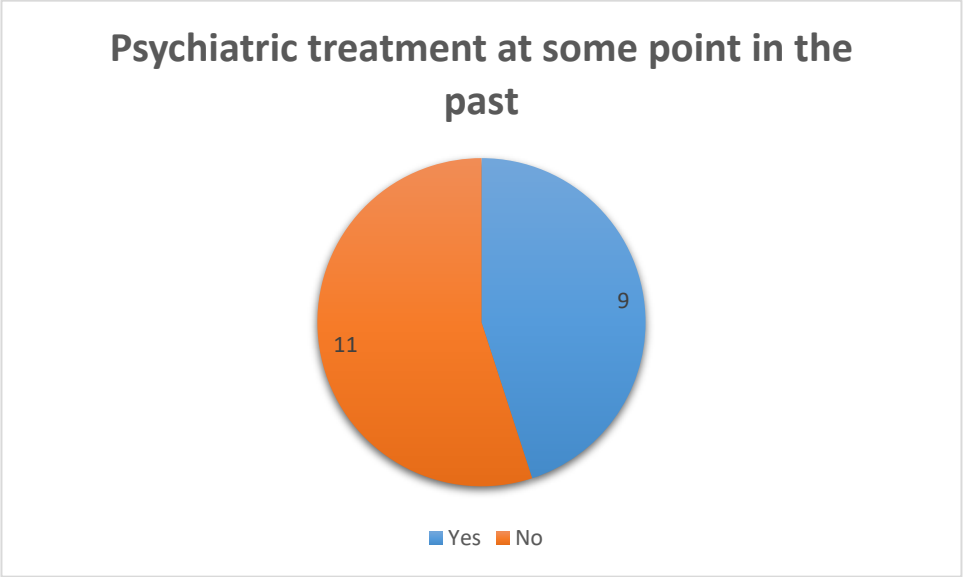


Figure 31 Psychiatric treatment at some point in the past (N=20)

9 patients out of the 20 who had followed up had psychiatric treatment at some point in the past. This was apart from any immediate follow up and treatment under the psychiatry department of the hospital after the index attempt.

REPEAT ATTEMPTS AT DELIBERATE SELF-HARM

Among the patients who were contacted over telephone, 4 had reattempted deliberate self-harm and had died as a direct result of the same. None of the other patients reported any repeat self-harm following the initial attempt.

Among the patients who had reviewed for assessment, none reported any repeat attempts at deliberate self-harm. The interview data is more reliable than the telephonic interview as the relatives/friends or even the patients themselves might not be comfortable about giving information over the telephone.

SOCIAL ISSUES

RESOLUTION OF INITIAL STRESSOR

At the time of initial admission, data regarding the stressors which led to the self-harm was available. The commonest cited reason was relationship issues. Other stressors were psychiatric illness, financial burden, occupation related problems, problems related to peers at school or college and health related issues. At the time of detailed interview, the patients were asked whether these stressors were resolved.

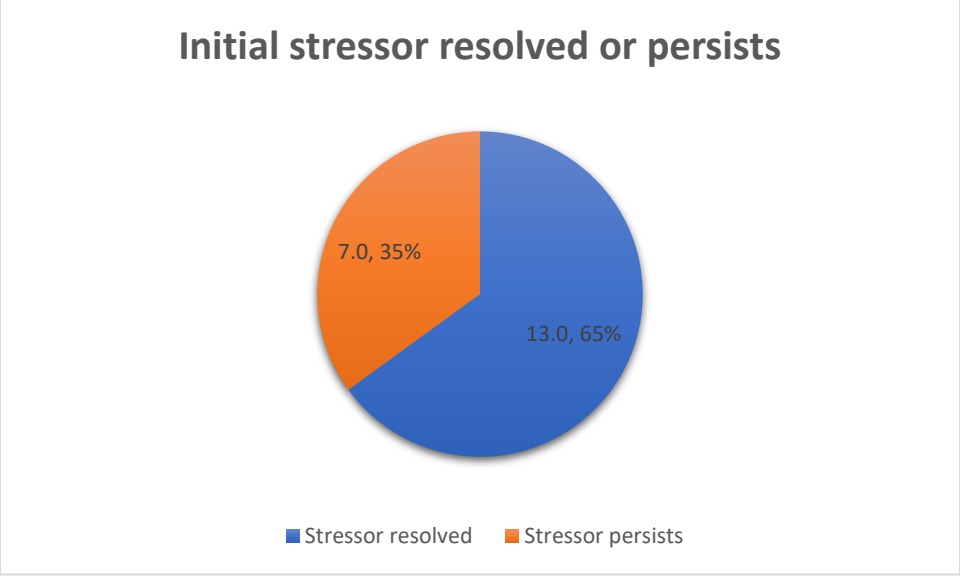


Figure 32 Resolution of initial stressor at the time of follow up(N=20)

Among those who reviewed 7 (35%) patients had a persistent stressor. They had learnt to adapt having some coping mechanism or other to counter the stressor.

Stressor	Number of patients
Relationship problems	2
Financial burden	2
Psychiatric illness	1
Others	2

Table 18 Unresolved stressors at follow up (N=20)

COPING MECHANISM AT REVIEW

The coping mechanisms in place were mostly family or institutional (Psychiatry clinic at CMC or elsewhere). None of the review patients had friends or social workers as coping mechanisms

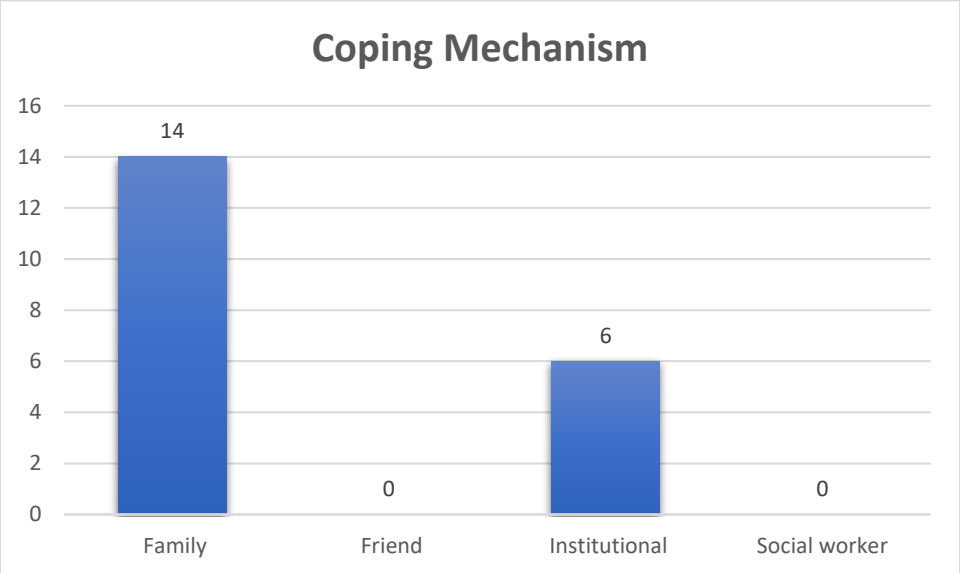


Figure 33 Coping mechanism at the time of review for detailed assessment(N=20)

SOCIAL SUPPORT

The patients who reviewed were mostly living with some family, except one patient who did not have any close family. She was being supported by a religious association.

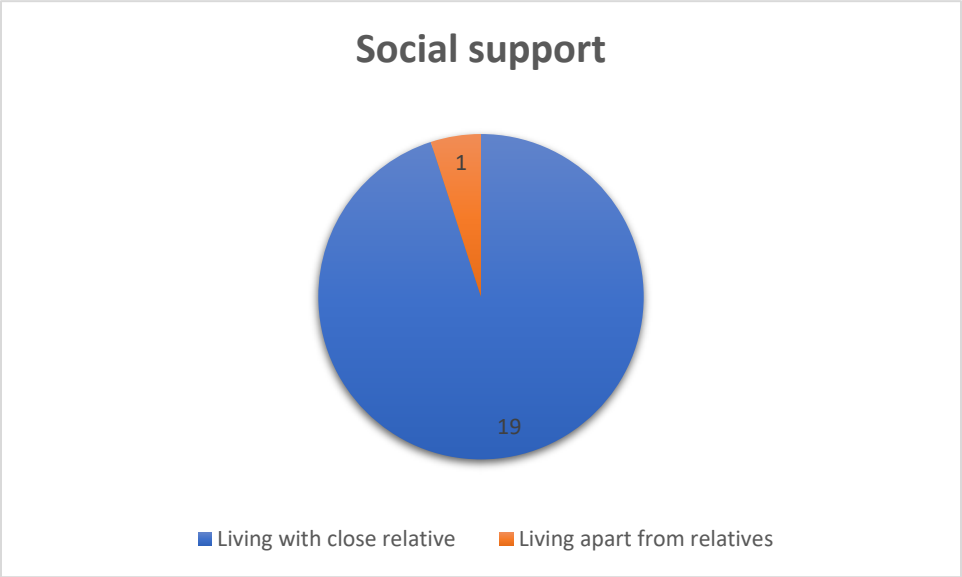


Figure 34 Social support at review (N=20)

PERSISTENT SUICIDAL IDEATION

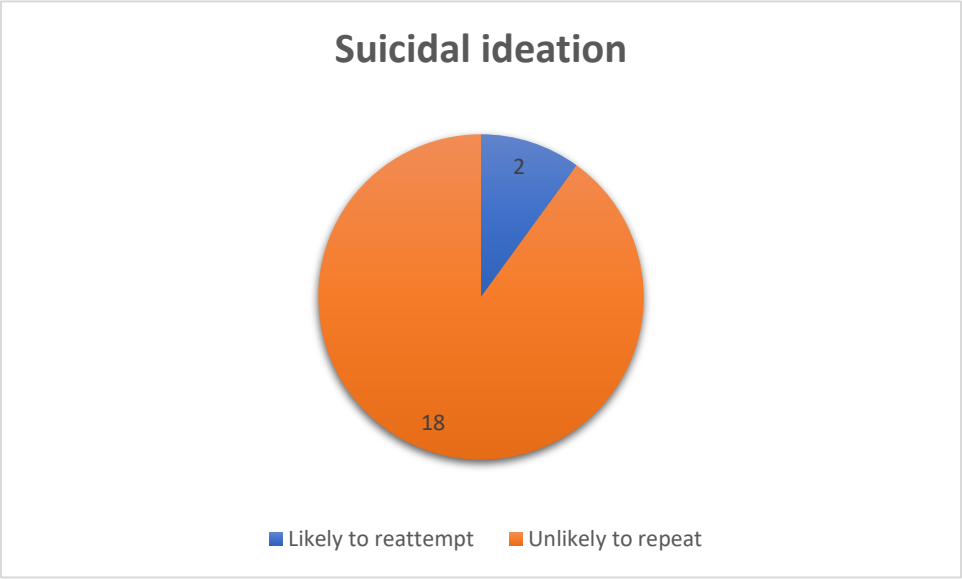


Figure 35 Persistent suicidal tendencies at review

The patients who reviewed were asked whether they were thinking about repeating the deliberate self-harm. Among 20, 2 patients replied that they are likely to repeat deliberate self-harm in the future. The remaining 18 denied any persistent suicidal tendencies. The patients who had suicidal tendencies were strongly suggested to review with psychiatry and were referred for follow-up.

LABORATORY INVESTIGATIONS

Fasting glucose	Post prandial glucose
85	89
104	115
83	90
107	148
81	109
368	506
90	89
88	147
89	96
91	80
134	260
92	108
103	96
81	76
88	84

Table 19 The blood sugar values of those who reviewed (N=20)

One patient was already a known diabetic but was on irregular medications and follow up. A young male patient was newly diagnosed to be diabetic and started on treatment. The same patient had grossly deranged serum triglyceride levels of 1160 mg/dL.

Creatinine, TSH, ESR, CRP was normal in all patients who were evaluated for the same. The vitamin D levels were low in all 3 patients who were evaluated for the same.

One patient had pallor clinically had a haemoglobin value of 10.2 g/dL.

Urinalysis showed microscopic haematuria in one patient, however they did not wish for further evaluation for the same. The young patient with newly detected diabetes had microalbuminuria (68 mg/g) and glycosuria.

One patient had short PR interval on ECG with no other features to suggest a pre-excitation syndrome. They were referred to review in cardiac electrophysiology clinic for further evaluation.

IMPRESSIONS FROM THE INTERVIEW

The patients who came for the interview were a varied group. However, most of them did not appear in a form of distress at the time. They had mostly settled into normal life, had gotten married, had attained gainful employment and were generally satisfied with the quality of life.

Some of the patients had come to the interview with their spouses or children. Many of them were delighted that the hospital was taking initiative in following them up.

None of the patients reported being ostracized by family or society. On the contrary, it was the family which was the major coping mechanism in those whom the stressor persisted.

Two cases who had persistent problems are highlighted below:

Case 1:

One patient alone was visibly depressed, not forthcoming with his responses and was reluctant to get investigations done. This patient had multiple attempts at self-harm in the past, was a chronic alcohol consumer and had significant sensorimotor neuropathy. He did not own a mobile phone and was generally socially withdrawn.

Case 2

One patient did not have much social support. She had been diagnosed with papillary carcinoma thyroid and was on suppressive doses of thyroxine. Her thyroglobulin levels were normal. She was being supported by a group of nuns with no immediate family support. She was unemployed.

DISCUSSION

DEMOGRAPHICS AND BASELINE

The mean age of the study group was 34 and there was a wide representation from all age groups from 19 years of age to 69 years of age. However most of the patients were in the younger age group with more than a quarter of the group less than 40 years of age. The sex ratio was 0.88. Most of the information was from a close relative or a friend who would have brought the patient to hospital during the time of the index attempt which was a limitation of the study.

During the index episode of deliberate self-harm, organophosphorus was the preferred poison of nearly half the population. Our society being primarily agrarian has access to

pesticides readily. This might explain the prevalence of its use as a method of suicide.(30–32)

Most of the patients (75%) attempted deliberate self-harm as an impulsive act. This is the case in existing literature with the rates of self-harm repetition being low.(41,42) There was no planning, deliberation or isolation in many of the cases. An acute stressor led them to the drastic step which most of them regretted once they were in the hospital, surrounded by relatives and friends. The stressor in most patients was relationship issues. Financial burden, occupation-related problems and psychiatric illness was less common. Previous studies from our center have found the following risk factors. Rajkumar et al studied the relationship between suicide and macroeconomic factors including unemployment, literacy, consumer price index, inflation and GDP. They found that incomplete public data on economic indices in India hampered their study. They concluded that suicide is a complex phenomenon resulting from many factors in the individual, and the interaction with their environment.(62) Manoranjitham et al found that 37% of those who died by suicide had a psychiatric diagnosis of which the commonest were alcohol dependence and adjustment disorder.(63) Prasad et al found that chronic stress was one of the commonest risk factors for suicide.(64) According to NCRB, hanging is the commonest method of self-harm used in India, followed by poisoning. As compared to existing literature, the methods of poisoning in our study was similar to what has been described. The predominant method is organophosphorus poisoning in Indian studies.(30–32) In our study too, organophosphorus was the commonest method. Multiple studies done in Western

populations show a higher rate of repeat self-harm and higher rate of psychiatric illness. (26,40,41,65,66) In the Indian population, however, the rate of repeat suicide is low as is evidenced by our data. This is likely due to the impulsive nature of the act.

Nearly half of the study group was unemployed at baseline.

COMPARISON TO THE LARGER COHORT

The overall profile of poisonings from the period 2009-2014 is as follows: The commonest poison was pesticides including organophosphorus, carbamates and pyrethroids (50.7%) followed by prescription drug overdose (27.3%), plant poisons (9.7%), rodenticide (4.4%), corrosive (4%), mixed (0.8%) and unknown (0.8%). This poison profile was similar to our study group which had organophosphorus (42%), prescription medication overdose (24%), pyrethroids (14%), oleander (8%), oduvanthalai (4%) and others.

The mean age was 30.47(12.23) with a range of 14 - 90 years which was similar to the mean age of our study group (34 years). Almost half the population belonged to the age group of 20-29 years. 81% were less than 40 years of age.

There was a slight male predominance (52%) among the cohort. This was also similar to our study group with the percentage of males being slightly higher at 53%. Therefore, the profile of 100 patients in our study is similar to 2323 patients who were admitted during the same time period.

PRIMARY OBJECTIVES

The objectives were to assess the physical health, financial, psychological and social outcomes of patients who presented with deliberate self-harm by poisoning.

PHYSICAL HEALTH ISSUES

Many of the patients reported multiple new symptoms at the time of review. The organophosphorus group had multiple symptom complexes including hoarseness of voice, numbness/tingling, dysphagia, odynophagia and difficulties in executive functions. 85% of the patients reported new symptoms following the index self-harm episode.

Paraesthesia was a common issue among patients. However most had normal sensory examination. Whether this amounted to small fibre sensory neuropathy is doubtful.

A total of 7 patients had objective neurological abnormalities on examination. This included symmetrical motor polyneuropathy, asymmetric sensorimotor polyneuropathy, mononeuritis multiplex, lumbosacral radiculopathy and probable early cognitive decline.

Two patients had palpable thrill over the trachea and one had stridor. All of them had consumed organophosphorus at index self-harm. One patient had hepatomegaly with no evidence of any hepatic dysfunction or chronic liver disease, lymphoproliferative disorder or malignancy.

Among the twenty patients who reviewed for detailed assessment, 9 had comorbid illness including diabetes, COPD, bronchial asthma, Purple glove syndrome, hypertension, traumatic brain injury sequelae and papillary carcinoma thyroid.

Laboratory investigations revealed hyperglycemia in 2 patients. One of them was known to have diabetes, the other patient was diagnosed during this follow up. The same patient had markedly elevated serum triglyceride levels. They were started on therapy for the same. The other laboratory investigations were mostly within normal limits. No patient had elevated creatinine, ECG abnormalities or hypothyroidism.

Overall, the patients were in good physical health. There were very few complications and morbidity associated with poisoning. The few syndromes which could be associated with specific poisons were an asymmetric neuropathy and radiculopathy with organophosphorus poisoning, chronic pain with organophosphorus and drug overdose, non-specific numbness and tingling which was associated with organophosphorus again. Hoarseness of voice, dysphagia and odynophagia together were seen in 30% of patients, most commonly in the organophosphorus group. Stridor and thrill over trachea were seen in patients who had been intubated following organophosphorus poisoning.

HEALTH SEEKING BEHAVIOUR

The health seeking behaviour of patients had not changed. Only 17% of patients had visited a healthcare center in the year prior to the follow up. At the time of baseline evaluation, 15% of patients had a previous healthcare visit. There was not much change in the health seeking behaviour in the patients following the episode of deliberate self-harm. This might indicate that the patients did not have any medical condition serious enough to warrant a visit to a health practitioner.

Conclusion: Poisoning is associated with low rates of physical morbidity requiring long term health care.

OCCUPATION AND EDUCATION

At the time of review only 32% were unemployed as compared to 42% of whom were unemployed at baseline. The percentage at baseline of unemployment could have been much higher as the data was incomplete. Most people were involved in manual labour either skilled or unskilled and only very few were from the higher socioeconomic strata. A higher prevalence of deliberate self-harm in the lower socioeconomic strata might be multifactorial, including education, social support, family support and occupation-related problems.

Many people underwent a change of profession including those who were unemployed at baseline finding employment at review. Among the unemployed, 20 people had a job at review while 24 remained unemployed. All people who were engaged in semiskilled labour had a profession or semi-professional occupation at review.

At the time of follow up, most patients fell into the category of high school education up to tenth grade. Nearly one-fifth had obtained a diploma. Very few had done professional courses and one-tenth were graduates. The illiterate comprised ten percent of the study group.

Conclusion: The poisoning episode did not impair peoples' capacity to work. A large proportion had an upward mobility in the nature of job. 45% of those initially unemployed

had obtained gainful employment. The majority of people were able to financially support themselves, their families and contribute to society.

FINANCIAL STATUS

Nearly half of the patients had reported financial difficulties. Among them 2% were in debt. As we did not have baseline data regarding the same, we could not assess the change which had come about.

Though more than 50% of the patients at follow up reported no financial difficulty, this data must be interpreted cautiously. Telephonic interview is not an ideal tool to assess financial status as most patients would be reluctant to divulge such information. However, those who reported difficulty had perceived financial problems. Among those who reported no financial difficulty we expect that a considerable number would be struggling. Hence the actual financial status might be poorer than the data would suggest.

The patients who came to us were from different socioeconomic strata from unemployed youth, to manual labourers, to students, professionals and businesspeople. However most of the population were unskilled, semiskilled or skilled labourers. It might be assumed that the financial status of these individuals would be lower middle class at best and below the poverty line at worst. The milieu of financial difficulty which might have contributed to the environment where suicidal ideation developed has persisted in a sizeable number of people.

Conclusion: Half the persons had perceived financial difficulties which is consistent with the occupation profile where the majority of persons were unemployed or working in the unorganised sector as labourers.

MARRIAGE AND RELATIONSHIP ISSUES

At follow up, 86% of the study group were married, 11% were single and 1% were divorced. In general, most patients who were single, became married at the time of follow up. The proportion who were married increased from 65% to 86% at follow up as compared to baseline. Many patients who were young and unmarried at the time of index self-harm, at review had gotten married. A person who was separated from spouse at baseline remained separated. The separation from spouse had been cited as the main stressor for the index self-harm episode. At review, the stressor had not resolved, however, the patient had learnt to cope with the circumstances.

Another point to note was that most patients cited relationship issues as the main stressor for the index attempt.

Conclusion: The majority of persons who were unmarried before the episode of self-harm got married during the follow-up period.

ALCOHOL CONSUMPTION AND SUBSTANCE ABUSE

Baseline evaluation showed documented alcohol dependence of only 9%. At the time of follow up, 15% consumed alcohol on a regular basis. Among those who appeared for

detailed evaluation, 3 consumed alcohol on a regular basis. Two patients drank in moderation and one had hazardous pattern of alcohol consumption as evidenced by a high AUDIT questionnaire score.

No patients reported other substance abuse in the telephonic interview nor detailed interview.

Conclusion: There was low rate of problem drinking and alcohol dependence syndrome at follow up.

DEPRESSION AND PSYCHIATRIC ILLNESS

Two screening tools were used to assess depression and psychiatric illness. Over the telephonic interview, the PHQ2 questionnaire, showed 8% of respondents as having a score of 3 or more. However, the source of information was not the patient in most cases. Even when the patient was the respondent, the data given over telephone might not be wholly reliable. The GHQ12 questionnaire administered in person to each patient who reviewed for detailed assessment is more likely to have been more reliable data. 7 out of 20 patients (35%) had a score above 3 indicating a possible underlying psychiatric illness including depression. This is more likely to be representative of the cohort of deliberate self-harm patients as a higher proportion of psychiatric illness was expected in them as compared to the general population. Eight percent of those who followed up were on psychiatric medications.

65% of the patients had resolution of the initial stressor present at the first deliberate self-harm attempt.

Conclusion: The follow up data shows the majority of persons followed up did not develop psychopathology. In about one-third of patients there was likely to be an underlying psychiatric illness including depression. This is consistent with the evaluation of the index episode being an impulsive episode. In the greater proportion to the precipitating stressor resolved at follow up.

REPEAT SELF-HARM AND MORTALITY

Among those who were followed up over the telephonic interview, 4 patients had repeated deliberate self-harm and had died because of the same. None of the other patients reported any further attempts at repeat deliberate self-harm. However, this low incidence of repeat self-harm is questionable due to the likely reluctance of patients or relatives to reveal such sensitive information over a telephonic interview. In total, there were 5 deaths, 4 due to repeat self-harm and 1 due to other causes.

Conclusion: The rate of repeated deliberate self- harm and completed suicide was 4%.

OTHER OBSERVATIONS

Those who were in debt had consumed organophosphorus or pyrethroid at index attempt. All those who had consumed oduvanthalai had reported financial difficulty. The patients with drug overdose at index admission had the highest GHQ12 scores indicating a psychiatric illness. The patients who had consumed organophosphorus at index attempt generally complained of more new-onset symptoms at review as compared to the other poison groups.

There was no significant association between marital status or financial status and alcohol dependence or marital status and psychiatric illness. Those who were in intensive care during index admission were significantly more likely to have neurological abnormalities at follow up.

DELIBERATE SELF-HARM AS A SOCIO-CULTURAL ILLNESS

The overall results show that the long-term outcome of deliberate self-harm is good with low physical morbidity good psychological and social outcomes and low rates of repeat attempt. The impulsive episode is primarily precipitated by social stressors with only about one third of patients have depressive illness suggesting that deliberate self-harm could be regarded as coping mechanism for dealing with stress or a ‘cry for help’. It is a disease occurring in the social milieu of lower socioeconomic status, less educational opportunity, financial and relationship issues and hence could be regarded as a social-cultural illness, closely linked to social and economic circumstances. Although patients return to the same social and economic circumstance the precipitating stressor usually resolves, the family provides social supports, the individual learns to cope and the likelihood of a repeat attempts is low. The good long term clinical outcome and regaining a productive social life makes a strong case for ensuring universal access to good quality emergency treatment of deliberate self-harm across the health system as a public health intervention. Patients who consume lethal poisons such as pesticide or plant poisoning require good emergency and ICU facilities that may not be available in government hospitals. Parkar et al have shown that limiting the deliberate self-harm to a purely psychiatric illness fails to explain the

environment of risk and vulnerability that motivate suicidal behaviour for many patients. A subset of 44% of patients did not satisfy criteria for an enduring psychiatric disorder. They discuss the concept of social suffering which leads to the decision to commit suicide. They suggest complementary psychiatric and cultural evaluation of all self-harm patients in order to better understand the socio-cultural factors pushing them to suicide.(67)

SUMMARY OF RESULTS

Long term outcomes of patients presented with deliberate self-harm by poisoning.

I. Physical health

a. New physical problems and health seeking behaviour

In the phone interview study, 24% complained of new physical problems but the majority had not sought medical help for this. 15% Sought medical help in the last year. 23% had been admitted after the index episode in CMC.

b. Clinical syndromes

Out of 20 patients who were clinical evaluated, 7 patients had numbness and tingling. 5 patients had clinical findings consistent with peripheral neuropathy. This occurred in relation to different poisonings, OP poisoning (2) carbamazepine (1), phenobarbitone (1) and nitrobenzene (1). One patient had early cognitive impairment following carbamazepine and valproate poisoning. It is not clear if these are related to the direct effect of poisoning or related to the critical illness associated with the poisoning. 3 patients had hoarseness, 2 had dysphagia, 1 had odynophagia and 3 patients had stridor. All these patients had been

intubated or undergone tracheostomy. On follow up the symptoms commonly associated with OP poisoning were tingling and numbness, hoarseness, dysphagia, difficulty in concentrating and generalised body pain.

II. Financial

47% at follow up had expressed financial difficulty and 2% were in debt.

III. Psychological

a. Depression screen

On telephonic interview 8% had PHQ2 score of >3 indicating the presence of depression.

On physical examination, seven out of twenty (35%) had a GHQ score >3 indicating the presence of a psychiatric illness. Nine of the twenty patients had received some psychiatric treatment in the past apart from the index illness. Two patients had persistent suicidal ideation.

b. Alcohol and substance abuse

Out of 20 patients who were examined 3 used alcohol, 2 in moderation and 1 had hazardous use of alcohol. There was no other documented substance use.

c. Stressor

In the telephonic interview study, the most common stressor was due to relationship issues. Psychiatric illness, financial burden, occupation related problems, problems related to peers at school or college and health related issues. In 65% of patients at follow up the initial stressor had resolved.

d. Coping mechanisms

In 14 patients who were clinically followed up had coping mechanisms which were from within the family or an outside institution. 19 patients were living with the family.

III. Social outcomes of patients

a. Marriage

In the telephonic interview study the proportion of persons who were married increased from 65% at the index episode to 86% at follow up. The majority of those who were unmarried at the time of the index episode were married at the time of follow up.

b. Occupation

86% of persons were unemployed or from labouring class at the index episode. 44% were unemployed at the index episode and 30% on follow up. 20 unemployed people became employed. 9 persons had upgrading of occupational class. 24 persons who were initially unemployed continued to be so at follow up.

c. Education

60% had studied in school up to middle or high school, 10% were illiterate and 30% had obtained diploma, graduate course or professional education.

IV. Deliberate self-harm Reattempt and mortality

There was a total of 5% mortality. 4 patients had a repeat attempt of deliberate self-harm all of whom were successful suicides (4%). In the repeat suicide attempts, 3 had significant financial difficulties and associated depressions. None of them had accessed medical care.

CONCLUSIONS

Deliberate self-harm is a turning point in the life of an individual. The stress leading up to the initial attempt was resolved in only 65% of patients. However, the repeat self-harm rate was very low indicating that it is an impulsive act done at the spur of the moment. In general, the patients who were followed up had a good outcome with most of them having integrated effectively into society. Only very few of them were in debt, however almost half reported that they were struggling financially. The financial environment which had been present at the time of initial attempt and which could have been contributory to it, was persistent. Many of them who were single at baseline had gotten married, had completed their education and had found new jobs. Although many of them complained of new onset symptoms, only a few had clinically significant or disabling symptoms. Significant neurological abnormalities including symmetrical motor polyneuropathy, asymmetric sensorimotor polyneuropathy, mononeuritis multiplex, lumbosacral radiculopathy and probable early cognitive decline were seen in review patients. These deficits were disabling in only two patients. Co-morbid illnesses were seen in 9 patients out of 20 who followed up for detailed assessment. A young patient was newly detected to have diabetes mellitus with microalbuminuria and greatly elevated serum triglyceride levels.

Psychiatric illness screen, including depression was seen in 35% of patients who reviewed for detailed assessment. The telephonic interview showed a lower percentage of 8% for depression but was interpreted with caution due to the likelihood of reluctance to report depression over telephone. However, it was higher than that of the general population.

This study shows that the patients who present to our tertiary care center with a diagnosis of deliberate self-harm by poisoning had generally positive outcomes in terms of social, economic, psychological and physical health parameters and that the repeat self-harm incidence was low.

Implications of study:

The impulsive episodes precipitated by acute stressors with low rates of underlying depression occurring in the background of difficulty social, economic and educational circumstances suggest that deliberate self-harm is an acute and reversing illness with a good long term clinical, psychological and social outcome. It is therefore important that we should provide good treatment for deliberate self-harm across the health system as a public health intervention to ensure that patients are able to go back to a socially productive life.

LIMITATIONS

1. The sample size of this study was small as it was a pilot study. Although we aimed at following up all the patients we contacted over phone for detailed interview and examination only 20% finally came for follow up.
2. The baseline data with respect to the factors assessed at follow up was incomplete. In certain areas there were large lacunae which limited our comparison of before and after self-harm parameters.

3. Although selection of patients for telephonic interview was randomised, those who reviewed with us for follow up would have been the patients who had the time and health to come to hospital. Another way to put it would be that only the patients who had health problems would have come for follow up. Either way a selection bias was inevitable for the detailed interview and examination.
4. The information obtained via telephonic interview was mostly from a relative or a friend rather than the patient themselves. Hence the reliability of some of the information like the financial status and PHQ2 screening score for depression might have been exaggerated or underplayed.
5. The study did not have a control arm to compare the indices with a general population which would have given a better idea as to how the deliberate self-harm affected them compared to others.
6. The patients were followed up at various time periods following the self-harm. We tried to stratify the sampling based upon the year of deliberate self-harm to assess patients at different time intervals.

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ANNEXURES

ANNEXURE 1- PATIENT INFORMATION SHEET

We have contacted you as you were admitted with poisoning in CMC Vellore. It may have affected your life in many ways including your health, social, economic and psychological well-being. You are being requested to participate in a study to understand better impact of attempted suicide. We are trying to understand the long-term effects the poisoning might have had on patients. With a better understanding of the issues you are facing today, we will be able to provide better counselling and medical help for specific problems which will benefit you and other who might have similar problems in the future.

If you take part what will you have to do?

If you agree to participate in this study, you will have to attend an interview by a doctor or social worker and answer questions pertaining to your social and economic situation prior to the episode as well as currently, the initial suicide attempt and the repeat attempt if any. No additional or experimental treatment will be given to you as part of this study.

Can you withdraw from this study after it starts?

Your participation in this study is entirely voluntary and you are also free to decide to withdraw permission to participate in this study. If you do so, this will not affect your usual treatment at this hospital in any way.

What will happen if you develop any study related injury?

As this is an observational study which does not involve any new treatment methods or interventions, you are not expected to develop any study related injury.

Will you have to pay for the blood or urine tests?

In order to assess your health status a few blood and/or urine tests will be done which will be free of cost.

What happens after the study is over?

When the entire study is completed the findings will be analyzed and the results will be published in a scientific journal for other doctors to understand and better help their patients.

Will your personal details be kept confidential?

Confidentiality will be maintained at all times. Your identity will not be revealed at any point of time to a third party. The results of this study will be published in a medical journal but you will

not be identified by name in any publication or presentation of results. However, your medical notes may be reviewed by people associated with the study, without your additional permission, should you decide to participate in this study.

If you have any further questions, please ask Dr._____ , Dr. _____ or email: _____

ANNEXURE 2- CONSENT FORM

Study Title: *A follow-up study of the clinical, social and economic impact of deliberate self-harm in patients presenting to a tertiary care centre in South India.*

Study Number:

Participant's name:

Date of Birth / Age (in years):

I/I agree for my

ward_____

_____, son/daughter of _____

(Please tick boxes)

Declare that I/I for my ward have read /have been read to and explained the information sheet provide to me regarding this study and have clarified any doubts that I had. [ ]

I/I for my ward also understand that my participation in this study is entirely voluntary and that I/I for my ward am free to withdraw permission to continue to participate at any time without affecting my usual treatment or my legal rights [ ]

I/I for my ward understand that the study staff and institutional ethics committee members will not need my permission to look at my health records even if I withdraw from the trial. I/I for my ward agree to this access [ ]

I/I for my ward understand that my/my ward's identity will not be revealed in any information released to third parties or published [ ]

I/I for my ward voluntarily agree to take part in this study [ ]

Name:

Signature:

Date:

Name of witness:

Relation to participant:

Date:

ANNEXURE 3– DATA ABSTRACTION FORM

PROFORMA FOR TELEPHONIC INTERVIEW

Serial number:

Name of patient:

Age:

Sex:

Introduction: *"Hello, I am Dr. B calling from CMC Vellore hospital. We are calling as you were admitted with poisoning earlier in CMC. We are conducting a study to assess how the poisoning might have affected your life. Can you spare a few moments to answer a few questions?"*

Name of interviewee:

Relation to patient:

Patient Alive/Deceased:

Marital status (unmarried/married/co-habiting/divorced/separated):

Occupation (Profession/Semiprofessional/Clerical, shopowner, farmer/skilled worker/semiskilled/unskilled/unemployed- Kuppuswamy scale):

Education (Profession/Graduate/Diploma/High school/Middle School/Primary/Illiterate- Kuppuswamy scale):

Financial situation (well-off/struggling/in debt):

No. of health care visits last year:

If deceased:

Mode of death:

Time of death:

MODIFIED PHQ 2 QUESTIONNAIRE:

"I wish to know about how you are feeling generally in your work and daily activities. Do you find that your interest in doing things has come down? Do you feel depressed at any time?"

PHQ. 1999 Pfizer Inc. All rights reserved.	Not at all 0-1 day	Several days 2-6 days	More than half of the days 7-11 days	Nearly every day 12-14 days	N/A Unable to respond
a) Little interest or pleasure in doing things	☐ 0	☐ 1	☐ 2	☐ 3	☐
b) Feeling down, depressed, or hopeless?	☐ 0	☐ 1	☐ 2	☐ 3	☐

Little interest or pleasure in doing things:

Feeling down, depressed or hopeless:

Total score:

If alive:

Any new health problems following the poisoning?

Visited/admitted in hospital Y/N:

Time of suicide:

Mode of suicide:

Call for detailed interview

"We are conducting a free general check-up and assessment for you at the hospital. Will you be interested in coming at a convenient date for the same? The travel expenses will be reimbursed by us."

Can the person come for interview Y/N:

Tentative date of interview:

Tentative time of interview:

BASELINE DATA COLLECTION

Socioeconomic data based on Kuppuswamy scale

Study number:

Name of patient:

Age:

Sex:

Method of index attempt:

Date of index attempt:

Marital status (unmarried/married/co-habiting/divorced/separated):

Occupation (Profession/Semi-professional/Clerical, shop owner, farmer/skilled worker/semiskilled/unskilled/unemployed- Kuppuswamy scale):

Education (Profession/Graduate/Diploma/High school/Middle School/Primary/Illiterate- Kuppuswamy scale):

No. of health care visits per year:

Duration of admission in days:

Index attempt:

Poison consumed at index attempt:

Date of index attempt:

Degree of planning (Well-planned/ impulsive):

Lethality score (The Lethality of Suicide Attempt Rating Scale LSARS II- I to VI):

Isolation y/n:

Stressor if known:

Whether admitted in the ICU/HDU y/n:

Whether patient was intubated y/n:

Whether patient underwent tracheostomy y/n:

Duration on tracheostomy:

Alcohol taken around the time of attempt y/n:

Whether documented alcohol dependence y/n:

Any prior attempt y/n:

Documented Psychiatric illness y/n:

Psychiatric diagnosis:

Previous psychiatric treatment y/n:

Current psychiatric medications y/n:

Any medical co-morbidities?

PROFORMA FOR DETAILED INTERVIEW

Serial number:

Name of patient:

Age:

Sex:

DETAILED INTERVIEW

Socioeconomic assessment

Marital status (unmarried/married/co-habiting/divorced/separated):

Occupation (Profession/Semi-professional/Clerical, shop owner, farmer/skilled worker/semiskilled/unskilled/unemployed- Kuppuswamy scale):

Education (Profession/Graduate/Diploma/High school/Middle School/Primary/Illiterate- Kuppuswamy scale):

Total number of years of education:

No. of health care visits per year:

Repeat attempt Y/N:

Method of repeat attempt:

Date of repeat attempt:

Degree of planning (Well-planned/ impulsive):

Lethality score (The Lethality of Suicide Attempt Rating Scale LSARS II- I to VI):

Isolation y/n:

Stressor:

Alcohol taken around the time of attempt y/n:

Psychological assessment

Alcohol consumption y/n:

Frequency AUDIT questionnaire

1. How often do you have a drink containing alcohol?

(0) Never [Skip to Qs 9-10]

(1) Monthly or less

(2) 2 to 4 times a month

(3) 2 to 3 times a week

(4) 4 or more times a week

2. How many drinks containing alcohol do you have on a typical day when you are drinking?

(0) 1 or 2

(1) 3 or 4

(2) 5 or 6

(3) 7, 8, or 9

(4) 10 or more

3. How often do you have six or more drinks on one occasion?

(0) Never

(1) Less than monthly

(2) Monthly

(3) Weekly

(4) Daily or almost daily

Skip to Questions 9 and 10 if Total Score

for Questions 2 and 3 = 0

4. How often during the last year have you found that you were not able to stop drinking once you had started?

(0) Never

(1) Less than monthly

(2) Monthly

(3) Weekly

(4) Daily or almost daily

5. How often during the last year have you failed to do what was normally expected from you because of drinking?

(0) Never

(1) Less than monthly

(2) Monthly

(3) Weekly

(4) Daily or almost daily

6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?

(0) Never

(1) Less than monthly

(2) Monthly

(3) Weekly

(4) Daily or almost daily

7. How often during the last year have you had a feeling of guilt or remorse after drinking?

(0) Never

(1) Less than monthly

(2) Monthly

(3) Weekly

(4) Daily or almost daily

8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?

(0) Never

(1) Less than monthly

(2) Monthly

(3) Weekly

(4) Daily or almost daily

9. Have you or someone else been injured as a result of your drinking?

(0) No

(2) Yes, but not in the last year

(4) Yes, during the last year

10. Has a relative or friend or a doctor or another

health worker been concerned about your drinking

or suggested you cut down?

(0) No

(2) Yes, but not in the last year

(4) Yes, during the last year

Drug abuse y/n:

Living with a close relative y/n:

Any psychiatric treatment currently or in the past y/n:

Any psychiatric evaluation in the past y/n:

GHQ 12

1. Able to concentrate

2. Loss of sleep over worry

3. Playing a useful part

4. Capable of making decisions

5. Felt constantly under strain

6. Couldn’t overcome difficulties

7. Able to enjoy day-to-day activities

8. Able to face problems

9. Feeling unhappy and depressed

10. Losing confidence

11. Thinking of self as worthless

12. Feeling reasonably happy

TOTAL SCORE OUT OF 12:

What coping mechanism is in place (Family/friend/institutional/Social worker):

Is the initial stressor resolved y/n:

Is he/she likely to attempt the act again y/n:

Clinical assessment

Symptoms if any:

Specific history:

Numbness/tingling/pain in any part of the body:

Weakness of any part of the body(proximal/distal):

Hoarseness of voice:

Difficulty in swallowing:

Pain while swallowing:

Decreased urine output:

Difficulty in concentrating:

Difficulty in performing routine tasks:

Medical conditions:

Any current chronic (> 2months) medical issue y/n:

Did the above play a role in the attempt y/n:

Any co-morbidities (DM/HTN/COPD/DL/CKD/CLD):

Chronic pain anywhere in the body y/n:

Severity of pain from 1-10:

Physical examination:

PR:

BP:

General examination findings:

PICCLE:

Stridor:

Thrill over trachea:

RS:

CVS:

Abdomen:

CNS:

Higher mental functions:

Focused lower Cranial nerve examination:

VII:

VIII:

IX, X:

XI:

XII:

Motor:

Bulk:

Tone:

Power:

Deep tendon reflexes:

Plantars:

Sensory system:

Touch:

Pain:

Temperature:

Vibration sense:

JPS:

Cerebellar signs:

Gait:

Rhomberg's test:

ANNEXURE 4- ETHICS COMMITTEE APPROVAL

OFFICE OF RESEARCH
INSTITUTIONAL REVIEW BOARD (IRB)
CHRISTIAN MEDICAL COLLEGE, VELLORE, INDIA

Dr. B.J. Prashantham, M.A., M.A., Dr. Min (Clinical)
Director, Christian Counseling Center,
Chairperson, Ethics Committee.

Dr. Anna Benjamin Pulimood, M.B.B.S., MD., Ph.D.,
Chairperson, Research Committee & Principal

Dr. Biju George, M.B.B.S., MD., DM.,
Deputy Chairperson,
Secretary, Ethics Committee, IRB
Additional Vice-Principal (Research)

November 17, 2016

Dr. Josh Thomas Georgy,
PG Registrar,
Department of Medicine,
Christian Medical College,
Vellore 632 004.

Sub: **Fluid Research Funding: New Proposal**
A follow-up study of the clinical, socioeconomic and psychological impact of deliberate self-harm by poisoning in patients presenting to a tertiary care center in South India. Dr. Josh Thomas Georgy (Employment Number: 29464), PG registrar, Department of Medicine. Dr. Anand Zachariah Employment Number: 11791Medicine, Dr. Ravikar Ralph, Medicine 1. Dr. Vignesh, Dr. Sowmyuya, Dr. Ronald Carey, Dr. Ramya, Medicine, Dr. KS Jacob, Psychiatry.

Ref: IRB Min No: 10167 [OBSERVE] dated 06.07.2016

Dear Dr. Josh Thomas Georgy,

I enclose the following documents:-

1. Institutional Review Board approval 2. Agreement

Could you please sign the agreement and send it to Dr. Biju George, Addl. Vice Principal (Research), so that the grant money can be released.

With best wishes,

Dr. Biju George
Secretary (Ethics Committee)
Institutional Review Board

Dr. BIJU GEORGE
MBBS., MD., DM.
SECRETARY - (ETHICS COMMITTEE)
Institutional Review Board,
Christian Medical College, Vellore - 632 002.

Cc: Dr. Anand Zachariah, Dept. of Medicine, CMC, Vellore

Ethics Committee Blue, Office of Research, 1st Floor, Carman Block, Christian Medical College, Vellore, Tamil Nadu 632 002
Tel: 0416 – 2284294. 2284202 Fax: 0416 – 2262788, 2284481 E-mail: research@cmcvellore.ac.in

OFFICE OF RESEARCH
INSTITUTIONAL REVIEW BOARD (IRB)
CHRISTIAN MEDICAL COLLEGE, VELLORE, INDIA

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Ref: IRB Min No: 10167 [OBSERVE] dated 06.07.2016

Dear Dr. Josh Thomas Georgy,

The Institutional Review Board (Blue, Research and Ethics Committee) of the Christian Medical College, Vellore, reviewed and discussed your project titled "A follow-up study of the clinical, socioeconomic and psychological impact of deliberate self-harm by poisoning in patients presenting to a tertiary care center in South India" on July 06th 2016.

The Committee reviewed the following documents:

1. IRB Application format
2. Informed Consent Forms
3. Proforma
4. Data Collection forms
5. Questionnaire
6. Cvs of Drs. Ravikar, Ramya, Ronald, Sowmya and Vignesh.
7. No. of documents 1 - 6

The following Institutional Review Board (Blue, Research & Ethics Committee) members were present at the meeting held on July 06th 2016 in the CREST/SACN Conference Room, Christian Medical College, Bagayam, Vellore 632002.

Ethics Committee Blue, Office of Research, 1st Floor, Carman Block, Christian Medical College, Vellore, Tamil Nadu 632 002
Tel: 0416 – 2284294. 2284202 Fax: 0416 – 2262788, 2284481 E-mail: research@cmcvellore.ac.in

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Deputy Chairperson,
Secretary, Ethics Committee, IRB
Additional Vice-Principal (Research)

Name	Qualification	Designation	Affiliation
Dr. Biju George	MBBS, MD, DM	Professor, Haematology, Research), Additional Vice Principal , Deputy Chairperson (Research Committee), Member Secretary (Ethics Committee), IRB, CMC,Vellore	Internal, Clinician
Dr. B. J. Prashantham	MA(Counseling Psychology), MA (Theology), Dr. Min(Clinical Counselling)	Chairperson, Ethics Committee, IRB. Director, Christian Counseling Centre, Vellore	External, Social Scientist
Dr. Jayaprakash Muliyil	BSc, MBBS, MD, MPH, Dr PH (Epid), DMHC	Retired Professor, Vellore	External, Scientist &Epidemiologist
Dr. Denise H. Fleming	BSc (Hons), PhD	Honorary Professor, Clinical Pharmacology, CMC, Vellore	Internal, Scientist & Pharmacologist
Mr. C. Sampath	BSc, BL	Advocate, Vellore	External, Legal Expert
Mr. Samuel Abraham	MA, PGDBA, PGDPM, M. Phil, BL.	Sr. Legal Officer, CMC, Vellore	Internal, Legal Expert
Mrs. Sheela Durai	MSc Nursing	Professor, Medical Surgical Nursing, CMC, Vellore	Internal, Nurse
Dr. Anand Zachariah	MBBS, PhD	Professor, Medicine, CMC, Vellore	Internal, Clinician
Mrs. Pattabiraman	BSc, DSSA	Social Worker, Vellore	External, Lay Person
Ms. Grace Rebekha	M.Sc., (Biostatistics)	Lecturer, Biostatistics, CMC, Vellore	Internal, Statistician
Dr. Balamugesh	MBBS, MD(Int Med), DM, FCCP (USA)	Professor, Pulmonary Medicine, CMC, Vellore	Internal, Clinician
Mrs. Emily Daniel	MSc Nursing	Professor, Medical Surgical Nursing, CMC, Vellore	Internal, Nurse

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Secretary, Ethics Committee, IRB
Additional Vice-Principal (Research)

Dr. Sathish	MBBS, MD, DCH	Professor, Child Health, CMC, Vellore	Internal, Clinician
Dr. Rekha Pai	MSc, P.hd	Internal Basic Scientist, Internal Basic Scientist, CMC, Vellore	External, Legal Expert
Dr. Thomas V Paul	MBBS, MD, DNB, PhD	Professor, Endocrinology, CMC, Vellore	Internal, Clinician
Dr. Rajesh Kannangai	MD, PhD.	Professor, Clinical Virology, CMC, Vellore	Internal, Clinician
Dr. Ranjith K Moorthy	MBBS, MCh	Professor, Neurological Sciences, CMC, Vellore	Internal, Clinician
Dr. Santhanam Sridhar	MBBS, DCH, DNB	Professor, Neonatology, CMC, Vellore	Internal, Clinician

We approve the project to be conducted as presented.

Kindly provide the total number of patients enrolled in your study and the total number of withdrawals for the study entitled: "A follow-up study of the clinical, socioeconomic and psychological impact of deliberate self-harm by poisoning in patients presenting to a tertiary care center in South India" on a monthly basis. Please send copies of this to the Research Office (research@cmcvellore.ac.in).

Fluid Grant Allocation:

A sum of 44,500/- INR (Rupees Forty Four Thousand Five Hundred Only) will be granted for 1 year.

Yours sincerely,

Dr. Biju George
Secretary (Ethics Committee)
Institutional Review Board

Dr. BIJU GEORGE
MBBS., MD., DM.
SECRETARY - (ETHICS COMMITTEE)
Institutional Review Board,
Christian Medical College, Vellore - 632 002.

IRB Min No: 10167 [OBSERVE] dated 06.07.2016 4 of 4

ANNEXURE 5- DATA SET

Serno	hospno	namepat	pntname	name	method	marstat	Prof	educ	healvis	admdur	Dateatt	year1	plannin	lsars	lsol	Stres	icuhdu	intubated	trach
1	""49631	""KALA""	"kala"	"Kala"	1	2	9	9	0	4	08-Jul-09	2009	2	1	9	9	2	2	2
2	""50809	""ROGINI.	"Rogini"		6	1	8	4	3	17	27-Jul-09	2009	2	1	1	5	2	2	2
3	""79133	""WILLIAN	"WILLIAM	"Williams	7	2	6	4	4	7	09-Jul-09	2009	1	2	1	4	1	2	2
4	""61332	""PALANI	"PALANI"		1	2	7	7	0	22	04-Jan-10	2010	2	1	1	3	1	1	1
5	""61631	""SHARMI	"SHARMILA BANU"		7	2	1	2	3	1	13-Jan-10	2010	2	5	2	1	2	2	2
6	""62032	""SANKAR	"SHANKAR"		1	9	9	9	0	12	18-Jan-10	2010	2	1	9	9	1	1	2
7	""62054	""LEELAVA	"LEELAVA	"Leelavath	6	1	9	9	0	5	24-Jan-10	2010	2	1	1	9	2	2	2
8	""62510	""SHANKA	"SHANKAI	"Shankar"	1	9	9	9	0	27	26-Jan-10	2010	2	1	1	3	1	1	1
9	""85304	""NARASH	"NARASHIMALU NAI		1	2	9	9	0	7	03-Jan-11	2011	2	1	9	5	9	9	9
10	""86198	""MANIVA	"MANIVANNAN"		1	9	9	9	0	1	26-Jan-11	2011	2	1	1	9	2	2	2
11	""86856	""MARAG	"MARAGATHAM"		3	2	8	9	0	5	28-Jan-11	2011	2	3	1	1	2	2	2
12	""86857	""THARIKA	"THARIKA	"Tharika S	7	2	9	9	0	4	28-Jan-11	2011	2	5	1	9	2	2	2
13	""86868	""BHARAT	"BHARATHI"		4	2	9	9	0	5	30-Jan-11	2011	1	1	1	9	1	1	2
14	""85303	""PRAGNY	"PRAGUNYABAI"		8	1	8	2	0	10	02-Jan-11	2011	2	4	1	2	1	1	1
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16	""85762	""SUMATH	"SUMATHI"		3	2	8	9	0	5	17-Jan-11	2011	1	1	1	9	2	2	2
17	""86515	""PARTHI	"parthi"		1	1	8	4	0	4	19-Jan-11	2011	2	1	2	2	2	2	2
18	""85316	""USHA S.	"USHA"		1	2	8	9	0	5	06-Jan-11	2011	2	1	9	1	2	2	2
19	""85343	""VENDA"	"VENDA"		1	2	8	9	0	26	09-Jan-11	2011	1	1	1	1	1	1	1
20	""86165	""ARJUN.	"ARJUN"		1	9	9	9	0	4	15-Jan-11	2011	2	1	2	5	2	2	2
21	""10739	""JAYAKU	"JAYAKUMARI"		1	1	8	4	0	17	03-Jan-12	2012	2	1	2	9	1	1	1
22	""11018	""ANBARA	"ANBARASAN"		7	2	6	9	0	2	14-Jan-12	2012	2	5	2	4	2	2	2
23	""11480	""""	"REVATHI"		3	2	2	3	0	8	14-Jan-12	2012	2	1	2	9	2	2	2
24	""11297	""BABU""	"BABU"		1	2	4	9	0	5	20-Jan-12	2012	2	1	1	9	2	2	2
25	""11914	""JYOTHI"	"JYOTHI"		1	2	8	4	0	3	22-Jan-12	2012	2	1	2	1	2	2	2
26	""11924	""NADHIY	"NADHIYA	"NADIYA"	3	2	8	5	0	8	23-Jan-12	2012	2	1	2	1	2	2	2
27	""12607	""ESWARI	"ESWARI"	"ESWARI K	7	2	8	4	0	2	31-Jan-12	2012	2	4	2	1	2	2	2
28	""12759	""TUFAIL A	"THUFAIL	ABBAS"	7	2	9	9	0	6	31-Jan-12	2012	2	4	2	4	1	1	2
29	""12616	""RANI G"	"RANI"		7	2	8	4	2	3	########	2012	2	5	2	1	2	2	2
30	""12646	""CHARAN	"CHARAN V"		5	1	8	9	0	2	########	2012	2	4	2	5	2	2	2
31	""12656	""RAVI TE	"RAVI TEJA"		7	1	9	9	0	3	########	2012	2	4	9	9	2	2	2
32	""13301	""NATARA	"NATARAJAN"		1	2	8	7	0	2	########	2012	2	1	2	9	2	2	2
33	""13307	""SARIDH	"SARIDHA"		3	2	8	9	0	8	########	2012	2	1	1	5	2	2	2
34	""13330	""BHUVAN	"BHUVAN	"Bhuvane	6	2	8	7	0	2	########	2012	2	3	2	4	2	2	2
35	""13523	""MAGESH	"MAGESWARY"		1	2	8	4	0	2	########	2012	2	1	2	9	2	2	2
36	""02050	""GANDHI	"GANDHIM	"Gandhim	7	1	7	3	2	2	########	2012	2	5	2	9	2	2	2
37	""13859	""JAYALA	"JAYALAK	"Jayalaksh	9	2	8	9	1	16	########	2012	2	1	2	9	1	1	2
38	""13355	""RAMESH	"RAMESH"		1	1	9	9	0	5	########	2012	2	1	2	9	1	1	2
39	""13630	""PARIMA	"PARIMALA"		2	2	8	9	0	5	########	2012	1	1	1	4	2	2	2
40	""38402	""ANNAM	"ANNAMMA"		3	2	8	7	0	4	08-Jan-13	2013	1	1	1	1	2	2	2
41	""38950	""SUNIL K	"SUNILKUMAR"		1	1	9	9	3	26	24-Jan-13	2013	1	1	1	5	1	1	1
42	""38407	""UDHAYA	"UDHAYAKUMAR"		1	1	9	9	0	27	08-Jan-13	2013	1	1	1	5	1	1	1
43	""38432	""LAKSHM	"LAKSHMANAN"		1	2	8	7	0	33	12-Jan-12	2012	1	1	2	2	1	1	2
44	""38915	""MUNISV	"MUNNISWAMI"		1	2	9	9	0	8	18-Jan-13	2013	1	1	1	9	1	1	2
45	""40149	""SARAVA	"SARAVAN	"SARAVAI	1	2	3	9	0	5	########	2013	1	1	2	1	2	2	2
46	""40663	""Gayathr	"GAYATHI	"Gayathri"	7	2	8	9	0	11	########	2013	2	4	1	1	1	1	2
47	""41541	""POONK	"POONGODI"		1	2	8	9	0	7	########	2013	1	1	1	1	2	2	2
48	""40166	""MANJUL	"MANJULA"		1	2	8	9	0	13	########	2013	2	1	2	9	1	1	1
49	""75109	""NALINA	"NALINA"		7	2	8	9	0	5	01-Jan-14	2014	2	5	2	1	2	2	2
50	""21861	""BASKAR	"BHASKAR"		5	2	9	9	0	6	25-Jan-14	2014	2	1	1	5	2	1	2
51	""75390	""SRI RAM	"SRIRAM"	"SRI RAM	7	1	8	4	0	3	29-Jan-14	2014	2	5	1	4	2	2	2
52	""75417	""MUGILA	"MUGILAN"		7	1	6	4	0	2	########	2014	2	6	2	9	2	2	2
53	""75417	""INDUMA	"INDUMA	"INDUMA	7	2	8	9	0	3	03-Jan-14	2014	2	5	2	5	2	2	2
54	""75602	""MANJUL	"MANJULA"		5	2	8	9	1	2	########	2014	2	1	2	9	2	2	2
55	""75626	""HEMALA	"HEMALA	"HEMALA	7	5	8	4	2	3	########	2014	2	4	2	4	2	2	2
56	""27054	""KANTHA	"KANTHA"		7	1	1	3	4	4	########	2014	2	5	2	1	2	2	2
57	""80431	""PADMA	"PADMA"		6	2	8	7	0	6	########	2014	2	2	1	1	2	2	2
58	""75679	""PALANII	"PALANINATHAN"		7	2	7	6	0	12	########	2014	2	5	2	5	2	2	2
59	""75947	""KALPAN	"KALPANA"		7	2	8	5	0	5	########	2014	2	3	1	1	2	2	2
60	""90228	""MONESI	"MONISH	"MONESH	7	1	8	4	3	2	#NULL!	2014	1	1	1	4	2	2	2
61	""90153	""CHANDI	"CHANDIRA"		2	2	8	7	0	8	########	2014	1	1	1	3	2	2	2
62	""90278	""ARUNA	"ARUNA"	"ARUNA V	7	1	8	9	0	5	########	2014	2	4	2	5	2	2	2
63	""90229	""ANJALA	"ANJALA"		3	2	8	7	0	3	########	2014	1	1	1	1	2	2	2
64	""90291	""KATHIC	"KATHICK"		2	1	8	4	0	12	########	2014	2	1	2	1	1	2	2
65	""90953	""MEERA.	"MEERA T"		7	1	1	2	2	4	########	2014	2	6	2	1	2	2	2
66	""97126	""NIRMAL	"NIRMALA DEVI"		5	1	9	9	0	10	26-Jun-11	2011	2	1	1	1	1	1	2
67	""96271	""ELUMAL	"ELUMALAI"		5	9	9	9	0	4	20-Jun-11	2011	2	1	9	9	2	2	2
68	""10225	""KARTHI	"KARTHIKA"		5	1	9	9	0	2	########	2011	2	1	2	1	2	2	2
69	""07491	""SUJETH	"SUJETHA PRIYADAR		5	9	9	9	0	2	########	2011	2	1	2	9	2	2	2
70	""09472	""GOPI.K.	"GOPI"		5	1	8	4	0	1	########	2011	2	1	2	1	2	2	2
71	""40627	""UTHAMI	"UTHAMAN"		1	2	4	7	0	5	########	2013	1	1	1	9	2	2	2
72	""40139	""JAGADIS	"JAGADEESH"		1	1	6	4	1	14	########	2013	1	1	1	3	1	1	1
73	""40111	""VIJAY V.	"VIJAY"		1	1	9	9	0	12	########	2013	2	1	1	9	1	1	2
74	""40129	""AYYAPP	"AYYAPPAN"		1	2	9	4	0	4	########	2013	1	1	1	3	2	2	2
75	""40125	""BALASU	"BALASUBRAMANIA		1	2	5	4	0	15	11-Jan-13	2013	2	1	1	9	1	2	2
76	""40111	""SHEEBA.	"SHEEBA"		7	2	8	4	1	3	########	2013	2	6	2	1	2	2	2
77	""08952	""SANKAR	"SANKAR G."		5	2	9	9	0	8	########	2011	1	1	2	1	1	1	2
78	""78033	""ELUMAL	"ELUMALAI C."		5	2	9	9	0	4	########	2010	2	2	2	9	1	1	2
79	""87501	""SAMBAS	"SAMBASIVAM V"		5	2	4	9	0	4	########	2011	2	1	1	1	2	2	2
80	""74775	""SURESH.	"SURESH.S"		5	2	8	5	0	6	29-Jul-10	2010	2	4	2	3	1	1	2
81	""88885	""RAVI R."	"RAVI R."		1	2	9	9	0	13	########	2011	2	1	1	9	1	1	1
82	""89563	""ELUMAL	"ELUMALAI A."		5	1	9	9	0	6	########	2011	2	1	1	9	1	1	2
83	""99908	""KALPAN	"KALPANA	"KALPANA	1	2	8	5	0	22	########	2011	2	1	1	9	1	1	1
84	""92224	""MUTHAI	"MUTHAMMAL.G"		7	2	8	9	0	3	########	2014	2	4	1	1	2	2	2
85	""90993	""SIVA KU	"Sivakumar"		1	1	7	7	0	15	12-Jun-14	2014	2	1	1	1	1	1	1
86	""91587	""ASHA T.	"ASHA T"	"Asha"	1	1	9	9	0	28	########	2014	1	1	1	5	1	1	1
87	""40120	""JAYAPR	"JAYAPRAKASH"		1	2	9	9	0	5	########	2013	2	1	1	5	2	2	2
88	""40110	""SASI KU	"SASI KUMAR M"		1	2	9	9	0	6	########	2013	1	1	1	9	2	2	2
89	""40117	""EGAMBA	"EGAMBARAM E"		1	2	4	1	0	5	########	2013	1	1	1	1	2	2	2
90	""41527	""RAMARA	"RAMARAJ R."		7	1	8	4	3	6	20-Jun-13	2013	2	2	1	4	1	1	2
91	""42270	""VALTER	"VALTER V	"Valter Va	2	1	8	4	0	5	########	2013	1	1	1	1	2	2	2
92	""42248	""RAJA T."	"RAJA T."		1	2	9	9	0	6	########	2013	2	1	1	9	2	2	2
93	""42257	""INDRA""	"INDRA"		1	2	8	7	0	19	########	2013	1	1	1	9	1	1	1
94	""42253	""MANJUL	"MANJULA M."		8	2	8	4	0	18	########	2013	1	1	1	1	1	2	1
95	""43450	""KRISHN	"KRISHNAN"		5	2	4	9	0	3	########	2013	2	4	1	1	2	2	2
96	""42268	""BABU C.	"BABU C."		1	2	8	4	0	3	########	2013	2	1	1	3	2	2	2
97	""15351	""MOHAN	"MOHAN KUMAR S."		1	2	4	4	0	5	########	2012	2	1	1	1	2	2	2
98	""14783	""RAJESH	"RAJESH M."		3	2	5	3	0	6	########	2012	2	1	1	9	2	2	2
99	""14796	""MALAR	"MALAR M."		1	2	5	5	0	6	########	2012	2	1	2	5	1	1	2
100	""14797	""KUMAR	"KUMAR"		1	2	5	5	0	7	########	2012	2	1	2	5	1	1	2

ANNEXURE 6- SUPPLEMENTARY CHARTS AND GRAPHS

FOLLOW UP									
BASELINE	Profession	Semi-professional	Shop owner	Farmer	Skilled worker	Semiskilled	Unskilled	Unemployed	missing data
Profession	2	0	0	0	1	0	0	0	0
Semi-professional	0	0	0	0	0	0	0	1	0
Shop owner	0	0	0	0	0	1	0	0	0
Farmer	0	0	0	2	2	2	0	0	0
Skilled worker	0	0	0	1	1	0	2	0	0
Semiskilled	3	1	0	0	0	0	0	0	0
Unskilled	0	0	1	0	0	0	0	3	0
Unemployed	2	1	1	0	0	6	10	24	2
Missing data	2	3	0	1	7	6	6	4	2

Table 1. Change in occupation from baseline according to profession(N=100)

Relationship status	Documented alcohol dependance	No alcohol dependance
Married	8(9.3%)	78(90.7%)
Unmarried	1(7.10%)	13(92.90%)

Table 2. Relationship status and alcohol dependence(N=20)

Financial status	Documented alcohol dependence	No alcohol dependence
Well-off	5(10%)	45(90%)
Struggling	4(8%)	46(92%)

Table 3. Financial status and alcohol dependence(N=100)

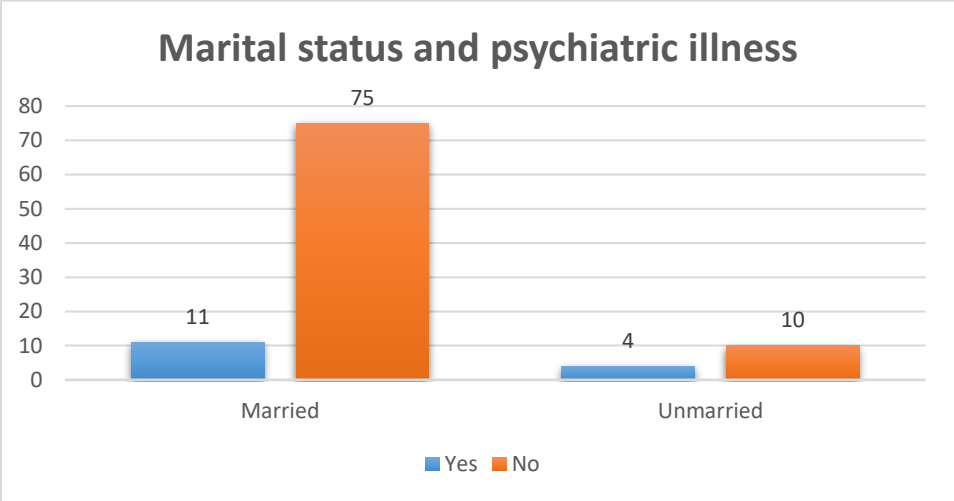

Figure 1. Marital status and psychiatric illness(N=100)

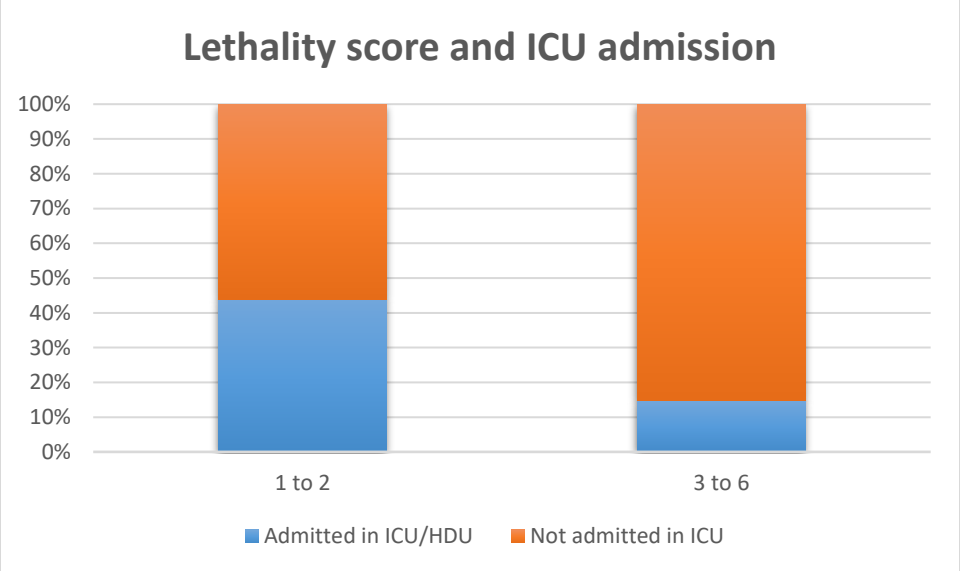

Figure 2. Lethality score (LSARS II) and ICU admission(N=100)

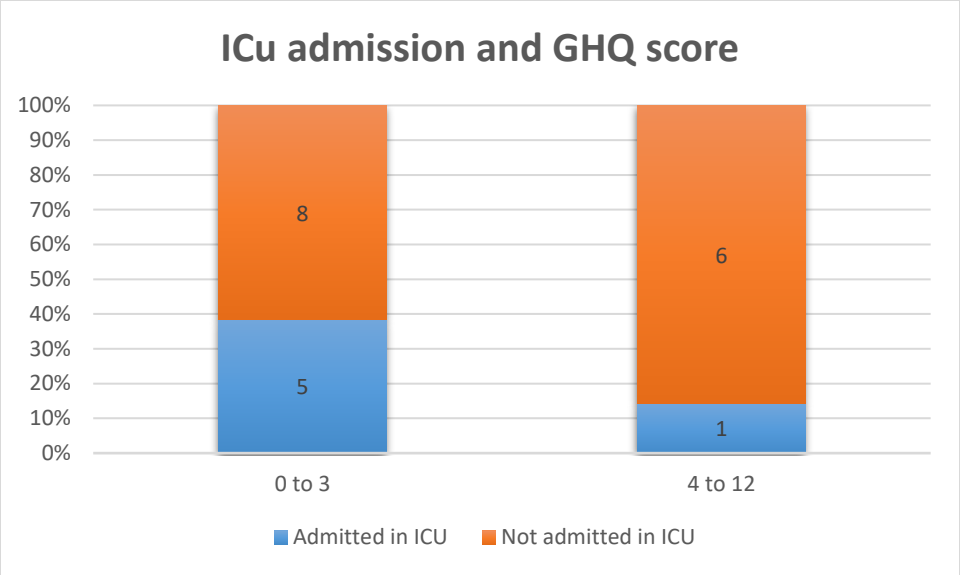

Figure 3. GHQ score and admission in intensive care at index attempt(N=20)