Gender Differences in Risk Factors and Patterns Contributing Towards Deliberate Self-Poisoning

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Abstract

Objective: To determine the gender differences in risk factors and patterns contributing towards deliberate self-poisoning.
Methods: A descriptive study of patients admitted in National Poisoning Control Center Ward-5, Jinnah Post Graduate Medical Center Karachi, was conducted for six months from 1st July 2013 to 1st January 2014. The information was gathered using a questionnaire generated from World Health Organization, International Programme on Chemical Safety's INTOX (WHO IPCS INTOX) recording format for toxic exposure the data was analyzed on package SPSS version 14.0. The results were obtained in numbers and percentages. The Chi-square test was used for statistical differences of risk factors for deliberate self-poisoning in relation to gender. p-values of <0.05 were considered significant.
Results: Out of the 374 patients analyzed during this period the age group most frequent was within the range of 15-74 years, with 61.5% of the subjects being male. No significant age difference was observed between male and female subjects. Single male subjects represented the largest population which attempted deliberate self-poisoning. History of psychiatric illness and drug abuse was more common in male subjects. There was no significant difference in educational status, agent used for Deliberate Self-Poisoning (DSP), number of agents used or route of exposure in the two genders. The agent most commonly used was organophosphate insecticide.
Conclusion: Young single males belonging to low socioeconomic group and having history of psychiatric illness or drug abuse are at greater risk of Deliberate Self-Poisoning (DSP). Preventive strategies need to be directed at this population.

Keywords: Self-Poisoning, Deliberate Self-Harm (DSH), suicide, gender differences.
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Introduction

The last few decades have highlighted the importance of deliberate self-harm in the developing world and it has shown to contribute towards substantial mortality and morbidity[1]. Deliberate Self-Harm (DSH) is an important indicator of suicide in an individual as once a person who has self-harmed has 50-100 times increased likelihood of death by suicide; with 1 in 15 dying by suicide within nine years of their index episode[2]. Understanding and helping people who self-harm is therefore likely to be an important part of an effective suicide prevention strategy[3].

Epidemiological study of risk factors in males and females show that there are important differences in suicidal behavior[4]. Most studies corroborate the finding that males commit suicide three times more often than females but females attempt suicide three times more often than males[5]. There is a lack of local data in the literature and no study has been conducted that discreetly addresses other

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factors including, place of incident, route of exposure, time of attempt and number of agents taken. Hence, we have conducted our study to find out gender differences in different factors and risk factors contributing towards deliberate self-poisoning. The study was carried out on 374 patients.

Patients and Methods

This is a descriptive cross-sectional study. It was conducted prospectively from 1st July 2013 to 1st January 2014, at the National Poisoning Control Centre located in Ward 5, Jinnah Post Graduate Medical Centre, Karachi. The duration of the study was six months. All the patients included in this study, signed the written and informed consent forms.

All of the 374 patients presenting to the accident and emergency department and referred to the National Poisoning Control Centre were included in the study. Deliberate self-poisoning was identified if the act had been deliberate and was done in full knowledge that it was potentially harmful. All patients that signed the consent form and came within the six month duration of the study were included after randomized sampling of the required sample size needed to deduce the proportions. We excluded cases of accidental poisoning, homicidal poisoning, accidental drug overdose and poisoning for purpose of theft and burglary. Pediatric cases were also excluded.

The proforma was based on a questionnaire issued by WHO IPCS INTOX project. The International Programme on Chemical Safety (IPCS) INTOX Programme is a global endeavor to promote chemical safety through the establishment and strengthening of poison centres. Other factors were added based on other studies regarding the epidemiology of deliberate self-harm and the gender differences therein. These risk factors included gender, age, marital status, dependents, occupation, employment status, income, educational status. Other factors added to this study to elucidate the complete picture of poisoning patterns were; chemicals taken, place of incidence, route of exposure, time of attempt, number of agents taken, history of physical or psychiatric illness and any history of suicide or deliberate self-harm in the family. The data feeding and analysis was on computer package SPSS version 14.0. The results were obtained in numbers and percentages. Sampling was done as randomized sampling. The sample size was calculated for the proportion. As the motive of this study was to address the lack of data on pattern and risk factors the variance was taken to maximum (i.e 0.25). The sample size was calculated with the Wald's method for the binomial distribution and confidence level was set to >95%. The Chi-square test was used for statistical difference of risk factors for deliberate self-poisoning in relation to gender. p-values of <0.05 were considered significant.

Results

A total of 374 patients admitted to the National Poisoning Control Centre, with deliberate self-poisoning, were analyzed. There was a majority of male subjects (n=230, 61.5%) as compared to female subjects (n=144, 38.5%). The age of the subjects ranged from 13 to 70 years and the mean age ± SD was 25 ± 10.1 years. The largest number of patients belonged to the age group of 15-24 years both among males and among females (Table 1). Thus no significant age difference was observed between male and female subjects.

Single male subjects represented the larger group (n=176, 76.5%) compared with single female subjects (n=77, 53.5%) ($p<0.05$). Amongst the married subjects, 67 (46.5%) were females and 44 (23.5%) were males ($p<0.05$). The divorced or separated subjects were exclusively male (n=10, 2.6%). The presence of dependents had a protective effect in both the sexes. No significant difference was observed between the two genders as pertaining to the effect of dependents on incidence of deliberate self-poisoning (Table 1).

Most of the subjects who attempted suicide by poisoning were illiterate (44.3% of males and 39.6% of females). The second most common group re-

Table 1. Deliberate Self-Poisoning in patients admitted to the National Poisoning Control Centre, Karachi.

Patient Characteristics	Number=374	Percentage
Gender		
Male	230	61.5
Female	144	38.5
Age (years)<15	9	2.4
15 - 24	203	54.3
25 - 34	105	28.1
35 - 44	35	9.4
45 - 54	9	2.4
55 & above	13	3.5
Marital status		
Married	111	29.7
Unmarried	253	67.6
Divorced	5	1.3
Separated	5	1.3

Table 2. Socioeconomic risk factors according to gender of patients admitted to the National Poisoning Control Centre, Karachi.

Patient Characteristics n=374	Male (230) No.	%	Female (144) No.	%	p-value
Employment					
Employed	107	46.5	12	8.3	0.001
Unemployed	123	53.5	132	91.7	0.001
Income (Rs/=)					
<10,000	183	79.6	84	58.3	0.001
10,001 -2 0,000	41	17.8	53	36.8	0.001
> 20000	6	2.6	7	4.9	0.247
Education					
Illiterate	102	44.3	57	39.6	
Primary	74	32.2	42	29.2	
Secondary	42	18.3	34	23.6	0.536
Graduate	10	4.4	10	6.9	
Postgraduate	2	0.8	1	0.7	

Table 3. Characteristics of poison with relation to gender in patients admitted to the National Poisoning Control Centre, Karachi.

History	Male (230) No.	%	Female (144) No.	%	p-value
Chemical taken					
OPI	95	41.3	79	54.9	0.011
Corrosive	32	14.0	20	13.9	0.994
Drugs	53	23.0	34	23.6	0.899
Others	50	21.7	11	7.6	0.001
Place of Incidence					
Work place	27	11.7	5	3.5	0.005
Home	160	69.6	135	93.8	0.001
Others	43	18.7	4	2.8	0.001
Route of exposure					
Oral	215	93.5	142	98.6	0.020
Skin	4	1.7	2	1.4	-
Inhalation	7	3.0	0	0	-
Parenteral	4	1.7	0	0	-
Time of attempt					
Day	144	62.6	78	54.2	
Night	86	37.46	64	5.8	0.131
Chemical agents					
Single	212	92.2	134	93.1	
Multiple	18	7.8	10	6.9	0.909

Table 4. Psychiatric risk factors according to gender in patients admitted with Deliberate Self Poisoning to the National Poisoning Control Centre, Karachi.

Factor	Male (230) No.	%	Female (144) No.	%	p-value
H/O Psychiatric illness	50	21.7	11	7.6	0.001
H/O Physical illness	8	3.5	7	4.9	0.695
H/O Suicide or Para suicide in family	4	1.7	1	0.7	0.694
History of drug abuse					
Yes	31	17.0	4	2.7	
No	199	83.0	140	97.3	0.001
Number of attempt					
First	210	91.3	132	91.7	
Subsequent	20	8.7	12	8.3	0.720

garding educational status were primary school graduates (32.2% of males and 29.2% of females). Men with a no employment and a lower socioeconomic class were at more risk of attempting suicide as compared to women ($p<0.05$) (Table 2).

There was no difference regarding the chemical taken between the two genders. Organophosphate insecticide being the most common agent utilized for the purpose of deliberate self-poisoning (41.3% for males and 54.9% for females). A majority of the patients took a single agent. Oral route was most commonly used for the purpose of deliberate self-poisoning. (Table 3) The place of incidence most commonly was found to be home. Most patients attempted deliberate self-poisoning during day.

Drug abuse is more common in males as compared to females i.e. 17.0% and 2.7% of male and female populations respectively. ($p<0.05$) Psychiatric illness was more common in men (27.7%) attempting suicide compared to the (7.6%) women ($p<0.05$), (Table 4).

Discussion

Deliberate self-poisoning is voluntary self-ingestion of a substance in excess of any prescribed or generally recognized therapeutic dose irrespective of the apparent purpose of the act[6]. In the recent years a large number of patients have been admitted to medical wards with the act of deliberate self-poisoning. Some have the intention of taking their lives while most have other motives for their actions[7]. Modes and trends in self-poisoning change over times and differ between regions[8] and also according to age and gender[9]. These trend, reflect differences in etiology, risk, nature of suicidal behavior and its prevention and treatment[10]. Younger population has the highest rate of suicidal behavior globally. Suicide is responsible for 6% of all deaths in young people[11]. Younger adults are also more likely to repeat non-fatal self-harm[12] as also shown in our study. All cases of attempted suicide used oral route and the majority ingested either benzodiazepines or organophosphate insecticide[13]. In our study oral route was common and organophosphorus compounds were used. Increased occupational instability has been proposed as one factor behind the recent increase in young male suicides. Social factors especially linked to changes in gender roles, seem the most likely explanation.

In our study as reported in some other studies more males attempted the suicide as compared to females (61.5% versus 38.5) reflecting the international trend of younger men resorting to deliberate self-harm. A study in Lahore also shows that 55% were male and 45% were females who presented in emergency after suicidal attempts[14]. According to a study done in emergency department in a hospital of Lahore, majority of patients were young (62%) and preponderance was of females (60%) and more in married females. Lower social class was predominant (60%)[15]. There has also been a change in family structure in recent years. Nuclear family structures are commoner. In urban setups majority of suicide attempters have been found to belong to nuclear families.

In females, there is an appeal function of deliberate self harm, whereby deliberate self harm is used to communicate distress or to modify the behavior and reactions of other people, seems more common. In males, deliberate self-harm is more often associated with greater suicidal intent. Psychosocial interventions following self-harm might further reduce the rate of subsequent suicide[16].

There is a fairly strong association between unemployment rates and suicide, but the nature of this association is complex. Unemployment may drive up the suicide risk through factors such as poverty, social deprivation, domestic difficulties, and hopelessness. Furthermore, persons with psychiatric disorders are at higher risk of suicide and are also more likely to be unemployed[17].

Psychological distress, experiences of different types of violence should be considered as risk factors for deliberate self-harm in young people[18].

In a psychological autopsy of 100 consecutive suicides in a rural population in India, 37% had a

DSM-III-R psychiatric diagnosis (Diagnostic and Statistical Manual - III - Revised); alcohol dependence (16%) and adjustment disorders (15%) were the commonest diagnoses, and schizophrenia, major depressive episode, and dysthymia constituted a smaller proportion (2% each)[19].

In another study conducted in South India revealed that the population which performs deliberate self-harm has similar characteristics to the one who complete suicide, with a majority belonging to middle aged, unemployed, married males and housewives from rural background. Thus both these population have overlapping socioeconomic characters[20].

Family disputes, interpersonal conflicts with opposite sex, marital problems, chronic illness, unemployment, financial difficulties have been found to be common precipitating factors in various studies. In some other studies legal, social and economic discrimination, low socioeconomic status, chronic poor physical health and being married are common risk factors for Deliberate Self-Harm (DSH).

It is difficult to estimate incidence in general population. But usually females attempt Deliberate Self-Poisoning (DSP) more frequently than males. Younger age group most frequently attempt suicide. Among females married females form the largest group, followed by single females, then single males and lastly married males. Number of divorced and widowed individuals in both groups is negligible. Another study in Karachi showed 57% females and 43% males. A similar study in Lahore showed majority of young married females belonging to lower socioeconomic class. The occupation survey showed that 24.9% were laborers while 17.9% were in service.

Organophosphate poisoning was the most common toxic substance employed. Most patients poisoned themselves at home and the poison was taken orally in 95.5% of the cases. Medications are also very commonly used. Majority of these poisons are less toxic but deaths do occur with Barbiturates and Benzodiazepines. These drugs are commonly used because of their free availability. As Deliberate Self-Poisoning (DSP) is mostly not premeditated any substance that is perceived as being toxic is used for the purpose of attempting suicide. Deliberate Self-Harm (DSH) involves acts such as self-cutting and self-poisoning, carried out deliberately with or without intention of committing suicide[21].

Identifying variables that indicate a greater risk of suicide in relation to gender is an important task. Most of the male subjects who attempted Deliberate Self-Poisoning (DSP) in our study were unmarried. Conversely the proportion of married women committing suicide was significant indicating a subservient role in the family system. Most of the marriages in our society are arranged and with many nuclear families living together without adequate privacy and a lot of social interference; the Deliberate Self-Poisoning (DSP) indicates the need for attention or the cry of help of many of these female subjects. Having a young child explains the protective effect of marriage in women while in men marriage exerts a protective influence against suicide. Strong family ties and commitment plays an important role in prevention of suicide. In the western hemisphere in both genders marriage exerts a protective role against Deliberate Self-Harm (DSH). This is not so in our country where married females were in larger numbers as compared to unmarried females in developed countries.

Educational level had an effect on frequency of Deliberate Self-Poisoning (DSP) in our study as 42% of one subjects were illiterate while 31% had primary education. This negative effect of limited schooling in the young people related to the incidence of suicide has been attributed to their lower socioeconomic class or undiagnosed, untreated or under-treated psychiatric illness in European studies. Few predisposing factors have been studied in Pakistan. In Pakistani society social and economic discrimination predisposes to psychological distress and subsequent suicidal behavior.

We suggest that all studies focusing on poisoning and toxicology must employ suggestions

and terminologies recommended by International Programme on Chemical Safety (IPCS) INTOX Programme. This programme is a global endeavor to promote chemical safety through the establishment and strengthening of poisons centres. The Programme's objectives are achieved through international collaboration of specialists from over 75 countries. These specialists work in poisons centres, clinical treatment units and analytical toxicology laboratories, hence, contributing to the programme in a number of ways[22].

Collecting data pertaining to deliberate self-poisoning will help to determine interventions and development of policies at public health level. Education about the dangers of drug overdose and discussions of common emotional problems might be provided for teenagers and medical personnel. Programs should also focus on patients who have self-harmed to help them cope more appropriately with their distress. Alterations of socioeconomic conditions are also very pertinent in reducing the frequency of Deliberate Self-Harm (DSH) in Pakistan.

Conclusion

This study highlights differences in self-harming behavior in males and females. Young male unmarried adults belonging to low socioeconomic group are more likely to attempt Deliberate Self-Poisoning (DSP). Psychiatric illness and history of drug abuse also predisposes a person to attempt suicide. The incidence of deliberate self-poisoning can be reduced by developing a comprehensive policy aimed at this population.

Conflict of interest

The author has no conflict of interest and no funding/grant from any organization.

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