Demographic Risk Factors of Suicide in Savojbolagh City of Tehran Province: 2007-2009

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ABSTRACT Suicide is an important public health difficulty and the third leading cause of death among young population. This study examines some of the demographic risk factors of suicidal behaviors in Savojbolagh city. In a retrospective, descriptive, and cross-sectional study, suicidal behaviors from March 2007 to March 2009 in Savojbolagh city were investigated. A unified questionnaire was designed in mental health research centre for data gathering. A total of 892 suicidal behavior reports were collected from the health facilities. Suicide attempts were more frequent in females, young people, the married, high school graduates, and housewives. The most common motive for suicide attempt was interpersonal quarrels and secondly, economical problems. Completed (fatal) suicide was higher in males, older people, and unemployed subjects. Demographic risk factors in any region or country are dependent upon the local factors such as socioeconomic status and cultural beliefs which need to be considered in suicide prevention planning.

INTRODUCTION

Suicide is a social and mental health disorder which is considered as a serious public health problem. According to WHO, suicide is the third leading cause of death among people aged 15-44 years old (Grzywa et al. 2010). This problem has gained a special attention in the first and second levels of health care system (Bursztein Lipsicas et al. 2011). More than 20 to 50 million suicide attempts are reported annually of which one million of them is completed suicide, that is, suicides ending with death, more than the annual mortality rate due to war and homicide together (Kessler et al. 2005). In 2001 the total number of suicide deaths was higher than war deaths, that is, 500,000 and 23,000 respectively (World Health Organization 2010). Worldwide, it was estimated to represent 1.8 percentage of the total global burden of diseases in 1998, and in the countries with market and former socialist economies it is supposed to reach 2.4% by 2020 (World Health Organization 2010).

In Iran, statistics show a number of 5.7 and 3.1 suicides per 100,000 people in men and women in 2001, respectively (Moradi and Khademi 2002). National study of burden of diseases in 2004 revealed that the Disability Adjusted Life Years (DALY) for suicide and self-harm behaviors were 206.2 per 100,000 population. This study also showed that suicide and deliberated self-harm had the 6th rank in both genders from the total accidental etiologies of DALY (Naghavi et al. 2007).

Age is an important factor which can influence suicide rate in general population. In previous studies the suicide rate was more common in adolescents and elderly people. The 2007 Youth Risk Behavior Surveillance has demonstrated that 6.9% of high school students had attempted suicide in the year prior to the survey (Eaton et al. 2008). In 2004, the incidence of suicide in those aged 65 years old and older was 14.3 for every 100,000 people, compared to the national average of 10.9 suicides for every 100,000 people (The National Institute of Mental Health 2009).

Socio-economic class, occupation, marital status, and also educational level are the other important variables. Recently unemployment rate has increased in many countries and this had consequences in enhancing social vulnerability especially among youths facing suicide (Stenager and Qin 2008; Al Ansari and Ali 2009; Janet Kuramoto et al. 2013). Poverty and low income, with concomitantly fewer options and opportu-

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nities, correlate with suicide (Zarghami and Khalilian 2002; Agerbo et al. 2006). Studies confirmed by clinical experiments, have shown that many of the people who attempt suicide suffer from lack of abilities in problem solving specially in interpersonal relationships (Zarghami and Khalilian 2002; Nordentoft 2007). Many studies have also demonstrated that educational level has a reverse correlation with suicide attempt. In fact, less education is associated with higher risk of suicide attempt (Zarghami and Khalilian 2002; World Health Organization 2003; Lee et al. 2009; Thomyangkoon et al. 2005). There are many studies about the effect of marital status on suicidal behaviors. It seems that unmarried men and divorced or widowed women are at the highest risk (18). This seems to increasing in single males at older ages (Sanchez 2007; Stenager and Qin 2008; Denney et al. 2009).

Objective

In the current study the data from the suicide registration system in Savojbolagh city were used to describe some of the characteristics of cases for completed (fatal) suicide and attempted (non-fatal) suicide and their motives in years 2007-2009. Knowledge of these characteristics is needed for designing better targeted suicide prevention interventions.

MATERIAL AND METHODS

This was a retrospective, descriptive, and cross-sectional study of suicidal behaviors from March 2007 to March 2009 in Savojbolagh city in Tehran province. This study was designed in the mental health research centre, Iran University of Medical Sciences, and based on the data from the Primary Health Care (PHC) system.

The basic unit of Iran health system in rural areas is the health house. At least one male and one female multipurpose health worker, work in each health house. In urban areas, the counterpart of health house is health post which is covered by volunteers. The next level of care is the urban or rural health centre. The health centres are staffed by general practitioners, disease control technicians, family control technicians, and nurses. At the central level of city, district health centre typically serve the whole population of the catchment area. In addition, in urban areas

particularly bigger cities, the PHC is supported through hospitals (outpatient and inpatient services) which serve patients who are referred by them.

Data was collected from 46 health houses, 18 rural and urban health centres, and 2 general hospitals in Savojbolagh city by the questionnaire which had been designed in the mental health research centre. This questionnaire gathered some demographic variables for planning suicide prevention interventions plus other variables such as sex, age, marital status, education, occupation, motive, and outcome which were selected from the previous similar studies (Rodríguez Pulido et al. 2006; Kanchan and Menezes 2008; Kanchan et al. 2009; Hosseini et al. 2010; Watzka 2012; Lari et al. 2007).

All patients who were hospitalized for suicide were interviewed by a technician or nurse practitioner in the health house, health centre or hospital staff room during the hospitalization period. If a patient was unable to communicate or died during the hospitalization, the personal history and relevant information in the questionnaire were obtained from his/her relatives or family such as spouse, parents, brother/sister or a friend who knew the subject well-enough.

In order to run the project, a disease control technician from each health centre and a nurse from each general hospital were selected to participate in the training workshop. They were trained in case of the objectives, procedure, and questionnaire of the study. Also, in rural areas disease control technician was responsible to train health workers of its catchment area. Disease control technicians and nurses had direct contact with the mental health research centre during the research period to resolve their problems.

In rural areas data was collected from the most peripheral health unit or health house, to the more central unit or health centre. But in urban areas data was collected from the health centres. At district health centre there was a mental health expert who had enough experiences in health system and data gathering. He had been trained for the project and did the primary organization of the data. Finally, data was sent to the Mental Health Research Centre for further analysis. The main outcome of the study was self-reported by the patients during their stay in healthcare centre.

Statistical Analysis

Data was analyzed in the software package for social sciences (SPSS) version 16. Descriptive indices were calculated and reported. P values lower than 0.05 were considered significant.

RESULTS

A total of 892 reported suicide events, from 46 health houses, 18 rural and urban health centres, and 2 general hospitals were chosen for this study. Totally, 570 (63.9%) were female (p<0.001), 725(82.1%) were under 30 years old, and 65 (7.4%) were more than 40 years old (Table 1). The subjects were between ages 10 to 88 years old and the mean age was 24.83 years old.

Table 1: Socio-demographic characteristics and outcome of suicidal cases

Characteristics	All cases n = 893(%)	Attempted (non-fatal) n =877(%)	Completed (fatal) n = 15(%)
Gender (892)			
Female	570 (63.9)	567 (99.5)	3 (0.5)
Male	322 (36.1)	310 (96.3)	12 (3.7)
Age (Years) (832)			
≤ 20	349 (39.5)	344 (98.6)	5 (1.4)
21 – 30	376 (42.6)	371 (98.7)	5 (1.3)
31 – 40	93 (10.5)	92 (98.9)	1 (1.1)
≥ 41	65 (7.4)	61 (93.8)	4 (6.2)
Marital Status (891)			
Single	408 (45.8)	402 (98.5)	6 (1.5)
Married	480 (53.9)	471 (98.1)	9 (1.9)
Divorced	3 (0.3)	3 (100.0)	0 (0.0)
Educational Level (832)			
Illiterate	32 (3.8)	32 (100.0)	0 (0.0)
Primary school	76 (9.1)	74 (97.4)	2 (2.6)
Secondary school	228 (27.4)	225 (98.7)	3 (1.3)
High school	467 (56.1)	460 (98.7)	6 (1.3)
University	30 (3.6)	28 (93.3)	2 (6.7)
Occupational State (590)			
Unemployed	96 (16.3)	90 (93.7)	6 (6.3)
Employed	96 (16.3)	91 (94.8)	5 (5.2)
Student	110 (18.6)	107 (97.3)	3 (2.7)
Housewife	281 (47.7)	280 (99.6)	1 (0.4)
Soldier	5 (0.8)	5 (100.0)	0 (0.0)
Retired	2 (0.3)	2 (100.0)	0 (0.0)

Table 1 demonstrates that suicide attempt in married subjects in comparison to single subjects was higher (53.9% and 45.8%, respectively). Among different educational levels, suicide attempt was higher in high school graduated subjects (56.1%). On the other hand, the lowest observed rate was in graduate educational levels (3.6%). Analysis of suicide data based on occupational status revealed higher frequency in housewives (47.7%) and students (18.6), respectively. The total fatality rate in the study was 1.7%. It was more prominent in men (3.7%), the married (1.9%), older than 40 years old (6.2%), advanced educational level (6.7%), and the unemployed (6.3%).

Analysis of motives demonstrated that the most common cause of suicide in all of the studied subjects had been interpersonal quarrels and secondly, economical problems. Interpersonal problems were more prominent among women (p<0.001). Suicide attempt motivated by mental disorders was enhanced by increase in age. On the basis of marital status it seemed that economic difficulty was a more potent motivation for suicide amongst singles. Motives regarding educational level revealed that interpersonal conflict in the illiterate subjects are more significant than the other groups (Table 2).

Table 2: Principal motives for suicide attempt

Variable (n)	Inter-personal conflict n (%)	Mental disorder n (%)	Economic difficulty n (%)	Other (Addiction, Divorce, Soldier) n (%)
Gender (863)				
Female	356 (64.5)	37 (6.7)	155 (28.1)	4 (0.7)
Male	165 (53.1)	29 (9.3)	108 (34.7)	9 (2.9)
Age (Years) (858)				
≤ 20	200 (58.7)	23 (6.7)	114 (33.4)	4 (1.2)
21 – 30	225 (61.3)	26 (7.1)	109 (29.9)	6 (1.7)
31 – 40	55 (62.1)	8 (8.7)	23 (25.9)	3 (3.3)
≥ 41	35 (56.5)	10 (16.1)	17 (27.4)	0 (0.0)
Marital Status (662)				
Single	224 (56.9)	26 (6.6)	138 (35.0)	6 (1.5)
Married	294 (63.2)	39 (8.4)	125 (26.9)	7 (1.5)
Divorced	2 (66.7)	1 (33.3)	0 (0.0)	0 (0.0)
Educational Level (804)				
Illiterate	23 (71.9)	2 (6.2)	7 (21.9)	0 (0.0)
Primary school	43 (58.9)	8 (11.0)	20 (27.4)	2 (2.7)
Secondary school	123 (55.4)	18 (8.1)	72 (32.4)	9 (4.1)
High school	282 (62.7)	32 (7.1)	133 (29.6)	2 (0.6)
University	18 (64.3)	2 (7.1)	8 (28.6)	0 (0.0)

DISCUSSION

In this study, suicide attempt was more prevalent in females, young people, and housewives, while the frequency of completed suicide was higher in males, older people, and the unemployed. Literature on suicide indicates that men are more likely to achieve a completed (fatal)

suicide than women, whereas women are more prone to make suicidal attempts (Moradi and Khademi 2002; Zarghami and Khalilian 2002). These results are similar to the reported cases in Bahrain, in which young females are at high risk for suicide attempt and low risk for completed suicide (Al Ansari and Ali 2009; Hosseini et al. 2010; Watzka 2012) and consistent with the typical suicide completer in developed countries who is an elderly male.

Age-specific analysis of data showed that suicide attempt was more frequent among the younger ages (≤ 30 years). This age distribution was somewhat similar to some reports from other developing countries which exhibited increasing involvement of younger people (Eaton et al. 2008; Al Ansari and Ali 2009). Several studies have demonstrated that the mean age of suicide attempt in Iran is from 10 to 30 years old (Yasamy et al. 2002; Zarghami and Khalilian 2002; Zohor and Aflatonian 2002; Kaldi and Geravnd 2003; Betz et al. 2011; Saberi Zafaghandi et al. 2012). These studies disclose that adolescents and young adults are prone to suicide attempt, probably suffering from stressful events which they cannot manage. Stressful events usually play as both precipitating and predisposing factors in suicide attempt; chronocity of stressful events is a predisposing factor and its severity along with other stressors act as a precipitating factor (Brent et al. 1991). Here it should be mentioned that more than 76% of total population in Savojbolagh is between 10 to 30 years old which might explain the higher frequency of suicide attempts in this age group in this city.

Marriage might have a protective effect against suicide (Cutright et al. 2007), but some study illustrate the fact that those people who may be prone to suicide are more likely to be single or to have been divorced or widowed (Hosseini et al. 2010). While, some studies have confirmed the researchers' findings, still they reported that marriage might not be protective in all cultures, especially for young women (Al Ansari and Ali 2009; Watzka 2012). Indeed, in many studies suicide attempt was more prominent among married subjects. For instance, a study in USA has shown the protective impact of marriage is higher for suicide than for natural causes of death and their findings support the notion that marital status may dramatically influence the risk of suicide (Denney et al. 2009).

Recently, several studies have been published which explain suicidal behavior is a more common phenomenon in housewives and students (Heydari 1997; Yasamy et al. 2002; Kaldi and Geravnd 2003) same as our results. On the other hand, some studies such as one done in New Zealand from 2001 to 2005 have demonstrated that housewives and people with office jobs had the lowest suicidal rates (Gallagher et al. 2008). Also in this suicide list, students had the second rank, and there were no differences between employed and unemployed subjects.

In Iran, educational level has shown to be less effective than the other factors in suicide related studies. Our findings demonstrated that suicide rate was more popular among high school graduate subjects. A study in Kouhdasht city demonstrated that illiteracy is a risk factor of suicide in both genders (Kaldi and Geravnd 2003). Another study in Karaj city revealed the higher suicide risk in high school students (Nojomi et al. 2008). In Mazandaran province most of the suicide attempts happened in housewives, married, and high school graduate females (Zarghami and Khalilian 2002).

Suicide motive is an interesting and challenging entity in suicidal behaviour studies. In our study, interpersonal conflict was the most frequent motive in genders, all age groups, and educational levels. A study reported severe interpersonal conflicts in two days before death as a significant predictor of Chinese suicide (Zhang et al. 2004). Interpersonal problems might be due to lack of problem solving skill. Fighting with the spouse or other family members, particularly of the rural females, is also another major event prior to many cases of Chinese suicides (Zhang et al. 2004). In this study economic problems is another main motive for suicidal behaviour. This was more prevalent in single males who were under 20 years old and with high school educational level. In Denmark, the investigation of suicidal behaviours showed that economic stressors such as unemployment and low income increase suicide risk in males more than female subjects (Stenager and Qin 2008), and this supports the hypothesis that men respond more strongly to poor economic conditions than women (Dome et al. 2013). Low educational status could be associated with low economic status. But in our subjects, illiterate people reported lesser economic difficulty. This finding is not similar to previous studies (Read 2011; Janet Kuramoto et al. 2013). This may be due to more opportunities to work for these subjects in the study field.

In this study mental disorders were the third motive of suicide. It was not a prominent risk factor in comparison to previous researches. There are several studies which have reported mental illnesses, in particular depression, as the foremost predicting factor of suicidal behaviours ((Scocco et al. 2008; Schenner et al. 2011; Windfuhr 2011; Kyaga et al. 2013). In Denmark, the most prominent risk factor for suicide was psychiatric disorder leading to hospitalization (Stenager and Qin 2008). In China, suicide research showed that 76% of the attempters have been diagnosed with at least one axis I disorder (Zhang et al. 2004). In this sense, our results were contrary to Western studies and almost similar to Mumbai study. This latter study explained that social and situational factors appear to play a relatively greater role than psychiatric illness in self-harm and suicide in Asia compared to Europe and North America (Parkar et al. 2008).

CONCLUSION

The effectiveness of each demographic risk factor for suicide such as gender, age, marital status, occupational status, and educational level are probably based on the socio-economic status and some of the cultural and religious beliefs. Hence, health systems need to define the most important risk factors before any intervention.

RECOMMENDATIONS

Based on our findings it is recommended that suicide risk factors be taken into account in strategic planning of suicide prevention.

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