



Preliminary communication

Gender differences in completed suicides in Istanbul, Turkey

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ABSTRACT

Background: Psychological autopsy studies have been widely used to identify the cause of suicide. However, gender is one of the most frequently replicated predictors for suicide. To identify further the significant risk factors for suicide among males and females separately.

Method: Data were obtained from The Turkish-Istanbul Forensic Medicine Institute Morgue Department for all suicides deaths from April to August 2002 in Istanbul. 124 completed suicides were included in the study.

Results: This study findings suggest that unemployed, not married or in a de facto relationship, previous suicide attempt, and alcohol or substance abuse were common amongst those who died by suicide. Most of the victims were male; the most frequent suicide methods were hanging and jumping down a high building followed by firearms. Both males and females were most frequently affected by psychiatric disorders. It was found that 108 cases that did not receive psychiatric care attempted suicide for the first time and committed suicide.

Conclusion: This finding suggests that suicides should be investigated by an expert team and not by the police and victims' relatives only to determine whether they are really suicides or not.

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1. Introduction

Suicides may have a wide variety of dimensions including biological, psychological, sociological, epidemiological, historical, philosophical and cultural factors and it is difficult to solve suicidal cases. It is also difficult to decide whether they are really suicides or not. Psychological autopsy studies have been widely used to identify the cause of a suicide (Judd et al., 2012). To our knowledge, there have been few studies on completed suicides in Turkey. Therefore, psychological autopsy should be performed to differentiate cases suspected of suicides based on death examinations from deaths due to accidents or so-called accidents and from natural deaths.

Whilst suicide rates vary between countries, two important consistencies have been noted; there is a higher rate of suicide among men than women, and the global rate of suicide increased between 1950 and 2004, especially among men (Qin et al., 2000; Hawton, 2000; Bertolote and Fleischmann, 2002). The male:female ratios of suicide vary between countries. While this ratio is typically 3–4 to 1 in English-speaking and European countries, in some Asian countries it is often less than 2–1 (Yip et al., 2000). China is the only country that reportedly has a higher suicide rate

among women than men (Bridges and Kunselman, 2003). Several explanations have been put forward to account for this difference between the East and West (Ka et al., 2009).

The purpose of this study is to identify further the significant risk factors for suicide among males and females separately.

2. Methods

A hundred and thirty deaths from Istanbul and surrounding towns suspected of suicide based on post-mortem examinations performed by a public prosecutor and a doctor on the day or the following day when suicides occurred and consecutively referred to Istanbul Forensic Medicine Institute between April and August in 2002 were exposed to psychological autopsy, systematic toxicological analyses of blood, urine and internal organ specimens collected with the Standard technique and biological and histopathological examinations, crime scene investigation reports including a sketch of the crime scene, eye witness testimonials and information about identities of suicide victims and information derived from court documents and interviews with suicide victims' relatives. Based on the psychological autopsies, 124 deaths considered as suicides were included in the study and 6 deaths were excluded since there was not sufficient evidence to confirm them as suicides.

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At least one first or second degree relative of each suicide victim was interviewed face to face. Of all interviews, 90% were conducted on days when suicides occurred and 10% within one week of suicides. Informed consent was obtained from all interviewees. A semi-structured questionnaire was developed with the help of a psychiatrist and a forensic medicine specialist. The questionnaire was composed of questions about socio-demographic characteristics, gender, age, marital status, education level, economic status, occupation, health insurance, physical illnesses/disability, personality traits, relationship with family and friends, psychiatric disorders, psychiatric disorders of family history, psychoactive substance abuse, narcotics/sedatives in blood/urine, legal problems. There were also questions whether they attempted suicide before and if they, did how many suicide attempts they had, whether they left an oral or written message, whether they had suicidal thoughts and when at the time of suicide. The mental state section consisted of questions about symptoms required to make a

diagnosis according to the Diagnosis and Statistical Manual of Mental Disorder (DSM-IV; American Psychiatric Association, 1994). All diagnoses were discussed and agreed by the interviewer and a psychiatrist other than the one who performed interviews. The answers to the question what s/he was like were categorised into five parts: (a) quiet, calm and cooperative, (b) nervous and uncooperative, (c) have psychiatric problems, (d) humorous, energetic and enthusiastic and (e) miscellaneous ($n=3$, 2.4%). Data were analysed with SPSS 11.5, and χ^2 and t -test. $p < 0.05$ was considered significant.

3. Results

There was a significantly higher rate of females who committed suicide at young ages ($p < 0.01$). This study found that unmarried (single, widowed, divorce) victims committed

Table 1
Socio-demographic characteristics of the female and male.

	Male (n=83) (%)	Female (n=41) (%)	Total sample (n=124) (%)	P, t or χ^2 test
Age (mean ± sd)	38.5 ± 17.0	29.0 ± 13.8	35.4 ± 16.5	.002
Marital status				
Married	41 (69.5)	18 (30.5)	59 (47.6)	NS
Unmarried (single, widowed, divorce)	42 (64.6)	23 (35.4)	65 (52.4)	
Education level				
Literate/primary school	36 (61.0)	23 (39.0)	59 (47.6)	NS
Secondary school	23 (69.7)	10 (30.3)	33 (26.6)	
High school/university	24 (75.0)	8 (25.0)	32 (25.8)	
Economic status				
Income > expenditure	40 (81.6)	9 (18.4)	49 (39.5)	.009
Income = expenditure	30 (62.5)	18 (37.5)	48 (38.7)	
Income < expenditure	13 (48.1)	14 (51.9)	27 (21.8)	
Occupation				
Employed	57 (83.8)	11 (16.2)	68 (54.8)	.001
Unemployed	26 (46.4)	30 (53.6)	56 (45.2)	
Health insurance				
Yes	30 (56.6)	23 (43.4)	53 (42.7)	.035
No	53 (74.6)	18 (25.4)	71 (57.3)	
Physical illnesses/disability				
Yes	16 (72.7)	6 (27.3)	22 (17.7)	NS
No	67 (65.7)	35 (34.3)	102 (82.3)	
Personality traits				
Quiet, calm and cooperative	37 (62.7)	22 (37.3)	59 (47.6)	NS
Have psychiatric problems	15 (57.7)	11 (42.3)	26 (21.0)	
Joyful, energetic, enthusiastic	16 (84.2)	3 (15.8)	19 (15.3)	
Uncooperative, nervous	14 (82.4)	3 (17.6)	17 (13.7)	
Other	1 (33.3)	2 (66.7)	17 (13.7)	
Psychiatric disorders				
Yes	51 (67.1)	25 (32.8)	76 (61.3)	NS
No	32 (66.7)	16 (33.3)	48 (38.7)	
Psychiatric treatment				
Yes	10 (50.0)	10 (50.0)	20 (16.1)	NS
No	54 (51.9)	16 (48.1)	104 (83.9)	
Psychoactive substance abuse				
No/smoking	62 (62.0)	38 (38.0)	100 (80.6)	.029
Alcohol	20 (90.9)	2 (9.1)	22 (17.7)	
Substance	1 (50.0)	1 (50.0)	2 (1.6)	
Narcotics/sedatives in blood/urine				
No	65 (66.3)	33 (33.7)	98 (79.0)	.006
Alcohol	16 (88.9)	2 (11.1)	18 (14.5)	
Substances	2 (25.0)	6 (75.0)	8 (6.5)	
Legal problems				
Yes	8 (100.0)	–	8 (6.5)	.040
No	75 (64.7)	41 (35.3)	116 (93.5)	

NS: Statistically no significant difference between the group of female and the group of male ($P < .05$).
P value, $[\chi^2]$ test (two-sided) between female and male for all variables except mean age (student t test).

suicides more than married victims. Of the total sample 47.6% had at most literature/primary school education. In both gender, victims had low education level. Most of the suicide victims had described their income as “income > expenditure” (39.5%) and “income = expenditure” (38.7%) according to the self-report of their relatives. A statistically significant difference was found between gender and economic status in victims ($p < 0.01$). In this study, 45.2% of the suicide victims did not have a well-paid job. As for the relation between employment and gender, a significantly higher rate of unemployed females and employed males, most of whom had badly-paid jobs, were at high risk of suicides ($p < 0.001$). In this study, 57.3% of the victims did not have a health insurance. A significantly higher rate of females with health insurance and males who did not have health insurance were at high risk of suicides ($p < 0.05$).

Of the total sample 17.7% had a physical illness/disability (males more than females). Based on the interviews with suicide victims' relatives, 47.6% of the victims were quiet, calm and cooperative. As shown in Table 1, 48 suicide victims (38.7%) were not diagnosed with a psychiatric disorder, but 76 suicide victims (61.3%) had signs of psychiatric disorders. Of the total sample 83.9% did not have a psychiatric treatment. In this study, 22 suicide victims took alcohol and 2 suicide victims took substance although the percentages of victims found to take alcohol and substances were 14.5% and 6.5% respectively at autopsy. Since the relatives of suicide victims may not be aware of victims' alcoholism or substance abuse, toxic analyses of blood, urine and internal organs were made. These analyses revealed that 21% of the victims took alcohol and substance including drugs used to commit suicide. Eighty-seven point five per cent of the male suicide victims and 12.5% of the female suicide victims took alcohol or substances with a significant difference ($p < 0.05$). In this study, toxicological analyses revealed that the rate of male suicide victims taking alcohol was higher and that the rate of female suicide victims taking substances was three times higher ($p < 0.01$). In this study, only eight suicide victims had legal problems. All of them were male. A statistically significant difference was found between gender and living situation legal problem of victims ($p < 0.05$) (Table 1).

14 victims (11.3%) had a family history of suicide and only seven victims (5.6%) had committed suicides in near surroundings. In this study, 37.1% of the suicide victims clearly expressed their intentions to commit suicide. In this study, most of the suicide victims were residing in the city centre and towns and the suicide was committed in their flats ($p < 0.001$).

In the present study, 46% of the victims committed suicide between 12.00 a.m. and 08.00 p.m. There were various methods of suicides employed in which 74 hanged themselves, 25 shot themselves with firearms, 13 jumped down a high place, 7 took drugs and 5 used cutting/drilling instruments on themselves.

The leading cause of suicides was psychiatric disorders ($n=35$; 28.2%) followed by unknown factors ($n=28$; 22.6%), familial problems ($n=23$; 18.5%), financial problems and unemployment ($n=17$; 13.7%), love affair problems ($n=13$; 10.5%), organic diseases ($n=7$; 5.6%) and failure at school ($n=1$; 0.8%). As for the relation between gender and suicides, financial problems, organic diseases, love affair problems and psychiatric disorders affected 94.1%, 85.7%, 76.9% and 60% of the males respectively and failure at school affected only one female victim. Out of 108 suicide victims dying in their first suicide attempt (87.1%), 79 were males and 29 were females. Statistically significant difference between gender and number of suicide attempts was found ($p < 0.001$). In the present study, 16.1% of the victims left a written note and 37.1% of the victims left both an oral and written note (Table 2).

4. Discussion

It has been reported that more females attempt suicide, but more males complete suicide (Hawton and Catalan, 1994; Rhyne et al., 1995; Hirvikoski and Jokinen, 2011). Consistent with the literature, this study included 83 males and 41 females. Comparable with the literature (Kaya, 1993; Conwell et al., 1996; Ekici, 1999), 43 cases of suicide victims (34.7%) aged 15–24 years while 65 cases of suicide victims (54.9%) aged 15–34 years. The two studies that have explored the influences of gender on the marital status/suicide relationship have carried out on American samples (Stack et al., 1994; Stack, 1996). It has been emphasised in many studies that singles, people living alone, people who are divorced and people whose spouses died are at a higher risk of suicides and that marriage is protective against suicides (Berber, 1995; Stack, 1998; Judd et al., 2012).

When the literature was examined it was seen that people who had low education level results pointed out high scores for suicide risk in the original studies of Kaya (1993) and Ekici (1999). Several studies have revealed that low socio-economic status is a factor causing suicide (Diekstra, 1989; Kaya, 1993). However, it is debatable whether some people with low socio-economic status commit suicide, while other people with the same status do not. It has been reported in the literature that unemployment is a risk factor in suicides (Roy, 1995; Koskinen et al., 2002). In this study, employed males were at a high risk of suicides. This finding is supported by the studies showing that malea working at environments where interpersonal relationships are complicated are at a high risk of suicides (Koskinen et al., 2002; Judd et al., 2012). Lack of health insurance is a serious risk factor of suicides since it means inability to benefit from treatment facilities and is an indirect indication of low socio-economic status.

Raising awareness of depression and suicidal attitude is important particularly in older males and especially in those with physical illness, along with talking about the appropriate areas of care and ensuring that people assist their ‘at risk’ friends and family members into appropriate care (Judd et al., 2012). Several studies have determined that a variety of psychiatric disorders are related to suicide psychiatric disorders (Sen-Rohling et al., 1998; Yip et al., 2000; Bertolote and Fleischmann, 2002; Judd et al., 2012).

Conner et al. (2011) determined that it is important to include the role of personality traits, medical illness and functional limitations, and medications in suicide. Analysis of the obtained data demonstrates that suicide attempts amongst males can largely be associated with personality variables reflecting negative emotions, while female suicide attempts are primarily associated with variables regarding activity and self-regulation (Rozanoy and Mid'ko, 2011). Men who later completed suicide reported more extrovert behaviour than male survivors (Hirvikoski and Jokinen, 2011).

There have been studies showing alcohol and/or substance abuse increases the risk of suicides and that the rate of completed suicides is high among alcoholics and substance abusers (Kaya, 1993; Conwell et al., 1996; Sen-Rohling et al., 1998; Ekici, 1999). Consistent with the results of this study, many studies have shown that the rate of male suicide victims taking alcohol or substances is three times higher than that of female suicide victims (Moscicki, 1995; Ekici, 1999). In this study, toxicological analyses revealed that the rate of male suicide victims taking alcohol was higher and that the rate of female suicide victims taking substance was three times higher, suggestive of the fact that females prefer to take drugs to commit suicide more. The preceding finding is consistent with the results of the studies showing that chronic alcoholism and drug abuse decrease social and occupational functions and disrupt familial relationships,

Table 2
Suicide characteristics of the female and male.

	Male (n=83) (%)	Female (n=41) (%)	Total sample (n=124) (%)	P, t or χ^2 test
Suicide of family history				
Yes	10 (71.4)	4 (28.6)	14 (11.3)	NS
No	73 (66.4)	37 (33.6)	110 (88.7)	
Suicides among near surroundings				
Yes	7 (100.0)	–	7 (5.6)	NS
No	76 (65.0)	41 (35.0)	117 (94.4)	
Suicidal thoughts				
Yes	27 (58.7)	19 (41.3)	46 (37.1)	NS
No	56 (71.8)	22 (28.2)	78 (62.9)	
Place of suicides				
City centre–towns	70 (64.2)	39 (35.8)	109 (87.9)	NS
Small towns or village	13 (86.7)	2 (13.3)	15 (12.1)	
Suicide scene				
Flat	42 (55.3)	34 (44.7)	76 (61.3)	.001
Public places	16 (94.1)	1 (5.9)	17 (13.7)	
A place far from the flat	14 (93.3)	1 (6.7)	15 (12.1)	
A place inside or outside the building	11 (78.6)	3 (21.4)	14 (11.3)	
Workplace	–	2 (100.0)	2 (1.6)	
Time of suicides				
5–11 a.m.	23 (76.7)	7 (23.3)	30 (24.2)	NS
12 a.m.–8 p.m.	33 (57.9)	24 (42.1)	57 (46.0)	
Later than 8 p.m.	27 (73.0)	10 (27.0)	37 (29.8)	
Methods of suicides				
Hanging	50 (67.6)	24 (32.4)	74 (59.7)	NS
Firearms	21 (84.0)	4 (16.0)	25 (20.2)	
Jumping down a high building	7 (53.8)	6 (46.2)	13 (10.5)	
Drugs	2 (28.6)	5 (71.4)	7 (5.6)	
Cutting/drilling instruments	3 (60.0)	2 (40.0)	5 (4.0)	
Firearms				
Yes	20 (80.0)	5 (20.0)	25 (20.2)	NS
No	63 (63.6)	36 (36.4)	99 (79.8)	
Causes of suicides				
Psychiatric diseases	21 (60.0)	14 (40.0)	35 (28.2)	NS
Unknown	17 (60.7)	11 (39.3)	28 (22.6)	
Family problems	13 (56.5)	10 (43.5)	23 (18.5)	
Financial problems	16 (94.1)	1 (5.9)	17 (13.7)	
Love affair problems	10 (76.9)	3 (23.1)	13 (10.5)	
Organic diseases	6 (85.7)	1 (14.3)	7 (5.6)	
Failure at school	–	1 (100.0)	1 (0.8)	
Number of suicide attempts				
One	79 (73.1)	29 (26.9)	108 (87.1)	.001
Two	3 (30.0)	7 (70.0)	10 (8.1)	
Three and upon	1 (16.7)	5 (83.3)	6 (4.8)	
An oral or written message				
Yes	29 (63.0)	17 (37.0)	46 (37.1)	NS
No	54 (69.2)	24 (30.8)	78 (62.9)	

NS: Statistically no significant difference between the group of female and the group of male ($P < .05$).
P value, $[\chi^2]$ test (two-sided) between female and male for all variables except mean age (student *t* test).

which increases the tendency to commit suicide (Blumental, 1988; Conwell et al., 1996).

Consistent with the previous findings (Appleby et al., 1999; Mortensen et al., 2000; Cavanagh et al., 2003; Judd et al., 2012) being unemployed, not married or in a de facto relationship, a previous suicide attempt, physical illness, and alcohol or drug abuse were common amongst those who died by suicide.

Only eight suicide victims had legal problems and all of them were males. Women, on the other hand, are liable to psychiatric disorders such as depression, somatization and conversion and consider those illnesses as coping strategies, while men take alcohol or drugs to solve their problems and show aggression to express their anxiety (Rhyne et al., 1995; Moscicki, 1995; Sen-Rohling et al., 1998; Ekici, 1999). Moreover being arrested, in custody and being interrogated or other legal problems are among the factors which increase the risk of suicides (Moscicki, 1995).

It has been reported that suicide victims have a higher rate of relatives who committed suicide and that underlying potential mental disorders might have a genetic origin (Kaya, 1993; Appleby et al., 1999; Hawton, 2000; Ka et al., 2009). Seven cases had relatives who committed suicide, which might have served as role models. It is known that suicide victims either imply or directly express their opinions about committing suicide many times before committing suicide. Therefore, patient's relatives and clinicians should take serious of those self-expressions seriously (Ekici, 1999). Micciolo et al. (1991) reported that the rate of suicides was higher in urban areas than in rural areas. Most of the victims committing suicide in the day time had mood disorders. They might have felt strong enough to perform the last physical action.

The three most frequent ways of suicides were hanging, firearms and jumping down a high building. In Turkey people

have to receive a licence to have firearms and the use of hypnotics and sedatives was restricted in 1986. As a result, the rate of suicides with firearms and drugs decreased. Hanging and jumping down a high place are the two easiest ways of suicide available to everybody. The rate of using firearms, cutting/drilling instruments and burning was high among males and the rate of taking drugs was high among females, which are comparable to the literature (Ekici, 1999). It is known that a considerable percentage of the people committing suicide with high doses of drugs took tricyclic antidepressants and/or sedatives-hypnotics (Hawton and Catalan, 1994). In this study, seven suicide victims took tricyclic antidepressants and/or sedatives-hypnotics. A higher rate of males was affected by love affair and financial problems (contrary to expectations) and a higher rate of females was affected by living alone and family problems.

In this study, most of the victims dying in the first attempt turned out to have psychiatric symptoms. History of suicide attempts is the most important risk factor for suicides among patients with depression (Hawton, 2000). The male suicide victims killed themselves in the first three attempts, but the female victims continued suicide attempts after six failed attempts.

It has been reported that 10–25% of the suicide victims leave a written note (Heim and Lester, 1990; O'Donnell et al., 1993; Ho et al., 1998). In this study, the suicide notes were written to people the victims had problems with and expressed wishes to get those persons punished.

5. Strength and limitation

When it is seen that most of the cases about committing suicides have not been seen by a psychiatrist it is needed to realise such a study. Even the results of this study supports this situation. It is defined that 108 of the 124 cases which are examined in the scope of this study committed suicide for the first time in their lives and 104 of the cases have not received psychiatric care. Moreover, as it is thought that this kind of data can be best obtained in morgue, it is decided that this study be carried out in the morgue via psychologic autopsy examination (physical examination and toxicological analysis) by psychiatrists and medical jurisprudence. Another strength of the study is that the examination occurs just after the realisation of the case.

The limitation of the study is that some families do hesitate giving information because of emotional and/or other special reasons. While the researchers were searching for the origin of the death, they received information from the families/relatives of the cases but it has been handicapped to some extent.

6. Conclusion

Most of the victims were male; the most frequent suicide methods were hanging and jumping down a high building followed by firearms. The male victims preferred methods involving violence such as firearms, cutting/drilling instruments more than the female victims. Both males and females were most frequently affected by psychiatric disorders.

There is a general agreement that it is difficult to solve suicides, a multi-faceted problem which affects people in their most productive years. One more difficulty is to determine whether suicides are really suicides. Therefore, we think that psychological autopsy should be improved. This study revealed that many factors such as psychiatric disorders and psychosocial stressors played a role in suicides. A good team work is required to develop scales to determine causes of suicides.

It should always be kept in mind that suicides can in fact be caused by accidents or murders which seem to be caused by accidents. In other words, a multi-disciplinary expert team should thoroughly investigate suicides to confirm that they are really suicides. Although those teams obtain useful information about suicides, they should be supported by a legal interrogation.

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There is no sponsor for this research.

Conflict of interest

No conflict declared.

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