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A 2-Year Psychological Autopsy Study of Completed Suicides in the Athens Greater Area, Greece

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Objective To study the characteristics of a sample of suicide victims from the Athens Greater Area using the psychological autopsy method for the first time in Greece.

Methods We studied all recorded cases of completed suicide for the 2-year time period November 2007–October 2009 collecting data from the victims' forensic records as well as from the completion of a psychological autopsy questionnaire.

Results 335 persons were recorded as suicide victims. We contacted relatives of 256 victims interviewing those of 248 of them (96.9%). The differences regarding sex, marital and employment status between our sample and the general population were statistically significant ($p<0.001$). The male/female ratio was 3:1. Comparatively more victims were divorced, separated or single and a greater proportion were pensioners or unemployed. 26.0% of the victims had history of prior attempts (64.4% once, 20.3% twice and 15.3% more times). 42.6% were taking psychiatric medication-significantly more women than men according to blood tests; 14.2% had been hospitalized in a psychiatric clinic the year prior to their death. 84.8% have deceased at the place of suicide and 15.2% died in the hospital; 80.3% died indoors and 19.7% outdoors. Men died primarily by hanging or shooting by a firearm while women preferred jumping from height instead ($p<0.001$). As many as 48.8% had expressed their intention to die to their relatives; 26.6% left a suicide note.

Conclusion Our study has shown that the psychological autopsy method is applicable and widely accepted yielding results comparable to the international literature. Specific parameters associated with suicide have been studied for the first time in Greece.

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Key Words Psychological autopsy, Completed suicides, Athens greater area, Greece.

INTRODUCTION

Suicide is a complex phenomenon involving numerous parameters: Socio-demographic, genetic, environmental, medical, and psychiatric.[1-3] Each one of them contributes–to a different extent–in increasing the suicide risk of a particular individual at a given time period. Last but not least, social circumstances and situational factors can play a key role in adding a critical stressor to an already vulnerable individual.[4,5]

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Every year approximately 1,000,000 people die by suicide: It is estimated that by the year 2020 this number will rise to 1,500,000.[6] Greece has one of the lowest suicide rates worldwide according to the latest available data from the WHO (referring to the year 2009): The mean standardized suicide rate in our country was 3.5/100,000: 6/100,000 for men and 1/100,000 for women.[6] Unfortunately, according to national official data, a rise of 16.1% has been already observed in the number of suicides between 2007 and 2009, and all this even before the escalation of the recent severe economic crisis that has afflicted Greece during the last 4 years.[7] In fact, even though official data are not provided for the years 2010 to 2012, unofficially a 40% increase is reported in the number of suicides between 2009 and 2010; consequently, the suicide rate is expected to rise considerably.[8]

A number of previous studies have been focused on the phenomenon of suicide in Greece.[9-13] However, none of them

has used the method of psychological autopsy. The psychological autopsy, developed by Shneidman, is a well-tested method of investigating completed suicides.[14] It joins interviews with relatives of the deceased together with material from the victims' forensic records aiming to create an, as accurate as possible, profile of the victim. It provides extra information to the coroner sometimes facilitating him in defining the cause of death. It is currently considered the most direct method available for studying the relation between particular risk factors and completed suicide.[15,16]

METHODS

For the purpose of our study we developed a psychological autopsy questionnaire based on the most established scientific knowledge about suicide risk factors.[17-19] We included socio-demographic parameters, psychiatric medication intake, and history of previous attempts and of recent -within the previous 12 months- psychiatric hospitalization. We were also focused on the characteristics of the suicidal act itself.

Material for our study was provided by the Athens Department of Forensic Medicine (ADFM), the largest, by far, of its kind in Greece. The ADFM covers the Athens area and its suburbs as well as a number of contiguous counties where approximately 35% of Greece's 10,964,020 population lives.[7] We studied all recorded cases of completed suicides for the 2-year period November 2007−October 2009. All interviews with relatives were conducted by phone usually 2−4 months after the victim's death; this time interval is generally accepted as appropriate in the literature.[20,21]

We have compared the socio-demographic characteristics of our sample with the characteristics of the general population of the Athens Greater Area. The data, provided by the Hellenic Statistics Authority, referred to the last population census prior to the study (2001 census). We compared males and females regarding marital status and types of psychiatric medications found at the blood tests. We performed the same comparison for the suicide methods employed by the two sexes.

Statistical analysis was carried out by the Pearson's χ^2 test for comparison of percentages and the t-test for comparison of means of variables. The level of $p<0.05$ was chosen to indicate statistical significance.

The study was granted approval by the Ethics committee of the "Attikon" General Hospital, and from the head of the ADFM who provided unconditional access to the victims' forensic records.

RESULTS

During the 2-year period of our study 335 individuals were recorded as suicide victims: 250 men (74.7%) and 85 women (25.3%). Mean age of our sample was 53.3 years and standard deviation was 18.3 years. The youngest victim was an 18-year old; the oldest was a 97-year old.

We contacted the relatives of 256 victims (76.4%); for the rest, a phone number was unavailable. We interviewed those of 248 of them (response rate: 96.9%). In 8 cases the relatives were unwilling to cooperate.

The differences regarding sex, marital and employment status between our sample and the general population were statistically significant ($p<0.001$). More men than women died by suicide. Comparatively more of the victims were divorced, separated or single; finally, more were pensioners or unemployed. The socio-demographic characteristics of our sample compared to those of the general population of the Athens Greater Area are shown in Table 1.

The difference regarding the marital status in relation to the victims' sex was statistically significant too ($p<0.001$): A great-

Table 1. Socio-demographic characteristics of the sample and of the general population in the Athens Greater Area (3,837,402 inhabitants)

	Sample (%)	Population (%)	p*
Sex (N=335)			<0.001
Male	74.3	45.7	
Female	25.7	54.3	
Age specific suicide frequencies (N=335, age in years)			<0.001
<18	0	20.7	
18−24	4.8	8.0	
24−34	15.2	17.0	
35−44	17.3	15.1	
45−54	22.7	13.6	
55−64	12.6	10.5	
65−74	10.7	9.5	
>75	16.7	5.6	
Family status (N=248)			<0.001
Single	36.9	31.0	
Married	36.5	57.3	
Divorced-separated	17.7	3.4	
Widowed	9.0	8.3	
Employment status (N=248)			<0.001
Private sector employees	42.9	39.2	
Pensioners	32.3	16.7	
Unemployed†	9.4	4.4	
Civil servants	8.6	11.9	
Students	2.3	8.8	
Housewives	2.3	16.8	
Others	2.3	2.2	

*$p<0.05$, †during−at least−the previous 6 months

er proportion of men were single, divorced or separated while more women were widowed. Women were more frequently under psychiatric medication than men for all kinds of the drugs examined. Finally, there was a different choice of methods among the sexes (p<0.001): More men chose hanging or shooting by a firearm while women preferred jumping from a height. In Table 2 are pictured the abovementioned differences.

As many as 24.0% of suicide completers had attempted suicide in the past: 64.4% once, 20.3% twice, 15.3% more times; 14.2% had been hospitalized in a psychiatric clinic during the year prior to their death. The overwhelming majority (84.8%) of the victims died at the place of suicide and only a minority in the hospital (15.2%). Indoor incidence was four times that of the outdoor incidence (80.3% vs. 19.7%).

Approximately half (48.8%) of the victims had verbally communicated their intention to die to their relatives and 26.6% left suicide notes. Various settlements, such as writing a will or paying-off debts were made by 10.2% of the victims during the weeks or months prior to the suicide.

Employment status, history of prior attempts, psychiatric medication intake, recent psychiatric hospitalization, indoor and outdoor incidence as well as communication of suicide intent were parameters investigated for the first time in a study on suicides in Greece.

Table 2. Family status, psychiatric medication intake and suicide methods according to the victims' sex

	Sample (%)		Total (%)	p*
	Males	Females		
Family status (N=248)				<0.001
Single	39.9	26.9	36.9	
Married	36.7	37.3	36.5	
Divorced-separated	18.6	14.9	17.7	
Widowed	4.8	20.9	9.0	
Medications (N=248)				
Antidepressants	11.3	32.8	16.8	<0.001
Antipsychotics	9.2	24.2	13.0	0.003
Benzodiazepines	6.6	16.7	9.2	0.024
Anticonvulsants	0.5	9.1	2.7	0.001
Suicide methods (N=335)				<0.001
Jumping from a height	23.9	64.3	34.0	
Hanging	38.6	17.9	33.4	
Shooting by a firearm	21.9	1.2	16.7	
Self immolation	2.8	5.9	3.6	
Poisoning by solid or liquid substances	3.2	2.4	3.6	
Cutting	3.2	1.2	2.7	
Run over by train	3.2	1.2	2.7	
Drowning	2.0	2.4	2.1	
Medication overdose	1.2	3.6	1.8	

*p<0.05

DISCUSSION

Most of the findings of our study are supported by the relevant literature as we shall see in detail in the oncoming parts.

Socio-demographic characteristics

The male/female ratio (3:1) of suicide victims is in complete accordance with that of the last extensive study on suicides in Greece conducted by Zacharakis et al.[10] The fact that men die more often by suicide than women is constantly found in the literature at least in Western industrialized nations.[22,23] In comparison to women, men seem to be more reluctant to address themselves to psychiatric services when faced with psychological difficulties, they are less frequently recognized as suffering from depressive disorders by health care professionals and they choose more violent−therefore lethal−suicide methods.[24]

Suicide frequency was very low in the young subjects and very high among the elderly ones. This finding agrees with similar studies confirming an increase of suicide risk with age.[25] Worldwide, suicide risk is low in adolescents and high in the "very old" age group (>75 years).[26] Similar findings have been reported for Greece too.[27]

Relatively more of the victims were divorced or separated in comparison to the general population; less was married. Our results are in concordance with those of similar studies where the protective effect of marriage and the stress of separation has been adequately emphasized.[28-30] Comparatively more men were single, divorced or separated and more women widowed. It could be suggested that the single status increases the suicide risk for men, while marriage seems to have a protective effect for them.[31-34] Furthermore, divorce or separation is apparently an important stress primarily for men while widowhood seems to be a respective stress for women.

More of the victims were pensioners or unemployed in comparison to the general population. It is well known that pensioners are at high risk of suicide for various reasons: Advanced age, retirement, health problems, loss of relatives or friends and loneliness.[35-37] Unemployment could also significantly increase suicide risk: Economic problems, loss of working status, isolation and low self-esteem could exert a pro-suicide influence.[38-40]

History of prior attempts and of psychiatric hospitalization

Approximately one quarter of the victims (24.0%) had history of prior attempt(s); more than half of them once. This

proportion is lower to the one reported by some studies where approximately one third of suicide completers had history of prior attempts.[21,41] However, other researchers report even higher percentages arriving, or surpassing, 40%.[42,43] Our finding also implies that over three quarters of suicide completers had never been attempters in the past. This result stresses the difficulties of the suicide prevention task, given the fact that history of prior attempt(s) represents the single strongest predicting factor for future completed suicide.[44,45]

As many as 14.2% of the suicide victims had been hospitalized in a psychiatric clinic the year prior to their death. It is well-known that history of a recent psychiatric hospitalization is associated with a very high risk of suicide: Former psychiatric inpatients have an estimated 16-fold risk of suicide compared to the risk for patients treated in primary care.[31,46] The risk seems to be particularly high the first 3 months after discharge peaking during the first week.[47,48]

Psychiatric medication intake

Nearly 4 out of 10 victims were taking psychiatric medication (antidepressants, antipsychotics, benzodiazepines or anticonvulsants) at the time of their death. It has been reported that between 33% and 70% of suicide completers are receiving some kind of psychiatric medication when they die.[49,50] The proportion of women taking psychiatric medications was considerably higher that of men in our sample regardless of the drugs investigated; the difference was more pronounced for antidepressants and less so for benzodiazepines. Our findings are confirmed by similar studies.[51,52]

Characteristics of the suicidal act

The most frequent suicide methods were jumping from a height, hanging and self-shooting by a firearm. These methods–all particularly violent–represent an indication of a strong determination to die;[12,53] the last is confirmed by the fact that the vast majority of the victims were found dead at the place of suicide. Both jumping from a height and hanging are easily accessible methods while hanging, in particular, is less likely to be misclassified as accidental or undetermined death.[10] Men chose more violent methods when they decided to die in comparison with women with the exception of self-immolation; finally, firearms were used almost exclusively by men. Our findings are supported by similar studies.[23,53,54]

Approximately one quarter of the victims left suicide notes. Worldwide, the incidence of note leaving varies considerably ranging from 3 to 42%.[55-59] It should be mentioned though that, while the presence of a suicide note is generally considered as an indication of a serious attempt, its absence doesn't necessarily point to a less serious intention.[60]

Nearly half of the victims (48.8%) had expressed their intention to die to their relatives. In this parameter the actual number would most likely be higher given the fact that we interviewed only one relative for every case; suicidal intention could have been communicated to another relative instead. Even though this parameter has not been extensively investigated in a similar way, it has been referred that a considerable part of suicide completers–arriving to 69%–had previously expressed their desire to die to their relatives.[61]

Conclusions

Psychological autopsy was implemented for the first time in our country. We searched an extensive number of parameters. Many of them, such as the victim's employment status, history of prior attempts, psychiatric medication intake prior to the suicidal act, history of hospitalization in a psychiatric clinic the year prior to the death, indoor and outdoor suicide incidence as well as investigation of suicidal communication were studied for the first time in Greece. Most of our findings are in accordance with those of similar studies in the literature.

More than 95% of the relatives contacted agreed to participate in the phone survey; this constitutes a fairly encouraging result. It also provides a motive for additional research valuable for preventive strategy planning much needed given the expected rise in suicides in Greece.

Limitations

Our study presents various limitations. Above all, there is no standardized method of conducting psychological autopsy studies worldwide.[62] Secondly; we weren't able to find the phone number of a relative in approximately 1/4 of the suicide cases. We performed all interviews by phone and with only one relative per case due to financial reasons. This may have caused information loss–and data validity problems–, that direct interviews with more than one relative per case could have prevented. There was also the risk of information bias due to the informants' feelings of guilt or shame and of data loss due to memory decay. Furthermore, we didn't make use of a control group. Finally, our results should not be considered representative of the whole country given the fact that the study covered only the Athens Greater Area.

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