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PATTERNS OF SUICIDE IN CRETAN WOMEN

Abstract: In Greece so far little attention has been given to suicide among women and no systematic analysis has been reported. The goals of the current study were to estimate the proportion of female suicides on the island of Crete, Southern Greece; to describe the victims' sociodemographic profile and suicide-related variables; and to identify potential changes in rates and suicide methods during a predefined time period or between age groups. A retrospective study was undertaken, reviewing all female suicides between 1999 and 2007, and information was extracted into a computerized database. The female suicide incidence in the region was estimated to be 3.2 per 100,000, 1.7 times higher than the corresponding incidence reported for mainland Greece. These women were more likely to be over 55 years of age, to have lived in the western part of the island and to have committed suicide by hanging and self-poisoning. The most interesting finding was that self-immolation accounted for the 4.8% of the female suicide cases in the study area, while there is no mention of suicide by burning in Greece hitherto.

Introduction

Globally, one of the most consistent findings in suicide studies is a phenomenon called the gender paradox of suicidal behaviour [1-3]; women have higher rates of nonfatal suicidal behaviour but lower rates of suicide mortality than men. Nevertheless in several of the world's countries, including Greece, there is an apparent lack of national data on nonfatal suicidal behaviour [3], and furthermore the data on suicidal behaviour available through the WHO database or a number of comprehensive overviews of suicide patterns internationally [4,5] come mostly from industrialized countries.

With respect to Crete, preliminary data on suicidal acts during a 9-year period revealed a surprisingly higher suicide rate compared with the few previous suicide studies in Greece [6-8]; this was possibly a result of the observed differences in social, economic, traditional and life style features between various regions in the country [8,9]. Within this framework, the goals of the current study were to estimate the proportion of female suicides, to describe the victims' sociodemographic profile and suicide-related variables (i.e. seasonal variation and regional differences of suicides), and to identify potential changes in rates and suicide methods during a predefined time period or between age groups.

Materials & Methods

Catchment Area

Crete constitutes the largest island in Greece and one of the 13 administrative regions into which the country is divided. Geographically isolated, the island covers an area of 8,336km², and separates the Aegean from the Libyan Sea, marking the boundary between Europe and Africa. With a population of 601,131 in 2001, as recorded by the National Statistical Service (NSS), Crete is divided into four prefectures –Chania, Rethymno, Heraklion and Lassithi- and represents 5.5% of the total population of Greece. The urban and semi-urban population accounts for the 60% of the total, while the remaining 40% is rural. The 23.4% of the population is employed in the primary sector, the 16.1% in the secondary sector and the 55.6% in the tertiary sector, whilst the corresponding national percentages are 14.4%, 21.7% and 58.6% (2001) and the per capita GDP of the region of Crete represents the 95.9% of the national average [10].

Data Basis

A retrospective study was undertaken, reviewing all female suicides in the region from January 1, 1999 to December 31, 2007. Data on female suicides were collected from the Department of Forensic Sciences of the Faculty of Medicine of the University of Crete and the Department of Justice for the region, and then extracted into a computerized database. In an attempt to eliminate any possible discrepancies [11], the researchers cross-checked their data with official records kept in the police departments and the public prosecutor's files in each prefecture. Suicide deaths were defined by the International Statistical Classification of Diseases (ICD) 9th revision [12], codes E950-E959, and the 10th revision [13], codes X60-X84. Suicide cases were also processed according to the distribution of the prefecture and districts (urban, semi-urban or rural). Urban populations reside in cities and towns with more than 10,000 inhabitants, semi-urban in towns with between 2,000 and 10,000, and rural in villages with fewer than 2,000 inhabitants.

Statistical Analysis

Data are expressed as mean±standard deviation (S.D.) or median (in case of violation of normality) for continuous variables and as percentages for categorical data. Yearly and mean age-specific suicide rates were calculated per 100,000 population, in six-year age groups. The total suicide rates were age-standardized on the Greek population of census year 2001. The Chi-Square goodness-of-fit test compares the observed and expected frequencies in each category of variables to test if all categories contain the same proportion of values. All tests are two-sided, statistical significance was set at $p < 0.05$. All analyses were carried out using the SPSS v16.0 [14].

Results

On the island of Crete from 1999 to 2007, 83 female suicides out of 374 suicide cases were recorded (22.2% of the total). Female suicides had a minimum value of 6 in the year 2001 and a maximum value of 16 in the year 2000; the average over the 9-year period was 9.2. The overall female suicide rate ranged between 4.3 per 100,000 population in 1999 and 2.3 per 100,000 in 2007, with mean incidence of 3.2 (Table 1).

The mean and the range age of the suicide victims were 54.4 ± 20.3 and 17-94, respectively (Table 2). All except seven females were of Greek origin and over half of the suicide cases (55.4%) were non married. The total incidence in the age groups was 1.7 per 100,000 population in 15-24 year-olds, 2.4 in 25-34 year-olds, 4.0 in 35-44 year-olds, 3.5 in 45-54 year-olds, 4.0 in 55-64 year-olds and 6.0 in females ≥ 65 (Table 3).

Table 4 demonstrates the mean annual suicide rate for each method. Hanging ranked first in terms of method preferred (41%), followed by self-poisoning and jumping from high places. Firearms were employed in only two cases of less than 34 years of age. When differences between age groups were analyzed, a significant increase of violent methods (hanging and self-immolation) in women ≥ 65 was observed (Table 5). In parallel, self-poisoning was the most frequent suicide method chosen (60%) in the 35-44 age group.

Table 6 displays the time-related characteristics and seasonal variation of suicide cases, but given the size of our sample no significant relationships emerged; there was no observable trend according to days, months or seasons rather than a random variation of suicide deaths. The correlation between prefecture and district is presented in Table 7 with no significant differences identified ($\chi^2=2.51$, $p=0.474$), with the exception of the prefecture breakdown of suicide cases, where it is striking that there is a higher incidence of female suicides in the western part (4.1 vs 2.5/100,000) of the island. Two thirds of the suicide cases occurred in semi-urban and rural areas.

Discussion

While the current study was a retrospective research and relied on a relatively small sample, so the results may not be generalized to the Greek population, the data reported herein warrant consideration since several key conclusions can be drawn from the data analysis. Female suicide incidence in the Cretan region was estimated to be 3.2 per 100,000 for the period under study (1999-2007), whereas the corresponding incidence for mainland Greece (period 1980-1995) or the region of Epirus (North-West Greece, period 1998-2002) was 1.89 and 1.29 per 100,000 respectively [7,8]. This discrepancy, though, should be interpreted with caution in the light of weighing the factors that may have contributed to the differential geographical impact on female suicide rates.

Regarding the age patterns of female suicides in this report, the ≥ 65 year age group has the highest age-specific rate followed by the 35-44 and 55-64 age groups. Furthermore, no appreciable alterations in the overall rates of female suicides or types of methods being used in the study area were recorded, but there has been an

increase in the use of more violent suicide methods with increasing age. Likely, the most interesting finding is that self-immolation accounts for the 4.8% of the female suicides recorded on the island of Crete, whereas in Greece until today no information is available concerning individuals who committed suicide by burning.

In addition, despite the fact that recent data from several European countries have noted that women are more likely to use drugs in fatal poisoning [5], pesticides were encountered as the most common agents involved in all age groups herein in accordance with findings from rural Latin American and Asian countries [4]. To date, most of the growing body of research into suicide methods has long recognized that the choice of a particular method for suicide depends on the availability, familiarity and accessibility of the mean in a given geographical location which consequently increases the risk of suicide, while cultural and social factors also have a strong influence on the predominant method of committing suicide [1,2,15].

Conclusions

In conclusion, new studies are needed in order to ascertain the underlying factors for the differential geographical impact on female suicide rates, and moreover, further empirical investigation on the particular psychological, social and cultural features that seem to influence the women's suicidal behaviour is considered necessary as a first step toward implementing effective prevention strategies.

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Year	Suicide cases	Female suicides	Percentage of suicide cases per year (%)	Percentage of female suicides per year (%)	Rate per 100,000 population	
					Total	Females
1999	43	12	11.5	14.5	7.6	4.3
2000	61	16	16.3	19.3	10.6	5.7
2001	36	6	9.6	7.2	6.2	2.1
2002	37	8	9.9	9.6	6.2	2.7
2003	42	9	11.2	10.8	7.1	3.1
2004	28	8	7.5	9.6	4.7	2.7
2005	47	8	12.6	9.6	7.8	2.7
2006	43	9	11.5	10.8	7.0	3.1
2007	37	7	9.9	8.4	6.0	2.3
Total	374	83	100	100	–	–
Average	41.6	9.2	11.1	11.1	7.0	3.2

Table 1 – Year-wise distribution of suicide cases and mean annual suicide rate

Variables	N	%
Number of individuals	83	100
Age (years)		
(mean – median – min – max)	(54.4 – 54.0 – 17 – 94)	
15-24	6	7.2
25-34	10	12.0
35-44	15	18.1
45-54	11	13.3
55-64	11	13.3
≥ 65	30	36.1
Nationality		
Greek	76	91.6
Other	7	8.4
Marital Status		
Single	20	24.1
Married	37	44.6
Divorced/Separated	6	7.2
Widowed	20	24.1

Table 2 – Sociodemographic characteristics

	Years	1999	2000	2001	2002	2003	2004	2005	2006	2007	Mean Rate
	Age group										
Females	15-24	0	2.4	0	2.5	0	5.3	5.4	0	0	1.7
	25-34	4.4	4.3	0	2.1	0	4.4	0	2.2	4.5	2.4
	35-44	2.6	12.7	2.5	2.4	4.7	2.3	4.5	2.2	2.2	4.0
	45-54	9.0	5.9	2.9	0	2.9	2.8	2.7	2.7	2.7	3.5
	55-64	0	13.2	0	6.6	3.3	0	3.3	9.6	0	4.0
	≥ 65	11.6	3.8	7.1	5.2	9.2	3.5	4.0	5.0	4.7	6.0

Table 3 – Age-specific suicide rates per 100,000 population

Method	Female suicides
E950 Poisoning by solid or liquid substances	1.1
E951 Poisoning by gases in domestic use	0
E952 Poisoning by other gases and vapours	0
E953 Hanging, strangulation and suffocation	1.3
E954 Submersion (drowning)	0.2
E955 Firearms and explosives	0.1
E956 Cutting and piercing instruments	0
E957 Jumping from high place	0.4
E958 Other means (self-immolation)	0.2

Table 4 – Mean annual suicide rates by different methods

Age group	E950 – E952		E953		E954 – E958	
	N	%	N	%	N	%
15-34	4	25	5	31.3	7	43.8
35-44	9	60	4	26.7	2	13.3
45-64	9	41	8	36.4	5	22.7
≥ 65	5	16.7	17	56.7	8	26.7

Table 5 – Percentage of female suicides per method in terms of age group

Variables	N	%	Significance
Time of death			
6 am – 12 pm	33	39.8	p=0.005
12 pm – 6 pm	19	22.9	
6 pm – 12 am	21	25.3	
12 am – 6 am	10	12.0	
Month of death			
January	5	6.0	p=0.284
February	8	9.6	
March	10	12.0	
April	5	6.0	
May	12	14.5	
June	9	10.8	
July	8	9.6	
August	8	9.6	
September	4	4.8	
October	8	9.6	
November	3	3.6	
December	3	3.6	
Season			
Autumn	15	18.1	p=0.143
Winter	16	19.3	
Spring	27	32.5	
Summer	25	30.1	
Day of death			
Sunday	17	20.5	p=0.203
Monday	4	4.8	
Tuesday	15	18.1	
Wednesday	11	13.3	
Thursday	13	15.7	
Friday	12	14.5	
Saturday	11	13.3	

Table 6 – Time-related characteristics and seasonal variation

		Urban	Semi-urban & Rural	Total	Female population per prefecture	Rate per 100,000 population
Chania	N	9	14	23	73132	3.5
	%	39.1%	60.9%	100%	24.6%	
Rethymno	N	5	13	18	40736	5.0
	%	27.8%	72.2%	100%	13.7%	
Heraklion	N	13	18	31	145167	2.4
	%	41.9%	58.1%	100%	48.9%	
Lassithi	N	2	9	11	37694	3.3
	%	18.2%	81.8%	100%	12.7%	

Table 7. Correlation between Prefecture and District