Suicide in Israel: 1985–1997

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Objective: To examine trends in suicide rates in Israel over a 13-year period. **Method:** All cases of autopsy-confirmed suicide in Israel from 1985 to 1997 were retrospectively reviewed. **Results:** An overall annual increase in suicide rates, with rates in men 3 times higher than those in women, was observed. Suicide rates were highest in the second and third decades of life. Unlike Western countries where gunshot wounds are the most common method of suicide for men and poisoning is most common for women, asphyxiation by hanging was the most common method used by men in Israel, followed by firearm wounds and jumping from heights. In women, however, jumping from heights was the most common method, followed by hanging and poisoning. **Conclusion:** Increasing rates of suicide may be associated with waves of immigration to Israel, increased substance abuse and depression and the political and social climate. Further study to examine the precipitating factors is warranted.

Objectif : Analyser les tendances des taux de suicide en Israël sur 13 ans. **Méthode** : Étude rétrospective de tous les cas de suicide confirmés par une autopsie survenus en Israël de 1985 à 1997. **Résultats** : On a constaté une augmentation annuelle globale des taux de suicide; les taux étaient trois fois plus élevés chez les hommes que chez les femmes. Les taux de suicide étaient les plus élevés au cours de la deuxième et de la troisième décennie de la vie. Contrairement à ce qui se passe dans les pays occidentaux où l'arme à feu constitue le moyen de suicide le plus répandu chez les hommes et le poison est le plus courant chez les femmes, l'asphyxiation par pendaison était le moyen le plus fréquemment utilisé par les hommes en Israël, suivi de l'arme à feu et du saut dans le vide. Chez les femmes, toutefois, le saut dans le vide constituait le moyen le plus répandu, suivi de la pendaison et de l'empoisonnement. **Conclusion** : On peut établir un lien entre l'augmentation des taux de suicide et les vagues d'immigration en Israël, l'augmentation de la toxicomanie et de la dépression, ainsi que le climat politique et social. Une étude plus poussée sur les facteurs de cause à effet est justifiée.

Introduction

"Manner of death" is a medicolegal term that refers to an opinion based on the known facts concerning the circumstances leading to and surrounding a death as well as autopsy and laboratory findings.[1] Establishing the manner of death (i.e., natural, homicide, suicide, accidental or undetermined) is one of the most important

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endeavours in forensic pathology. However, the distinction between the various manners of death is not always clear. There are many cases where a homicide is disguised as suicide or as accidental death.[2] Often, only the necroscopic examinations corroborating the surrounding circumstances can clarify these types of cases.

Suicide is defined as death caused by a purposeful action intended to result in one's own demise. A suicide may be made to appear as a homicide or an accident, not only because of the widespread condemnation of the act, but also because insurance compensation in suicide claims can be substantially reduced.[3] The negative attitude toward suicide in the Jewish faith is demonstrated by the practice of burying people who have taken their own lives on the fringes of cemeteries as a symbol of them being taken out of the community.[4] In Jewish and Muslim communities, there is also a strong cultural and religious reluctance to perform autopsies. Thus, in addition to the normal misrepresentation of suicide cases found in Western countries, the bias is slightly greater among these religious groups, because autopsies are not always performed.[3] However, for religious Jews and Muslems, autopsy cannot be objected to on religious grounds if it is required for forensic reasons. In Israel, autopsies must be carried out in the following cases:

- death in a psychiatric institution,
- "dead-on-arrival" case in hospital emergency departments,
- victim of terrorists attacks,
- case where suspicion is raised by police investigators or members of the deceased family and
- case of suspected death by suicide, either of a civilian or soldier.

We report the epidemiologic characteristics of autopsy-confirmed suicide cases in Israel over a period of 13 years (1985–1997) and compare our findings with data from other regions.

Methods

The medicolegal records of 24 889 autopsies carried out between 1985 and 1997, inclusive, at the National Center of Forensic Medicine in Tel Aviv were retrospectively reviewed. All cases of suspected suicide in Israel are evaluated at the National Center of Forensic Medicine in Tel Aviv. A combination of medicolegal findings and circumstantial evidence was used to determine if the manner of death was, in fact, suicide. No psychopathologic data were available to the National Center of Forensic Medicine.

The cases determined to be suicide were divided into subgroups according to sex, age, marital status, cause of death and the month in which the event occurred, and descriptive statistics including mean, minimum, maximum and standard deviation for each subgroup were calculated. As this is a descriptive report on an entire population, any differences found are real (a true reflection of distribution differences). Multiple analyses of variance were used to examine any trends in the data according to the variables investigated. The Kolmogorov–Smirnov test was used to determine if the male and female subgroups differed as a function of age.

Results

A total of 2936 (11.8%) of the 24 889 autopsies conducted at the National Center of Forensic Medicine between 1985 and 1997 inclusive were determined to be suicides. During this time, there was an overall increase in suicide rates (Fig. 1). This pattern was interrupted in 1990 (15% decrease) and in 1994 (27% decrease). The increase in the number of cases was predominantly in men. As well, although there were roughly equal numbers of women and men in Israel during this time, approximately 3 times as many men than women took their own lives.

In men, suicide rates were highest in the 20- to 29-year-old group (20.6% of total) and, in women, in the 30- to 39-year-old group (16.2% of total) (Table 1). In men, suicide rates decreased steadily in each decade after the second decade; however, in women, excluding the groups with the lowest (10–19 years of age) and highest rates, suicide rates did not vary considerably across age groups (range 10.8%–14%).

There were no significant differences in suicide rates by month, regardless of sex or age (Table 2). Overall rates were lowest in February (7.2%) and March (7.3%) and highest in January (9.1%), June (9.3%) and July (9.5%).

Overall, asphyxia by hanging was the most common method of suicide (Fig. 2); firearms and jumping from heights were the second most common, and poisoning, drowning, sharp wound injuries and self-immolation ranked third in frequency. All other methods categorized in this study occurred far less frequently.

There were differences between the sexes in method of suicide. For men, hanging, firearm wounds and

jumping from heights were most commonly encountered, whereas women were more likely to take their own lives by jumping from heights, hanging and poisoning (Fig. 2).

Rates of suicide were found to differ according to marital status. The highest rates were in married (40.7%) and single (31.9%) individuals (Table 3). There is no database available from which to draw statistics on couples who were cohabiting or separated.

A comparison of the distribution of suicides by sex, age and marital status showed the largest group of those who took their own lives was widows aged 60 years and older (n = 285). Suicide was least prevalent among widowers. Among men, the largest group was single individuals aged 20–39 years.

Cause of death by age, marital status and sex was

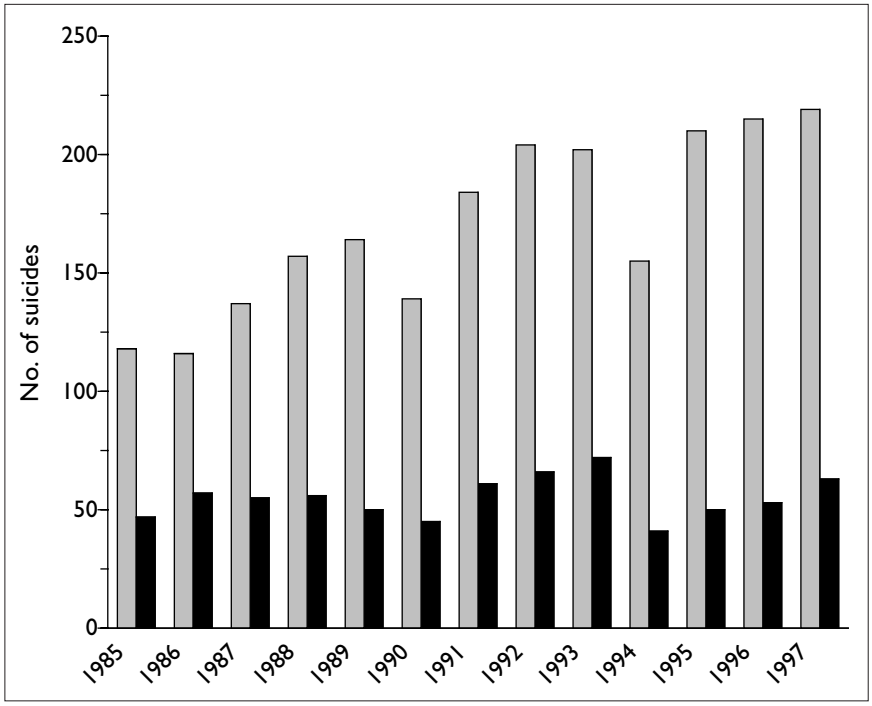

Fig. 1: Number of suicides committed by men (grey bars) and women (black bars) in Israel, 1985–1997.

Table 1: Age range of men and women who committed suicide in Israel, 1985–1997

	Sex; no. (and %) of suicides				Total no. (and %) of suicides	
Age range, yr	Male		Female			
10–19	206	(9.3)	60	(8.4)	266	(9.1)
20–29	457	(20.6)	90	(12.6)	547	(18.6)
30–39	379	(17.1)	116	(16.2)	495	(16.9)
40–49	322	(14.5)	87	(12.2)	409	(13.9)
50–59	241	(10.9)	89	(12.4)	330	(11.2)
60–69	215	(9.7)	100	(14.0)	315	(10.7)
70–79	215	(9.7)	94	(13.1)	309	(10.5)
80 and over	168	(7.6)	77	(10.8)	245	(8.3)
Undetermined	17	(0.8)	3	(0.4)	20	(0.7)
Total	2220	(100)	716	(100)	2936	(100)

Table 2: Month during which men and women committed suicide in Israel, 1985–1997

	Sex; no. (and %) of suicides				Total no. (and %) of suicides	
Month	Male		Female			
January	207	(9.3)	60	(8.4)	267	(9.1)
February	150	(6.8)	61	(8.5)	211	(7.2)
March	164	(7.4)	50	(7.0)	214	(7.3)
April	194	(8.7)	61	(8.5)	255	(8.7)
May	191	(8.6)	63	(8.8)	254	(8.7)
June	214	(9.6)	60	(8.4)	274	(9.3)
July	213	(9.6)	66	(9.2)	279	(9.5)
August	181	(8.2)	60	(8.4)	241	(8.2)
September	172	(7.7)	53	(7.4)	225	(7.7)
October	195	(8.8)	57	(8.0)	252	(8.6)
November	158	(7.1)	63	(8.8)	221	(7.5)
December	181	(8.2)	62	(8.7)	243	(8.3)
Total	2220	(100)	716	(100)	2936	(100)

also examined, and this revealed the largest group to be single individuals aged 20–39 years who committed suicide by hanging (n = 192). Other distinct groups included teenagers who shot themselves (n = 64) and widows and widowers 60 years of age and older who committed suicide by jumping from heights (n = 23).

Discussion

There are some notable differences between our findings and data from Western countries. In the United States, the suicide rate has remained fairly constant and is currently about 12.0 per 100 000;[5–7] in Israel, the rate for the same time period (i.e., 1985 to 1997) increased from 6.0 to 8.0 per 100 000.[8,9]

Although suicide rates in Israel are among the lowest in the world,[10] increased immigration from the Soviet Union and Ethiopia since 1990 has changed the suicide rate in Israel.[11] Although there was an overall increase in suicide rates between 1987 and 1990, it was moderate. The highest rates of suicide, between 1991 and 1997, coincided with massive immigration to Israel. Immigrants may be more likely to feel alienated and depressed, and this may contribute to a higher rate of suicide among immigrants than natives of either their country of origin or their adopted one.[7,12] Ponizovsky and Safro's survey of immigrants found that during the first month in Israel there was a high prevalence of suicidal ideation among those who were socially and emotionally isolated and had poor social support.[7]

The variation in the suicide rates was not correlated with population changes. The population of Israel, which in 1997 was approximately 6 million, steadily

Table 3: Marital status of men and women who committed suicide in Israel, 1985–1997

Marital status	Sex; no. (and %) of suicides				Total no. (and %) of suicides	
	Male		Female			
Single	767	(34.5)	169	(23.6)	936	(31.9)
Married	918	(41.3)	276	(38.5)	1194	(40.7)
Divorced	153	(6.9)	57	(8.0)	210	(7.2)
Widowed	158	(7.1)	153	(21.4)	311	(10.6)
Unknown	224	(10.1)	61	(8.5)	285	(9.7)
Total	2220	(100)	716	(100)	2936	(100)

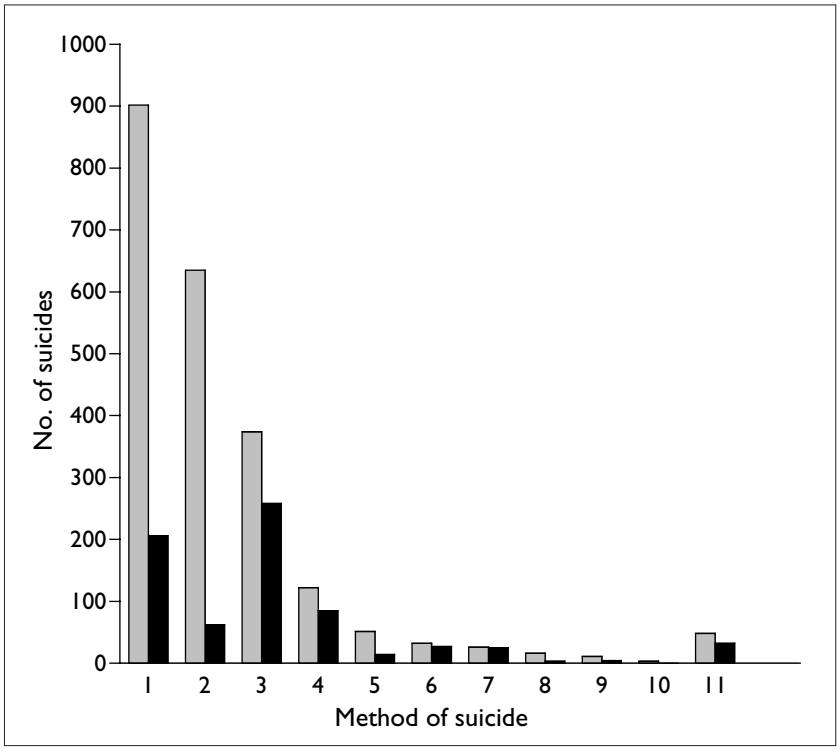

Fig. 2: Number of men (grey bars) and women (black bars) who took their own lives by various methods (1 = hanging, 2 = gunshot wound, 3 = jumping from height, 4 = poisoning, 5 = sharp wound, 6 = drowning, 7 = self-immolation, 8 = motor vehicle accident, 9 = gas inhalation, 10 = electrocution, 11 = other).

increased between 1985 and 1989 at an annual rate of about 1.6%. In 1990 and 1991, due to a massive immigration of Jewish people from the former Soviet Union and Ethiopia, the average increase was 5.5%. Between 1992 and 1997, the average yearly growth rate was 2.6%.[13] The number of autopsies carried out at the centre during the years spanning this study increased in proportion to the demographic changes noted above. However, the average increase in suicide rates between 1986 and 1989 was about 4 times the increase in the country's population. From 1990 to 1991, the average suicide rate was 6 times higher than population growth rates, and between 1992 and 1997 the average increase in suicide rate nearly equalled population growth. There were, however, fluctuations when population growth exceeded the suicide growth rates (i.e., 1989–1990 and 1993–1994).

Several international studies have found that over 90% of those who commit suicide suffer from psychiatric conditions at the time of death; they are often depressed, have alcohol abuse problems or both.[14–18] Although this study did not directly address these issues, the increase in suicide rates in Israel during the 13 years of this study may be associated with a documented increase in substance abuse in the country.[19,20] The possible link deserves further study.

The ratio of males to females who committed suicide in Israel between 1985 and 1997 (approx 3:1) was similar to that reported elsewhere[21] and to previous reports for the Israeli population, where it ranged from 2:1 to 7:1 for various age groups.[7] Higher rates of suicide are consistently reported for men, despite higher rates of depression in women. This contradiction might be explained by inadequate psychological diagnosis and treatment of depression and suicide attempts in men.[22] Our findings strengthen these assumptions. A male serotonin-related syndrome of impulsivity, acting out and depression, which may occur in men as frequently as depression does in women, may also contribute to the higher rates of suicide in men.

The highest rates of suicide in our sample were in 20- to 29-year-old men and 30- to 39-year-old women. These findings differ from data reported for the US, where most suicides by women occur after the age of 55 and by men, after the age of 69.[21] Until recently, the peak age for suicides reported in the literature was 45 years of age,[15] but there is growing evidence that elderly people are now at higher risk.[15,23]

Young men in Israel who face a period of enhanced stress and freely available weapons have been shown to be at increased risk for suicide during their compulsory military service when compared with age-matched nonmilitary men.[24] As well, the sociodemographic pattern of suicide of young men differed from that of adults. High suicide rates among males 15–24 years of age have also been reported in Australia.[23]

There seemed to be a cultural differences in the method of suicide chosen by men and women. In Israel, the primary method of suicide chosen by men was hanging, followed by the use of firearms and jumping from heights. In women, jumping from heights ranked first, followed by hanging and poisoning. These findings are similar to those reported for Hong Kong, where hanging and jumping accounted for 80% of all suicides.[23] In contrast, in the United States, the use of firearms accounted for the largest proportion (nearly 60%) of male suicides, and hanging ranked second. Women in the US were more likely to take an overdose of psychoactive substance or poison.[10] Suicide by jumping accounted for only 5% of suicides in England and Wales.[25]

Marriage rates in Israel decreased from 6.7 per 1000 population in 1985 to 6.3 in 1990 and 6.1 in 1997. Correspondingly, the rates of divorce increased from 1.3 per 1000 population in 1985 to 1.5 in 1990 and 1.7 in 1997. The rates of suicide for different marital status groups detected in this study differed from the findings reported for other countries, but were in accordance with previously reported findings in Israel.[7,17,26] Although in Israel suicides were more prevalent among married men and women, in most Western societies, suicide is more common in single individuals, followed by those who are divorced, separated and widowed, with the lowest rates reported for married subjects.[27,28]

The complexity of Israeli society, comprising natives and an increasing number of immigrants, tensions resulting from a continuous state of alert and the political upheavals during the years of this study impeded us from providing a simple explanation for the differences in suicide patterns in Israel compared with Western societies. Each one of the factors we included in this study might have had an impact on the suicide. rate. Taken together, all of the variables may, in fact, be tapping a larger confounding factor at another level (i.e., group morale). This is in line with Durkheim's concept of anomie being a morbid societal state that is closely correlated with high suicide rates.[29]

This study is limited by the fact that no data were available regarding diagnoses or psychiatric history.

Thus, psychopathological correlates may not be inferred. Further analysis of the phenomenon from a socioeconomic and psychological perspective is warranted.

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