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Self-Inflicted Burn Injuries in Kermanshah: A Public Health Problem

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Background: Around 30% of suicides are committed by burning. The problem of self-immolation remains a crisis even after population based interventions and still a considerable proportion of admissions of burn ward is belonged to suicide cases.
Objectives: This study was designed to present the epidemiologic profile of these patients and compare completed self-immolation and attempted ones.
Patients and Methods: All patients with self-immolation admitted to the burn ward of Imam Khomeini Hospital of Kermanshah were entered. The study period was from 20th March 2011 to 21th March 2012. A trained person was responsible to fill the forms by asking victims or their families. Multiple logistic regressions was applied to identify mortality risk and protective factors. Chi-squared test was used to compare attempted cases with complete ones.
Results: In total, 164 cases of self-immolation were admitted (30% of total admission to the burn center). One-hundred and forty-two were female and the median age was 25 (IQR: 21-36). The most common used substance for burning was kerosene (85%). The commonest motive of self-immolation was sadness, followed by conflict with spouse. Overall mortality rate was 38.1%. TBSA was the most important determinant of death when adjusted for age and sex. Odds ratio of death was increased by 3 percent for each percent increase of TBSA ($P < 0.0001$). There were no statistically significant differences between the attempted cases and completed ones except for TBSA, which was higher among completed cases ($P < 0.0001$).
Conclusions: Suicide is a tragic way to end life. As the most common motive was sadness, it is recommended to implement mental health programs and educate problem-solving skills to population, particularly young housekeeper girls.

Keywords: Self; Suicide; Women; Burning

1. Background

Iran as a developing country is categorized as countries whit low rate of suicide but high rate of self-immolation (1, 2). Unfortunately in Iran burn is a widely common way of suicide (3). Around 30% of suicides are committed by burning (2). Suicidal behavior incidence was reported up to 19 per 100000 people in 2005 (4). Among all methods of suicide, self-burning is the third common method after drug overdose and poisoning (4). Studies in Iran showed that it is more prevalent among Kurdish population. Ilam and Kermanshah are the first two cities with highest frequency of completed self-immolation in Iran (2). Both cities are located Western of Iran and with high proportion of Kurdish people. There is a theorem indicating that most of completed self-immolation cases do not really want to complete the suicide. They only want to attempt suicide and before committing the suicide do not think about fire violence. After they ignite the fire they cannot do anything and suicide attempt changes to completed self-immolation (1).

2. Objectives

The aim of this study was to present the epidemiologic profile of patients with suicide and compare completed self-immolation and attempted ones.

3. Patients and Methods

We collected data of all patients admitted with thermal burns. In addition, data on the intention of the injury was gathered by an interview. The interviews were performed by a trained clinical psychologist. The study period was from 20th March 2011 to 21th March 2012. Patients were considered as a cohort and followed from admission to discharge. During the study period, a registry system was established. A trained person was responsible to fill the forms by asking victims or their families. Demographic data were collected by interview with patients or their attendants. Data on injury were collected by reviewing the patient's files. Total burned body surface area was calculated using the rule of nines or the Lund-Browder

diagram. This project was approved by the research committee of Kermanshah University of Medical Sciences.

4. Results

During the study period, 164 cases of self-immolation were admitted (30% of total admission to the burn center). The median age was 25 (IQR: 21-36), ranged from 11 to 84. Patients aged 23 were overrepresented. TBSA (total burn surface area) was the most important determinant of death. Odds ratio of death was increased by 3 percent by each percent increase of TBSA (P < 0.0001). Death was more common among males but it was not statistically significant in univariable model (P = 0.23). There was no association between increasing age and death due to burn injuries. By applying multiple logistic regressions, only TBSA was identified as the main risk factor of death (Table 1).

Table 1. Characteristics of Injuries and Comparison Between Completed and Self-Inflicted Cases [a, b]

Variable	All	Completed Cases	Attempted Cases	P Value
TBSA				< 0.0001
< 20	4 (2.4)	0	4 (100)	
20-39.9	33 (20.1)	6 (22.2)	21 (77.8)	
40-59.9	40 (24.4)	8 (25.8)	23 (74.2)	
60-79.9	31 (18.9)	14 (51.9)	13 (48.1)	
> 80	56 (34.1)	26 (54.2)	22 (45.8)	
Motives				0.682
Conflict with spouse	41 (25.0)	11 (31.4)	24 (68.6)	
Economical problem	11 (6.7)	3 (51.7)	4 (42.9)	
Loss of close family	4 (2.4)	2 (50.0)	2 (50.0)	
Delusion	8 (4.9)	4 (66.7)	2 (33.3)	
Drug abuse	3 (1.8)	1 (33.3)	2 (66.7)	
Sadness	45(27.4)	15 (39.5)	23 (60.5)	
Conflict with family members	23 (14)	11 (47.6)	10 (52.4)	
Delusion because of drug abuse	2 (1.2)	1 (50.0)	1 (50.0)	
Suffering chronic disease	3 (1.8)	0	2 (100.0)	
Unknown	24 (14.6)	-	-	
History of suicide				0.283
Firs time	100 (61.0)	29 (34.5)	55 (65.5)	
Second time	17 (10.4)	6 (40.0)	9 (60.0)	
Third time	5 (3.0)	2 (40.0)	3 (60.0)	
Forth and more	10 (6.1)	4 (44.4)	5 (55.6)	
Unknown	32 (19.5)	13 (54.2)	11 (45.8)	
Family history of suicide				0.663
Close family	17 (10.4)	4 (25.0)	12 (75.0)	
relatives	35 (21.3)	10 (37.0)	17 (63.0)	
Neighborhood	15 (9.1)	5 (41.7)	7 (58.3)	
No family history	97 (59.1)	35 (42.7)	47 (57.3)	
Family history of self-immolation				0.312
Close family	12 (7.3)	3 (27.3)	8 (72.7)	
relatives	25 (15.2)	7 (36.8)	12 (63.2)	
Neighborhood	14 (8.5)	5 (58.3)	7 (58.3)	
No family history	113 (68.9)	39 (41.1)	56 (58.9)	
Burning substance				0.089
Kerosene	136 (85.5)	47 (41.2)	67 (58.8)	
Gas	7 (4.4)	0	7 (100)	
Gasoline	6 (3.8)	1 (20.0)	4 (80.0)	
Others	10 (6.0)	2 (28.6)	5 (71.4)	
Regret after self-immolation				
Yes	136 (82.9)	38 (33.6)	75 (66.4)	0.078
No	19 (11.6)	9 (56.2)	7 (43.8)	
unknown	9 (5.5)	7 (13.0)	1 (1.2)	

[a] Abbreviation: TBSA, total burn surface area.
[b] Data are presented as No. (%).

Table 2. Demographic Characteristics of Patients [a]

Variable	All	Completed Cases	Attempted Cases	P Value
Gender				0.076
Male	22 (13.4)	11 (57.9)	8 (42.1)	
Female	142 (86.6)	43 (36.4)	75 (63.6)	
Education (in patients 15 years and older)				0.390
Illiterate	36 (22.0)	12 (42.9)	16 (57.1)	
Elementary	56 (34.1)	18 (37.5)	30 (62.5)	
Secondary	35 (21.3)	13 (41.9)	18 (58.1)	
High School	20 (12.2)	3 (18.8)	13 (81.2)	
Diploma	14 (8.5)	6 (50.0)	6 (50.0)	
Age groups				0.313
< 20	30 (18.4)	11 (42.3)	15 (57.7)	
20-34	87 (53.4)	29 (42.0)	40 (58.0)	
35-49	31 (19.0)	8 (28.6)	20 (71.4)	
50-64	12 (7.4)	3 (30.0)	7 (70.0)	
> 65	3 (1.8)	2 (66.7)	1 (33.3)	
Job				0.331
Housewife	109 (68.1)	31 (60.8)	59 (71.1)	
Unemployed	26 (16.3)	11 (21.6)	11 (13.3)	
Self-employed	13 (8.0)	6 (11.7)	5 (6.0)	
Employed	2 (1.3)	1 (2.0)	1 (1.2)	
Student	10 (6.3)	2 (3.9)	7 (8.4)	
Marital status				0.017
Single	87 (53.4)	24 (45.3)	55 (66.3)	
Married	69 (42.3)	26 (49.1)	24 (28.9)	
Divorced	5 (3.1)	1 (1.9)	4 (4.8)	
Widow	2 (1.2)	2 (3.8)	0	

[a] Data are presented as No. (%).

Table 3. Probability of Death, Crude and Adjusted Odds Ratio of Death Among the Burn Patients

Variable	Probability of Death, %	Crude Odds Ratio (95% Confidence Interval)	P Value	Adjusted Odds Ratio (95% Confidence Interval)	P Value
Gender			0.082		0.234
Male	57.9	2.39 (0.89-6.42)		1.91 (0.66-5.53)	
Female	36.4	1		1	
Age		0.99 (0.96-1.02)	0.676	1 (0.97-1.03)	0.997
TBSA		1.03 (1.01-1.05)	< 0.0001	1.03 (1.01-1.04)	< 0.0001

Common motive of self-immolation was sadness followed by conflict with spouse. Among married women, conflict with spouse was the most common motive (43.5%), and among single females were sadness (35.5%) followed by conflict with family members (27.4%). Among males, sadness (25%) followed by addiction (10%) were the most common motives. There were no statistically significant differences between the attempted cases and completed ones regarding mentioned variables except for total body surface area, which was the main risk factor of death (Tables 2 and 3).

5. Discussion

We aimed to describe demographic characteristics of patients committed self-immolation as a way of suicide. A considerable proportion of admission to burn center was self-immolation consistent with some other studies in Iran (5-7). Most of them were women, housewife with low literacy and a half were younger than 25 years. More than a half had TBSA of more than 60, and around 40% of the patients died. TBSA was the main determinant of death. There were no significant differences between the attempted and completed cases. In Iran, most of the patients are married housewife women. They did not attain high level of education with low socioeconomic status (8, 9). Although, in the study of Ahmadi, around a half of participants were single, around 85 percent were illiterate or low literate and more than 75% were housekeeper (3). Alaghehbandan et al. found an inverse association between educational level and the risk of self-immolation, as with increasing educational attainment the risk of self-burning

was decreased (10). In our study, one of five patients were illiterate and 34.1% had attained elementary level. Among married women, 94% were housekeeper and among single women, 86% had no job and were unemployed. There are some evidences indicating that self-immolation may become contagious (1). People learn it from each other or previous generations. In the present study, one of three had seen this phenomenon in their close family, relatives or neighbors. As we examined only one group (the self-immolation cases) and there was no comparison group we cannot conclude this statistically. It could be a risk factor and may help to define high-risk groups. Establishing preventive services in neighbors' with high frequency of self-immolation may be effective. Making videos of burning and motives of previous patients and their problems after surviving is recommended as a short-term strategy to reduce the rate in the general population. Changing the current culture about divorce and convincing families to support their young girls when facing problems in their private life are considered as long-term strategies.

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Authors' Contributions

All the authors made substantial contributions to the following: conception and design of the study, data acquisition, analysis and interpretation; drafting of the manuscript and its revision; final approval of the manuscript.

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