



Performance Appraisal of Tehran Firefighting Stations in Attempted and Threatening Suicide with National and Global Standards (The First 6 Months of 2018)

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Abstract

Background: We aimed to compare the performance of Tehran firefighting stations in the incidents of suicide attempt and threats among Tehran citizens using international standards.

Methods: A research method was a descriptive-analytical study based on library studies. The data were analyzed by descriptive and inferential methods such as single group t-test and independent t-test. The statistical population of this study included all citizens in 22 districts of Tehran City that committed or threatened to commit suicide in the 2018 year. They were selected in a targeted manner. All data were extracted and analyzed through the fire department in the first half of 2018 in the action and threat of suicide.

Results: Men commit suicide more than women do. Moreover, the average time of exit from station and the average travel time are shorter than Iranian and world standards. The people saved by firefighters outnumber the people who died in suicide, which indicates the satisfactory performance of firefighters in relief and rescue operations. In suicide operations, according to the general results obtained from statistical calculations of departure time from the station and the average travel time, which are the two main factors in evaluating the performance of firefighters in suicide accidents, which in comparison with international standards. It was significantly lower and the performance of firefighters was positive.

Conclusion: The average duration of exit from station and the average travel time, are significantly lower than international standards, which demonstrates the good performance of firefighters.

Keywords: Suicide; Rescue and relief; Firefighter; Iran



Introduction

Suicides do not always occur in the context of mental illness (1). According to the statistics of the WHO, suicide is the third most frequent cause of mortality in the ages between 44 and 62 (2, 3). In the United States, one in six young people has considered suicide in their lifetime, and 5.5 percent have attempted suicide. Suicide rates in Iran are lower than in the rest of the world; so that this figure in Iran was about five people per 100,000 people, while in the world the figure is more than 12 people per 100,000 people. Therefore, thinking about suicide is an important step in suicide process, recognized as a significant risk factor for suicide attempt and completed suicide (4,5). It is often committed because of disappointment, explained by mental problems, depression, bipolar disorder, schizophrenia, love failure, alcohol addiction, and drug use. One American dies from suicide every 12.8 min, making suicide the tenth leading cause of death in the United States according to the American Foundation for Suicide Prevention (6). In most cases, stress factors such as financial problems or interpersonal problems play a significant role in suicide. People committing suicide often share certain behavioral characteristics; they are at a low economic level and suffer depression. Most subjects did not consider suicide as a reasonable option even in cases of a serious and incurable disease (7).

Suicide is the second leading cause of death for youth aged 10–24 (8). No significant difference exists in the frequency of narcotics in the corpses left from either suicide or murder (9). According to the interpersonal theory of suicide, repeated exposure to painful or provocative experiences is associated with lethal or nearly lethal suicide attempts (10). There is a high frequency of narcotics, drugs and poisons in the corpses left from murder and suicide, which is undoubtedly effective in determination of death reason and inaccurate response in judicial cases (9). Nondisclosure of suicidal thoughts limits suicide

risk management (11). The most important risk factors are anxiety, excitement, sleep problems, interpersonal problems, work pressure, physical diagnoses, isolation, and family records of mental disorders (12).

The incidents of suicide attempt and threat are among the major incidents to which firefighters are dispatched. In such incidents, firefighters need to be good psychologists and invite the person to peace by speaking to prevent suicide. Where the person is determined to commit suicide, they need to place rescue blankets in the specified location to save the person (13, 14).

These operations are executed based on the type of suicide incidents divided into attempt and threat to suicide. In NFPA1720 Standard (15), the time of incident response follows the minimum number of persons to respond to the incident, population of the region, and the applicant's location. This process lasts from the alarm sound going off to arrival of the first firefighting vehicle at the location and getting access to the intended person. Suicide constituted 10.3 out of every 100000 deaths in 2013, with 475 people committing suicide in the city in the same year (16). Suicide is the second most common cause of mortality among people between the age of 10 and 24 in the US (17). Rigorous suicide prevention research is critically needed, as suicide is the second leading cause of death among adolescents and young adults in the USA (18). Sadeghi et al (19) studied the viewpoints of sociologists and psychologists and concluded that suicide is explained by individualism and the loss of social relationships as the consequence of changing traditional culture into modern culture.

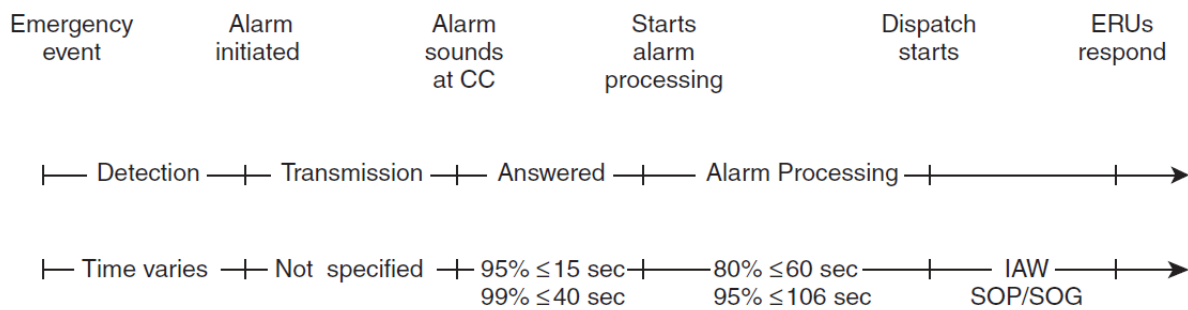
Some of the people who attempt suicide are saved by different forces, including firefighters. Since the life of citizens is given top priority, firefighters have to get the location of incident in the shortest possible time and provide help to the intended people. So far, different intra-organizational rules and instructions and international standards in

various domains of firefighters' performance have been defined. Therefore, it is necessary to analyze the performance of firefighters in the incidents of suicide attempt and threat using these standards. Since few studies have been done in this regard, the present research attempts to answer this question: Does the performance of firefighters in 22 districts of Tehran city conform to national and international standards? Tehran Firefighting Organization is responsible for saving the lives of Tehran citizens with over 130 single-purpose firefighting stations (fire) and two-purpose firefighting stations (rescue and fire). This study aimed to analyze the performance of Tehran firefighters in the incidents of suicide attempt and threat. We are going to compare the performance

of firefighters with Iranian and international standards and provide efficient solutions for reducing the time of dispatching firefighters to suicide locations.

We aimed to answer the question of "how is the performance of Tehran firefighting stations in the incidents of suicide attempt and threat among Tehran citizens evaluated according to national and global standards?"

Fig. 1 illustrates the process of dispatching forces from the moment of notification to command center (125 system) to the threshold of response to incident and execution of standard operating procedures (SOP) and Standard Operating General (SOG) methods according to NFPA 1720 standard.



Notes:

- (1) Alarm sounds are audible or visual annunciation, or both.
- (2) CC: Communications center.
- (3) TC: Telecommunicator.
- (4) IAW: In accordance with.
- (5) Alarm processing begins when the alarm is answered by the telecommunicator, includes interrogation of the caller, and ends at the beginning of ERF/ERU notification.

Fig. 1: Alarm Time Line Where Primary PSAP Is Communications Center

Materials and Methods

Study design and population

In terms of nature and method, this descriptive-analytical research was based on library studies. To achieve the goals of this research, we extracted all information and documents connected with suicide attempt and threat in the first half of 2018 through operation information system of Tehran Firefighting Organization. We also used

international standards and domestic instructions. The statistical population of this study included all citizens of Tehran city and the research samples were 220 people committing or threatening to commit suicide in 22 districts of Tehran City in the first half of the year 2018. Hotline callers do not always have suicidal ideation and previous studies have noted that the rate of such callers is limited (20). In order to process suicide prevention trend, we needed to identify the concept of this behavior

and its specifications. After studying 209 cases of suicide attempt and threat in operation system of Tehran Firefighting Organization in the first half of the year 2018, including successful and unsuccessful attempts, we explored different variables such as contact time, operation type, operation district, station, coordination duration, exit duration, travel duration, operation duration, municipality district, occupation type, amount of loss, lost people, saved people, reason of suicide, and age, as illustrated in Table 1. According to NEPA 1710, (<http://www.nfpa.org>), standard time of exit from station is 80 sec for firing and 60 sec for emergency incidents. In this standard, travel time is 240 sec or less for initial response to emergency incidents. According to NFPA 1720, the area where the accident occurred is divided into four levels: urban, suburban, rural, failure and error with specific risks. Response time varies from 9 to 14 min depending on the coverage level

of the region. In certain cases, response time is determined by a legal authority based on the distance and dangers of special regions.

Statistical analysis

The data were analyzed by descriptive statistical methods including frequency, percentage, table and diagram and inferential statistical methods including single group t-test and independent t-test using SPSS ver.22 Software (IBM Corp., Armonk, NY, USA).

Results

The results were obtained from demographic information of the samples, including age, suicide location, lost and saved people, response time, exit from station, and travel time.

Table 1: Demographic information of samples

<i>Age (yr)</i>	<i>N</i>	<i>Suicide Location</i>	<i>N</i>	<i>Gender</i>	<i>N</i>	<i>Lost People</i>	<i>N</i>	<i>Saved People</i>	<i>N</i>
14-24	29	Residential/Apartment	155	Male	122	Male	5	Male	117
25-34	48	Passages, Flyovers, etc.	41	Female	73	Female	3	Femal e	70
35-44	45	Highway	3						
45-54	6	Parks	3						
55-64	6	Office buildings/ Public places (subway, etc.)	4						
56-74	1								

Based on this study, we estimated the frequency of people committing suicide in 22 districts of Tehran city. Fig. 2 illustrates the frequency of suicide points separated by municipality districts.

Average coordination time in command center

This time is the duration from contacting a firefighting center to alarming in the station for dispatching forces to the location. The average time of coordination in command center for the incidents of suicide attempt and threat is 54.94 sec. The shortest coordination time is 0 sec and the longest time is 337 sec.

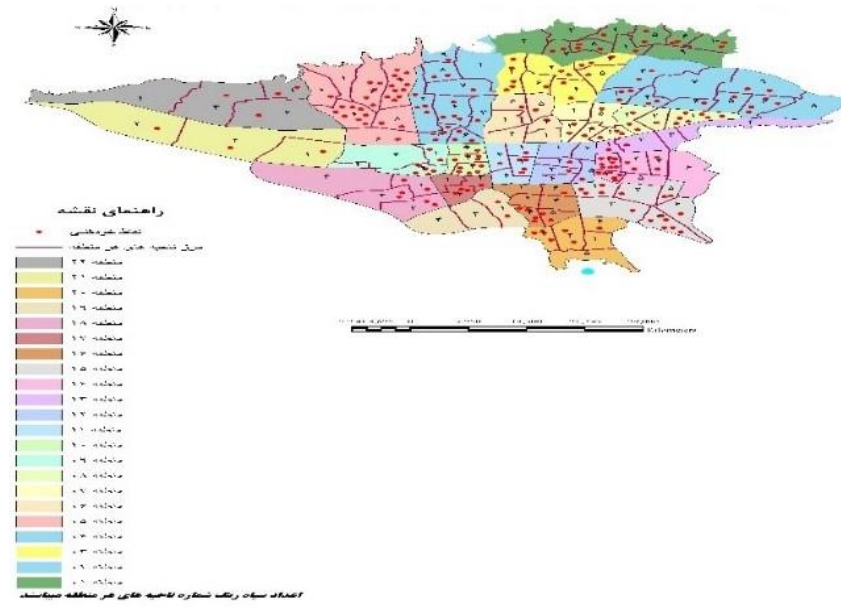


Fig. 2: Frequency of suicide points in 22 districts of Tehran city separated by municipality districts

The average time of exit from station in Tehran and World

According to the instructions issued by operation department of firefighting organization, the average time of exit from station in Tehran is 35 sec during the day and 45 sec at night. According to this study, the average exit time is 30.34 sec,

with the shortest time being 9 sec and the longest time being 96 sec. In international standards (NFPA 1710), exit time for incidents as suicide is 60 sec. As you can see in Table 2, In other words, average exit time in the incidents of suicide attempt and threat in Tehran city is significantly less than domestic and international standards.

Table 2: Comparison of the average time of exit from station with domestic and international standards in day and night

N	Mini exit time	Max exit time	Mean (sec)	Standard test value in day (sec)	Standard test value in night (sec)	Standard test value in world (sec)	d.f	T (day)	T (night)	T (world)	Sig
191	9	96	30.3	35	45	60	190	-4.36	-13.74	-27.81	.001

Average travel time (duration of reaching the location of incident) in Tehran and World

Travel time standard in Tehran Firefighting Organization is 300 seconds. The average travel time is 279.45 sec, with the longest time being 986 sec and the shortest time being 1 sec. The average travel time is 279.45 sec, average domestic standard is 300 sec, t=-2.413, the world standard is 480 sec

with t=-23.55, freedom degree of 190, and significance level of .001, which is smaller than 0.05. Therefore, there is a significant (P< 0.01) statistical difference between the average times. In other words, average travel time in the incidents of suicide attempt and threat in Tehran City is significantly (P< 0.01) less than domestic and international standards (Table 3).

Table 3: Comparison of the average travel time with domestic and international standards

<i>Number</i>	<i>Mini travel time</i>	<i>Max travel time</i>	<i>Mean (sec)</i>	<i>Domestic standard test value (sec)</i>	<i>International standard test value (sec)</i>	<i>d.f</i>	<i>T (domestic)</i>	<i>T (international)</i>	<i>Sig</i>
191	1	986	279.45	300	480	190	-2.413	-23.55	.001

Average Operating Time

In a metropolitan city like Tehran, operating time depends on different factors such as incident situation, incident time, weather conditions, traffic conditions, and access ways. Therefore, no specific standard can be defined. In this study, the average operating time was 1630.94 sec, with maximum time being 9236 sec and minimum time being 1

second. As shown in Table 4, the average loss inflicted is 268 \$, which includes bodily and financial (direct and indirect) losses. Due to the broadness of incident, indirect losses such as losses inflicted upon the society and individuals, disability, death and injury were not calculated in this research. The biggest cost is 41667\$ and the lowest cost is 0.

Table 4: The average operating time (second) and the losses inflicted in operations (\$)

<i>Number</i>	<i>Mini operating time (sec)</i>	<i>Max operating time (sec)</i>	<i>Average operating time (sec)</i>	<i>Smallest loss (\$)</i>	<i>Biggest loss (\$)</i>	<i>Average loss (\$)</i>
191	1	986	279.45	0	41667\$	268 \$

The number of saved and lost men and women

Overall, 70 out of 73 women attempting suicide in the first half of the year 2018 have been saved. A significant ($P < 0.01$) statistical difference exists between suicide among men and women (Table 5). The diagram for the rate of successful and unsuccessful suicides between two genders is always asymmetrical. This statistical difference also exists between different countries. Statistics suggest that the amount of successful suicides among men is higher than among women. In Tehran, 117 out of 122 men attempting suicide in the first half of the year 2018 have been saved, with 5 people being lost.

Number of injured people

Thanks to the good performance of firefighters in suicide incidents, various factors have contributed

to the reduction of injuries. Among these factors we can mention the preventive measures and immunization by using rescue equipment. In this research, 26 people suffered injury and were taken to medical centers by emergency personnel.

Average Suicide Age

Suicide age is an important factor for prevention and finding the roots of suicide. In this study, the average age of suicide among Tehran citizens was 32, with minimum age being 14 and maximum age being 73.

Suicide rate per region

Suicide rates in Iran are lower than in the rest of the world, as the number in Iran was around five in every 5,000 people, while in the world there are more than 2 in every 6,000.

Table 5: The rate of suicide attempt and threat per 100,000 people in 22 districts of Tehran, Iran

<i>Suicide attempt rate per 100,000 people per Area</i>	<i>Number of suicides per Area</i>	<i>Location number of each area</i>	<i>Area Municipality</i>
P ₁ =2.63	13	493000	1
P ₂ =3.0321	21	692579	2
P ₃ =4.5454	15	330000	3
P ₄ =1.8661	15	803789	4
P ₅ =3.3856	29	856565	5
P ₆ =1.1933	3	251384	6
P ₇ =2.5625	8	232194	7
P ₈ =2.7634	11	398080	8
P ₉ =5.0497	8	158425	9
P ₁₀ =3.9755	13	327000	10
P ₁₁ =2.133	7	328176	11
P ₁₂ =1.252	3	239611	12
P ₁₃ =0.6857	2	291632	13
P ₁₄ =3.7164	18	484333	14
P ₁₅ =2.4261	16	659468	15
P ₁₆ =2.4357	7	287387	16
P ₁₇ =1.7962	5	278354	17
P ₁₈ =1.6706	7	419000	18
P ₁₉ =0.8	2	250000	19
P ₂₀ =1.7631	8	453740	20
P ₂₁ =1.7641	3	170000	21
P ₂₂ =1.6	4	250000	22

Discussion

Prioritizing Suicide Research Can Help Lead to Fewer Suicide Attempts and Deaths (21). Despite the widespread acknowledgement by public health organizations that media reporting matters to suicide, this link has been much debated and the mechanisms undergirding it poorly understood (22). Broader and more in-depth approaches are still needed to further our understanding of suicidal phenomena (7). The statistical population is among the citizens of Tehran and the sampling of the study was purposefully selected from 220 cases of attempted suicide and suicide threats in 22 districts of Tehran in the first half of 2018. Processing the process of suicide prevention requires the semantics of this behavior and famili-

arity with its characteristics, so after reviewing 209 cases of suicide threats in the operation system of Tehran Fire Department in the first half of 2018, including successful and unsuccessful suicides.

In this research, we compared the performance of Tehran fire stations in the incidents of suicide attempt and threat using national and international standards. The results of this study revealed that a significant difference exists between the average time of exit from station and domestic standards during day and night (Table 4). In other words, the duration of exit from station is significantly less than the national and global standards. Moreover, the average travel time was less than domestic and international standards. In other words, the duration of travel from station in the incidents of suicide attempt and threat in Tehran city is significantly less than the national and international

standards (Table 5). In a metropolitan area like Tehran City, operating time depends on different factors such as incident situation, incident time, weather conditions, traffic, and access ways. According to Table 6, the average operating time is satisfactory, which indicates the timely action of firefighters for saving the lives of Tehran citizens. It is noteworthy that operating time may vary depending on the type of suicide and the use of equipment. There is a significant difference between the number of suicides among men and women and the diagram for unsuccessful suicides among the two genders is always asymmetrical. The rate of suicides is at its highest level in nearly 30 years (23). Thanks to the timely action of firefighters in suicide incidents of Tehran city, 117 out of 122 men attempting suicide in the first half of the year 2018 have been saved, with 5 people being lost. 26 people suffered injury and were taken to medical centers by emergency personnel. The average age of suicide in Tehran city is not in line with Schwartz (24). Research, being above it by four years. Suicide in Tehran out of 122 men who attempted suicide in the first half of 2018, 117 survived and 5 died, although 26 suffered superficial and non-superficial injuries that were taken to medical centers by emergency personnel. Moreover, the results of this study are not in line with Hajebi et al (25) research, with the highest frequency being in the age range of 25-40. According to these figures, men have the biggest share of suicide. The people saved by firefighters outnumber those lost in the process, which indicates the good performance of firefighters in relief and rescue operation. Among the reasons for suicide among Tehran citizens, one can refer to family disputes, drug use, love failure, and economic pressures, which are in line with Shojaeizand et al. research (13). The results of table 6 show that the highest suicide rate is related to Tehran 9th district ($P9=0.5497$) and the lowest suicide rate to Tehran 19th district ($P19.8$). According to our results, the lowest age of suicide among Tehran citizens was 14 and the highest age was 73 yr, which suggests the frequency of suicide in different ages.

Limitations of the study

This investigation had limitations regarded in describing the data. Participants were evaluated by library studies, operation information system and international and domestic standards, not be enough appropriate to get accurate data. Recognizing that the present study was carried out among the citizenships of Tehran City, discretion should be held to generalize the results.

Conclusion

Among the limitations and challenges faced by firefighters while being dispatched to suicide incidents were difficulty in passing through narrow passages, lack of common language and structure, traffic, crowdedness in rescue operations, and the long-distance from rescue stations. Firstly, it is recommended to take effective measures for developing the public culture so that people avoid crowding the suicide location. Secondly, it is recommended to establish an integrated command system (ICS) with common structure and language between all forces involved in relief and rescue operation. Thirdly, it is recommended to establish, develop and increase the number of rescue stations in Tehran Firefighting Organization. Fourthly, it is recommended to establish specific paths in the city of Tehran to minimize the time of reaching the incident location.

Ethical considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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Nil.

Conflict of interest

The results of this study are not in conflict with the interests of any organization.

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