

# Gender differences in suicide methods in turkey

## Abstract

**Objective:** The purpose of the study to investigate whether there is gender difference in suicide methods and whether there is any variation in suicide methods by gender over time.

**Method:** Secondary data about suicide from 2007 to 2015 were obtained from Turkish Statistical Institute. Gender specific suicide rate was calculated. Then, a paired-samples t-test was conducted, the ratio of male to female and average of each suicide method rate were calculated, and trends about suicide methods by gender between 2007 and 2015 were graphed.

**Results:** Except for intoxication, all other suicide methods including hanging, firearm, jumping, and cutting/burning differ statistically significant between females and males. From 2007 to 2015, males are inclined to use firearms, jumping, intoxication, and cutting/burning more frequently whereas females have tendency to use jumping more frequently.

**Conclusions:** Suicide methods differ between females and males. Males use more brutal suicide methods compared to females.

**Keywords:** suicide method, gender, hanging, jumping, firearm, cutting/burning, intoxication

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## Introduction

Suicide, the act of killing oneself intentionally<sup>1-3</sup> is one of the most serious problems in the world. Every year, about 800,000 people die by committing suicide (WHO [World Health Organization], 2016). The global suicide rate is 16 per 100,000 population.<sup>4</sup> As in most countries, death by suicide is also a serious problem in Turkey, which accounts for between 4.6% and 24.3% of deaths annually.<sup>5</sup> Indeed, on average, the suicide rate in Turkey was 4.1 per 100,000 people between 2007 and 2015 (Turkish Statistical Institute (TUIK), 2017). Beyond reasons for suicide and individual tendency for suicide, availability and accessibility of a suicide method is the key factor that leads to translation of suicidal thoughts into suicidal acts.<sup>6</sup> Most importantly, the lethality of chosen suicide method has huge impact on the outcomes of suicidal acts.<sup>6-8</sup> Numerous studies suggest that firearms, hanging, jumping, car exhaust gas, vehicular impact, and drowning are the most lethal suicide methods whereas poisoning/drug overdose, and cutting/piercing are the least lethal suicide methods.<sup>9-12</sup>

A number of studies indicate that males are more likely to commit suicide compared to females.<sup>13-24</sup> The reason for the higher suicide rate among males compared to females is that males use more lethal suicide methods such as firearms and hanging whereas females choose less lethal suicide methods such as poisoning.<sup>25-27</sup> Previous studies suggest that suicide methods differ significantly between males and females in different countries based on the availability, accessibility, and culturally acceptability of suicide methods.<sup>28</sup> For instance, in the U.S., the most common suicide methods used by males are firearms (nearly 58.0%) and hanging (nearly 23.0%) whereas the most common suicide methods used by females are intoxication (39.1%) and firearms (31.0%).<sup>4</sup> In New Zealand, males (61.3%) used highly lethal suicide methods (hanging, vehicle exhaust gas, firearms, jumping) whereas females (92.4%) used less lethal suicide methods, particularly self-

poisoning.<sup>9</sup> In Serbia, hanging and firearms are used by males more frequently (62.8% and 18.7% respectively) whereas the most common suicide methods used by females are hanging (58.4%) and poisoning (19.3%).<sup>29</sup> Females in western countries tend to use poisoning, while females in Japan prefer hanging.<sup>30</sup>

Suicide methods may also differ significantly between males and females in Turkey. Although there are some studies about gender differences in suicide in Turkey,<sup>22</sup> gender differences in suicide methods is not sufficiently investigated. The questions remained unanswered are whether the trend about suicide methods by gender differs over time and whether suicide methods differ significantly between females and males. It is important to examine empirically the trend in suicide methods over time and gender differences in suicide method to develop specific intervention plan to prevent suicide. To fill the gap in the literature, this study addresses two research questions:

- i. Do suicide methods significantly differ between males and females?
- ii. Is there any variation in the trend in suicide methods by gender over time? The results may have important policy implications.

## Method

### Data

Secondary data were used for the analysis. The data were extracted from the Turkish Statistical Institute (TUIK) website. Turkish Statistical Institute is authorized to collect official statistics from the other governmental agencies.<sup>31</sup> Three different data for each year from 2007 to 2015 were obtained from the TUIK website: number of suicide cases by gender, suicide methods by gender,<sup>32</sup> and population by gender.<sup>33</sup> Then, three data were merged.

## Measures

Suicide method had ten categories (1=hanging 2= taking chemicals 3=throwing from a high place 4=drowning 5=firearm 6=burning 7=sharp instrument 8=natural gas, jpg etc. 9=throwing off a train or another motorized vehicle 10= other). The categories including taking chemicals and natural gas, jpg etc were combined to a new category called "intoxication". The categories including "sharp instrument" and "burning" were combined into a new category called "cutting/burning". The categories including "throwing from a high place", "drowning", and "throwing off a train or another motorized vehicle" were collapsed into one category called "jumping". The new categories of suicide method had five categories (1=hanging 2=intoxication 3=firearm 4=jumping 5=cutting/burning). The category of "other" was excluded due to small number of suicide cases. Gender was measured as male and female. To control for the effects of differences in gender distributions, instead of crude suicide rate, gender specific suicide rate for each year was calculated by using direct standardization method.<sup>35</sup> Direct method takes into consideration of population differences for specific groups. Crude or unadjusted suicide rate is simply the number of suicides divided by the population at risk, and multiplied by generally 100,000.<sup>35</sup> A gender specific suicide rate is simply a crude suicide rate for a specific male or female group.<sup>35</sup> In other words, gender specific suicide rate was calculated by dividing the number of suicides for male and female by their corresponding population and multiplying by 100,000.

## Analytical strategy

The analyses consisted of several stages: First, a descriptive statistics about suicide cases and suicide methods was provided. Second, a paired-samples t-test was conducted by using Stata 14.1 version to test whether suicide methods significantly differed between females and males. In addition, the ratio of male to female was calculated. Furthermore, average of each suicide method was taken between 2007 and 2015 and compared with each other. Finally, trends about suicide methods by gender between 2007 and 2015 were graphed. Specifically, a graph was produced for each suicide method by gender.

**Table 2** The Results of paired-samples t-test and male / female ratio per 100,000 people (2007-2015)

Variables	Male		Female		Mean Diff	t	p	Male / Female Ratio
	M	SD	M	SD				
Firearms	1.69	0.15	0.37	0.05	1.32	24.7	0	4.5
Cut/stab/burn	0.11	0.04	0.03	0.01	0.08	5.3	0.001	4.3
Hanging	2.85	0.24	1.16	0.07	1.69	19	0	2.5
Jumping	0.57	0.09	0.41	0.07	0.17	10.1	0	1.4
Intoxication	0.33	0.06	0.29	0.19	0.04	0.9	0.385	1.1

In addition, the results also indicated that the ratio of male to female per 100,000 people was 4.5 times higher for firearm, 4.3 times higher for cutting/burning, 2.5 times higher for hanging, 1.4 times higher for jumping, and 1.1 times higher for intoxication. The ratio of male to female suggests that males prefer the most brutal suicide methods compared to females. Figure 1 illustrates the comparison of average of suicide methods per 100,000 people between males and females. Males used all suicide methods including hanging, firearm,

## Results

Table 1 presents the suicide cases and suicide methods used from 2007 to 2015. The total number of people who committed suicide between 2007 and 2015 was 26,244. Of them, 73.3% (n=19,238) were males, 29.7% (n=7,798) were females. Of suicide methods, hanging was the most common method used (51.3%), followed by firearms (26.5%), jumping (12.6%), intoxication (7.8%), and cutting/burning (1.8%). Table 2 presents the results of the paired-samples t-test. The results indicated that except for intoxication (t(8)=0.9, p=0.385), suicide methods including hanging (t(8)=19.0, p<0.001), jumping (t(8)=10.1, p<0.001), firearms (t(8)=24.7, p<0.001), cutting/burning (t(8)=5.3, p=0.001) differed statistically significantly between males and females. More specifically, the average of suicide methods used by males per 100,000 people including hanging (M=2.85, SD=0.24), firearms (M=1.69, SD=0.15), jumping (M=0.57, SD=0.09), intoxication (M=0.33, SD=0.06), and cutting/burning (M=.11, SD=.04) was greater than the average of suicide methods used by females including hanging (M=1.16, SD=0.07), firearms (M=0.37, SD=0.05), jumping (M=.41, SD=0.07), intoxication (M=0.29, SD=.19), and cutting/burning (M=0.03, SD=0.01).

**Table 1** Suicide cases by gender and suicide methods (2007 - 2015) (N=26,244)

Variables	Attributes	n	%
Gender	Male	19238	73.3
	Female	7798	29.7
Suicide Method	Hanging	13472	51.3
	Firearms	6961	26.5
	Jumping	3308	12.6
	Intoxication	2045	7.8
	Cutting/Burning	458	1.8

jumping, intoxication, and cutting/burning more than females. Males committed suicide by hanging most, followed by firearm, jumping, intoxication, and cutting/burning whereas females committed suicide by hanging most, followed by jumping, firearm, intoxication, and cutting/burning. Hanging and firearm were the most common suicide methods used by males respectively whereas hanging in particular and jumping were the most common suicide methods used by females. Cutting/burning and intoxication were the least common suicide

methods used by both gender. Except for firearm and jumping, suicide methods including hanging, intoxication, and cutting/burning were in the same order in both gender. However, firearm was the second most common method used by males whereas it was the third common method used by females. Jumping was the third common method used by males whereas it was the second common method used by females.

Figure 2 illustrates the trends about suicide methods by gender per 100,000 people between 2007 and 2015. Suicide methods by gender differed over a decade. In the most recent years, there was a decline in suicide by hanging by both gender. Specifically, although there was fluctuation in the use of hanging among males, there was a slight decrease in the recent years. However, hanging by females to commit suicide steadily decreased slightly. Suicide by firearm increased

among males whereas it remained roughly stable among females. There was an increase in suicide by jumping by both gender. Suicide by intoxication by male decreased by 2012, and then increased and remained stable while sharp decrease in suicide by intoxication by females was observed from 2007 to 2009, and there was fluctuation between 2009 and 2012, then remained roughly stable. Suicide by cutting/burning among males increased dramatically after 2011 whereas it dropped among females. Overall, in the most recent years, among males, there was an increase in suicide by firearms, jumping, intoxication, and cutting/burning whereas there was a decrease in suicide by hanging. Among females, suicide by hanging, firearms, intoxication, and cutting/burning decreased whereas suicide by jumping increased.

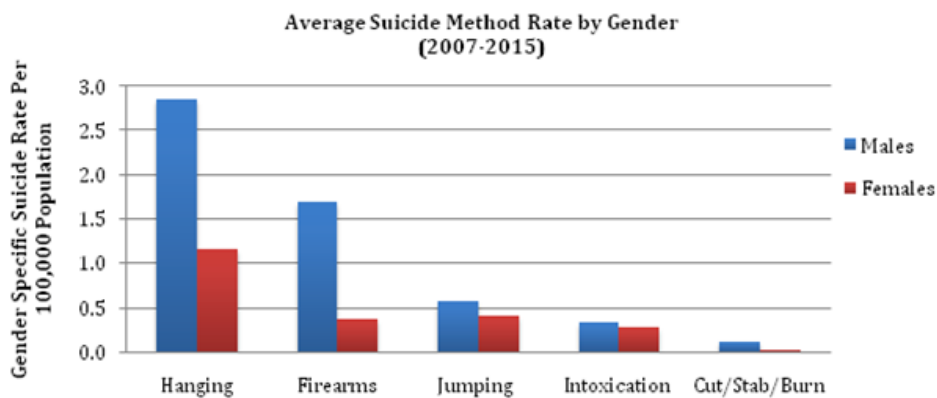
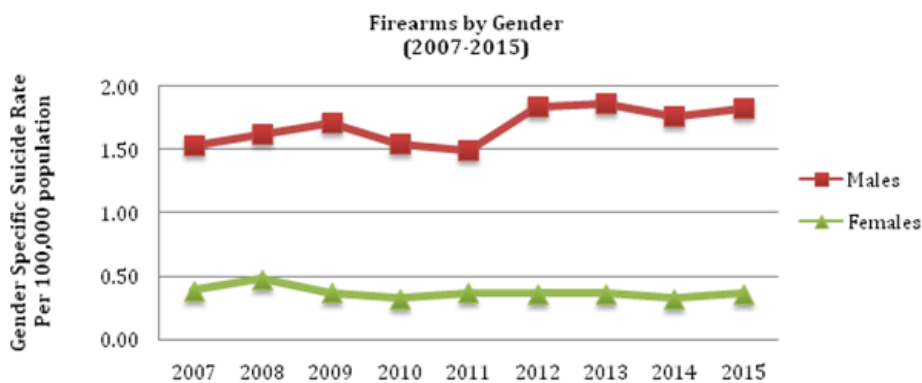
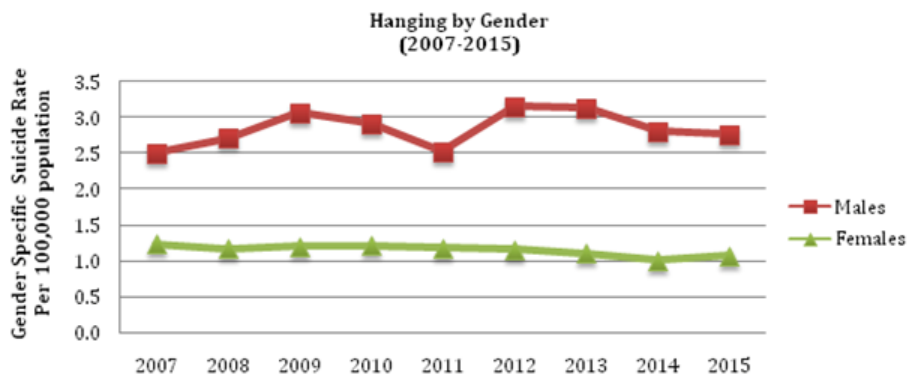
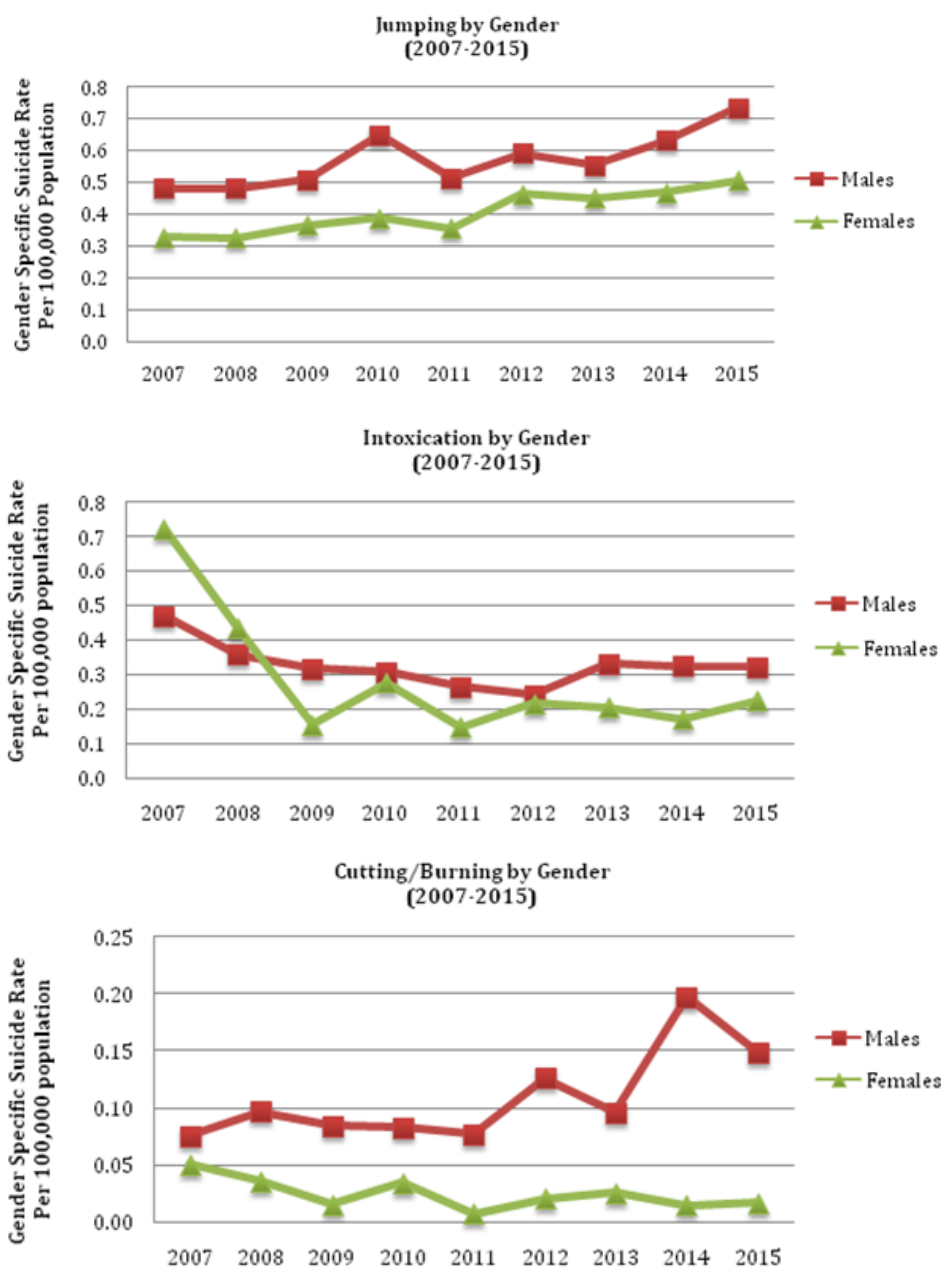


Figure 1 Average suicide method rate by gender per 100,000 people.





**Figure 2** Suicide method by gender per 100,000 people between 2007 and 2015.

## Discussion and conclusion

The current study focused on gender differences in suicide methods in Turkey. More specifically, it investigated whether suicide methods differed significantly between females and males and whether the trend about suicide methods by gender differed over time. The results indicated that that except for intoxication, other suicide methods including firearms, jumping, hanging, and cutting/burning significantly differed between females and males. The ratio of male to female suggested that compared to females, males used more brutal suicide methods such as firearm and cutting/burning. The results about the trend about suicide methods showed that in recent years, males were inclined to use firearms, jumping, intoxication, and

cutting/burning more frequently whereas females had tendency to use jumping more frequently.

The results are consistent with some of the previous literature. In other words, males are more likely to choose more lethal suicide methods compared to females.<sup>4,9,29,30</sup> The results are similar to the findings of the study that was conducted in Serbia.<sup>29</sup> Specifically, in both countries, hanging and firearm were the most common suicide methods used by males whereas hanging was the most common method used by females. However, the findings of the current study are not consistent with some of the results of the studies that were conducted in the US<sup>4</sup> and New Zealand.<sup>9</sup> Specifically, in both countries, intoxication was the most common suicide method used by females

whereas hanging was the most common suicide method used by females in Turkey. In the U.S., firearm was the most common method used by males whereas males use hanging mostly to commit suicide in Turkey. The present findings have a number of practical policy implications. Reducing the availability and restricting accessibility of suicide methods may decrease suicide rates.<sup>35-38</sup> Specifically, legislation restricting access to firearms such as stricter gun control policies, which makes it difficult to purchase and sell, may lower the suicide completion rates.<sup>39-41</sup> To prevent suicide by hanging, it might be possible to eliminate hooks from homes that may be used to attach the noose.<sup>42</sup> Suicide by jumping is committed by jumping from balconies, bridge, or jumping into water, train, or a vehicle. Fencing in the places such as high buildings and bridges may prevent suicides by jumping.<sup>43-46</sup> Installing fences along railroad tracks and roads where suicides mostly occur may reduce and restrict access and prevent suicides by jumping.<sup>47</sup> Cameras can be installed at railroad crossings and on platforms to detect people who exhibit dangerous behavior, and alarm buttons can be used to attract the attention of people in the event of emergency.<sup>47</sup> Limiting availability of toxic substances such as pesticides, herbicides<sup>35,38</sup> and reducing the number of prescription drugs<sup>49-52</sup> may lower the number of suicide. Medications can be substituted by injections and prescribed less.<sup>47</sup> The study has some limitations. First, the data was based on the agency data. It is possible that agency data may not be accurate and may contain some errors. Second, the data may not reflect all suicide cases occurred. The data on suicide usually underestimate the true prevalence of suicides in population.<sup>53-54</sup> All of the suicide incidents may not be reported to the police because people may not go to health facilities. Another reason for underestimation of suicide is that families may be reluctant to call injury a suicide attempt because they do not want to be condemned by the people, and they may prefer to conceal suicide attempts to avoid stigmatization. The future studies need to focus on investigating whether suicide methods differ by age, which may provide more detailed information to comprehend the different aspects of suicide methods. In addition, an international comparative study on suicide methods and suicide methods by gender should be conducted. To conclude, there is gender difference in suicide methods in Turkey.

## Acknowledgments

None.

## Conflicts of interest

None.

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