



Gender differences in suicide in Serbia within the period 2006–2010

Razlike u polu kod samoubistava u Srbiji u periodu 2006–2010

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Abstract

Background/Aim. The complex multifactorial etiology of suicide suggests the need to consider gender differences when developing effective strategies for suicide prevention. The aim of this study was to examine the suicide rates and/or trends obtained for population as a whole, including gender differences in cases of committed suicide and to consider factors (age groups, education, employment, marital status, nationality and methods) associated with it in Serbia within the period 2006–2010. **Methods.** Data were obtained from the Statistical Office of the Republic of Serbia. Their classification related to the suicide method was carried out on the basis of ICD-X Code, WHO 1992 (International Statistical Classification of Diseases and Related Health Problems 10th revision, World Health Organization). Statistical analysis was done by using the crude specific suicide rate. **Results.** Within the period 2006–2010 the total number of suicides in Serbia was 6,673, of which 71.9% were males and 28.1% females (male to female suicide ratio 2.56 : 1). Their average rate was 18.15 *per* 100,000 persons, namely, 26.85 *per* 100,000 for males and 9.92 *per* 100,000 for females. Suicide was most often committed by married males and females with high school education, retired, by the Serbs. The suicide rate in Serbia increased parallelly with the age of suicide committers and it was the highest in subjects of both genders aged over 75 years. The most common suicide method in males (62.78%) and in females (58.38%) was hanging and strangling. The second most common method in males was by firearm (18.65%) and in females poisoning (19.26%). **Conclusions.** Suicide prevention Programme should be primarily oriented toward the male population because it is more exposed to stress in the period of social transition, but males are still less ready to ask for doctor's help when having some problems with mental health.

Key words:

suicide; serbia; gender identity; risk factors.

Apstrakt

Uvod/Cilj. Kompleksna multifaktorska etiologija suicida ukazuje na potrebu da se utvrde polne razlike u suicidu kako bi se primenila efikasna strategija za prevenciju suicida. Cilj istraživanja bio je utvrđivanje stope suicida, kako za populaciju u celini, tako i prema polnim razlikama, i utvrđivanje faktora povezanih sa suicidom (godine života, obrazovni nivo, zaposlenost, bračno stanje, nacionalnost, metode suicida) izvršenog u Srbiji u periodu od 2006. do 2010. godine. **Metode.** Podaci za istraživanje dobijeni su od Republičkog zavoda za statistiku Srbije. Klasifikacija podataka koji se odnose na metod suicida utvrđeni su na osnovu ICD-X code, WHO 1992 (*International Statistical Classification of Diseases and Related Health problems, 10th revision, World Health Organization*). Statistička analiza rađena je korišćenjem sirovih podataka stope suicida. **Rezultati.** U periodu od 2006. do 2010. godine u Srbiji je izvršeno ukupno 6 673 suicida, od toga su 71,9% bili muškarci i 28,1% žene. Prosečna stopa suicida iznosila je 18,15 na 100 000 osoba, odnosno 26,85 na 100 000 za muškarce i 9,92 na 100 000 za žene. Muškarci su češće izvršavali suicid od žena (odnos 2,56 : 1). Suicid su najčešće izvršavali oženjeni muškarci i udate žene, sa srednjim obrazovanjem, penzioneri, srpske nacionalnosti. Stopa suicida u Srbiji rasla je sa godinama života suicidanata i najveća je bila kod osoba oba pola starijih od 75 godina. Najčešći metod suicida kod muškaraca (62,78%) i žena (58,38%) bilo je vešanje i davljenje. Kod muškaraca na drugom mestu bilo je vatreno oružje (18,65%), a kod žena trovanje čvrstim i tečnim supstancama (19,26%). **Zaključak.** Program prevencije suicida trebalo bi da bude usmeren prvenstveno na mušku populaciju koja je u periodu tranzicije više izložena stresu, ali je manje spremna da se obrati lekaru kad ima probleme vezane za mentalno zdravlje.

Ključne reči:

samoubistvo; srbija; pol; faktor; faktori rizika.

Introduction

Regardless the undoubtedly important medical, social and psychological aspect of suicide, when considering the complexity and seriousness of this problem, it is also significant from the demographic point of view. According to data from

the World Health Organization (WHO) ¹ suicides are considerably more common among males in all European countries, while attempted suicides are considerably common in females. These differences can be explained by expressive impulsiveness in males who more often choose more effective (more lethal) suicide methods, as well as by the fact that important roles

in the suicidal behavior have also various cultural expectations both from males and females²⁻⁴. Then suicide becomes an option they think about. All this is influenced by their behaviour related to asking for help when being in the suicidal crisis⁵⁻⁷.

In Serbia, an average number of 1,200 persons annually committed suicide within the period 1953–2005. Their number within this period was doubled and there was a significant tendency toward its increase from 725 cases in 1953, to 1,442 suicides in 2005⁸.

If we divide this 50-year period into the three ones, the first one of the Socialist Yugoslavia (1953–1992), the second period of the combat operations on the territory of the former Yugoslavia including also the period of bombing Serbia (1993–1999) and the third period after 2000 and after introducing democratic changes in Serbia, it can be noted that within the first 40-year period there was the gradual increase of the suicide number reaching its maximum of 1,638 cases in 1992⁸.

Within the second period, after 1992, and in the course of several following years there was an obvious more intensive decrease of the suicide number in Serbia even up to 1997 when its number exceeded 1,600 again. This increased suicide number can be explained by economic crisis, inflation in Serbia in 1993/4. After that, the number of suicides was decreased despite the war and bombing in 1999, especially among the elderly. The male suicide number slightly decreased after the war of 1991–1994 just to 1997 when an increased number of suicide in male population was also registered. Thereafter, such a high level kept on in the course of the 90s. Male suicides outnumbered female ones by the ratio 2 : 1⁸.

Later on, in the third observed period after 2000, the tendency of the repeated decrease of the total number of suicides was noted. The male suicide number reached its peak again in 2002. nearly 29/100,000. In 2005 an increased number of suicides was registered from 1,346 (2004) to 1,442 (2005)⁸.

The suicide rate in Serbia showed the tendency to the increase from 1953. The lowest suicide rates were registered at the beginning of 50s of the 20th century, about 12 *per* 100,000 persons, and the highest one in 1992 and 1997 with the rate of 20.9 *per* 100,000. The suicide rate in Serbia de-

creased after 2000⁹. If regions of Serbia are observed within the last half of the century, Vojvodina had 2–3 times higher suicide rate on average than Central Serbia¹⁰.

The aim of this study was to examine the suicide rates and/or trends for the population as a whole, gender differences in cases of committed suicide and to consider factors associated with the suicide in Serbia within the period 2006–2010.

Methods

Data for this study were obtained from the Statistical Office of the Republic of Serbia (Department for Demography).

The total population in Serbia was from 7,411,569 in 2006 to 7,291,436 inhabitants in 2010. All the committed suicides recorded in the foregoing population during the period from 2006 to 2010 were included in the study.

For the statistical analysis a crude specific rate based on the number of suicides within the specific population (female or male) *per* 100,000 persons was used. We calculated the standardized suicide rate according to the direct standardization method.

Gender differences were analyzed by descriptive statistical method. The male/female ratio of suicide is calculated for total number of suicide and for suicide within the total mortality, for annual and age-specific suicide rates, for socio-demographic characteristic (education, employment, marital status, nationality) and for methods of suicide. Classification of data related to the suicide methods were defined on the basis of the ICD-X Code (International Statistical Classification of Diseases and Related Health Problems, 10th revision, WHO)¹¹.

Data processing was carried out in the statistical package program IBM SPSS 20.

Results

A total of 6,673 suicides were committed in Serbia (Central Serbia and Vojvodina) within the period from 2006 to 2010. In that period 4,799 (71.9%) males and 1,874 (28.1%) females committed suicide, namely, males did it on average 2.56 times more often than females (Table 1).

Table 1

Number of suicides in Serbia (Central Serbia and Vojvodina)					
Year of suicide	Region	Total (n)	Males (n)	Females (n)	M/F ratio
2006	Central Serbia	909	645	264	
	Vojvodina	535	377	158	
	Total	1444	1022	422	2.42
2007	Central Serbia	849	596	253	
	Vojvodina	505	373	132	
	Total	1354	969	385	2.51
2008	Central Serbia	826	574	252	
	Vojvodina	464	329	135	
	Total	1290	903	387	2.33
2009	Central Serbia	892	649	243	
	Vojvodina	484	351	133	
	Total	1376	1000	376	2.66
2010	Central Serbia	765	558	207	
	Vojvodina	444	347	97	
	Total	1209	905	304	2.98
Total	Central Serbia	4241	3022	1219	
	Vojvodina	2432	1777	655	
	Total	6673	4799	1874	2.56

M/F = male/female.

The suicide number in the total mortality in Serbia within the period 2006–2010 was 1.29%; 1.84% for males and 0.73% for females. This is 2.52 times higher in males in comparison with that in females (Table 2).

The average suicide rate within this period was 18.15 *per* 100,000 persons, namely, 26.85 *per* 100,000 males and 9.92 *per* 100,000 females (Table 3).

Table 5 shows that within the period 2006–2010 the suicide rate in Serbia was increasing together with the age of the suicide committers. Suicide rate is the highest in subjects of both genders aged over 75 years.

The most common method of suicide both in males (62.78%) and females (58.38%) was hanging and strangling. The second most common method in males was by firearm

Table 2

Suicides within the total mortality

Year of suicide	Total (%)	Males (%)	Females (%)	M/F ratio
2006	1.40	1.95	0.83	2.35
2007	1.31	1.85	0.76	2.43
2008	1.26	1.74	0.76	2.29
2009	1.32	1.90	0.73	2.60
2010	1.17	1.74	0.59	2.95
Mean	1.29	1.84	0.73	2.52

M/F = male/female.

Table 3

Annual suicide rates (*per* 100.000)

Year of suicide	Total	Males	Females	M/F ratio
2006	19.43	28.35	11.08	2.56
2007	18.34	26.99	10.25	2.63
2008	17.55	25.27	10.25	2.46
2009	18.79	28.08	9.99	2.81
2010	16.58	25.51	8.11	3.14
Mean	18.15	26.85	9.92	2.70

M/F = male/female.

Sociodemographic data show that both married males and females with high school education, retired and Serbs most often committed suicide within the mentioned period (Table 4).

(18.65%) and poisoning with solid or liquid substances (19.26%) in females (Table 6).

Table 4

Socio-demographic characteristic of persons who committed suicide

Sociodemographic status	Males (%)	Females (%)	M/F ratio
Marital status			
single	22.19	13.34	1.66
married	48.34	38.26	1.26
widowed	18.64	37.73	0.49
divorced	9.27	9.49	0.97
unknown	1.56	1.18	1.32
Educational level			
no school	3.25	13.39	0.24
uncompleted primary school	15.53	24.18	0.64
primary school	29.29	25.93	1.13
secondary school	43.25	29.40	1.47
high school	3.54	2.62	1.35
university	3.69	2.99	1.23
no data	1.45	1.49	0.97
Employment status			
employed	24.63	9.49	2.59
not employed	21.59	11.85	1.82
retired	50.36	50.22	1.01
dependents	3.42	28.44	0.12
Nationality			
Serbs	80.47	79.99	1.01
Hungarians	8.00	8.97	0.89
Croats	1.44	1.44	1.00
Slovaks	1.42	0.80	1.77
Roma	0.92	1.12	0.82
others	7.75	7.68	1.01
Total	100.00	100.00	

M/F = male/female.

Table 5

Age-specific suicide rates (<i>per</i> 100,000)				
Age range (years)	Total (n = 6,673)	Males (n = 4,799)	Females (n = 1,874)	M/F ratio
< 15	0.04	0.06	0	0.06
15–24	4.11	4.58	2.88	1.59
25–34	8.32	9.12	6.24	1.46
35–44	10.16	11.02	7.95	1.38
45–54	18.70	19.39	16.91	1.15
55–64	18.08	18.36	17.39	1.06
65–74	18.85	17.31	22.78	0.76
> 75	21.61	19.98	25.77	0.77

M/F = male/female.

Table 6

Methods of suicide

Methods of suicide characteristics by groups		Males (%)	Females (%)	M/F ratio
X60-65, X 68-69	self-poisoning by drugs and by exposure to liqued substances	5.71	19.26	0.29
X66-67	exposure to gases	0.23	0.16	1.43
X70	hanging, strangulation and suffocation	62.78	58.38	1.07
X71	drowning and submersion	2.39	7.32	0.32
X72-X75	firearm and explosive material	18.65	3.31	5.60
X76-X77	smoke, fire, flames and hot vapors	0.22	0.16	1.37
X78-X79	sharp and blunt object	2.57	1.39	1.85
X80	jumping from a high place	3.10	5.55	0.56
X81	jumping or lying before moving object	0.33	0.37	0.89
X82	motor vehicle crashing	0.35	0.37	0.94
X83-X84	other specified and unspecified means	3.67	3.73	0.98
Total		100.00	100.00	

M/F = male/female.

Discussion

On the basis of data obtained from the Statistical Office of the Republic of Serbia in the course of the analyzed 5-year period the average suicide rate in Serbia of 18.15 *per* 100,000 within the period 2006–2010 was higher than the average rate in the world, estimated at 11.6 *per* 100,000¹².

Males in Serbia committed suicide 2.56 times more often in comparison with females, which was unchanged in comparison with the previous 5-year period, 2001–2005^{8,9}. The suicide male/female ratio in Serbia is lower in comparison with the average male/female ratio in the Western Europe (4 : 1)¹².

Gender differences in the suicide number are maintained in the same ratio in the Central Serbia and Vojvodina, which is also characteristic for the neighbouring countries regions^{13,14} and Mediterranean part of Croatia (2.36 : 1)¹⁵. But on the territory of Kosovo the ratio of gender differences for the period 2007–2008 was somewhat higher (3 : 1)¹⁶. In Montenegro it was lower (1.7 : 1) in comparison with that in Serbia¹⁷.

The suicide number in the total mortality in Serbia within the observed period was lower than the total mortality in the whole world which, according to the data from WHO, was 1.4%¹. In the male population of Serbia the suicide number in the total mortality from 2006 to 2010 was 2.5 times higher than in females. Taking into consideration that the suicide rate in females was dropping from 2006 to 2010 and in males was dropping up to 2009 and afterwards showing an increase, it can be stated that the increase in the total

suicide number in 2009 was the consequence of the increased suicide number in males in that very year.

The average suicide rate within the analyzed 5-year period was for males 2.46 in 2008, and 3.14 in 2010, namely, it was 2.70 times higher than that in females.

The suicide rate in females from 2006 to 2010 dropped from 11.08 *per* 100,000 inhabitants (2006) to 8.11 *per* 100,000 (2010). So, the highest registered annual level of the suicide rate within the observed 5-year period in females never exceeded its lowest rate in male population.

Sociodemographic data showed that within the period 2006–2010 the suicide was most often committed by married men and women with high school education, retired, Serbs.

With regard to the marital status suicide was most often committed by married men, then unmarried men and widowers. Among females, it was most often committed by married women and widows. Concerning the gender differences, suicide was more often committed by both unmarried and married men then by unmarried women, and widows twice often committed suicide in comparison with widowers. This difference was not noticed in divorced either men or women. Such structure of the died due to suicide in accordance with the marital status is influenced upon composition of population in dependence of the marital status (most of them are married), then upon differences present in the marital structure of both male and female population (there was much more celibates among men and considerably less among widowers) and upon clearly differentiated population structure by age with regard to the marital status (widowers/widows are also the oldest)⁸.

Concerning educational level, the suicide incidence drops together with its higher level. The suicide is more often committed by more educated males (completed primary and high school, faculty) and uneducated females (incomplete primary school or without it), which is in accordance with other studies from the territory of the former Yugoslavia¹³⁻¹⁷.

Suicide was most often committed by retired of both sexes, followed by employed and unemployed males and finally dependents females. Employed males 2.5 times more often committed suicide and twice more often those unemployed in comparison with females of the same professional status, while differences did not exist for retired of both sexes. These differences could be explained by the fact that the males accept changes of socioeconomic conditions with more difficulties, particularly those related to (un)employment, amount of earnings and property. All this has a more important influence upon male than female suicide¹⁸.

When explaining gender differences in suicide rates in the aged, changes that ageing and retirement bring themselves are primarily associated with the change in social and financial status which more affects males because their capabilities to satisfy own existential needs are drastically reduced. For females, changes in the social environment they are to the greater degree sensitive to, are less emphasized so that the risk of suicide in them is less present^{19,20}.

As expected, males and females of the Serbian nationality are those who most often commit suicide, then follow Hungarians, Croats and Slovaks, less frequently those of the Roma (Gypsies) minority. As for the gender, the Serbs, both males and females as well as Croats, also both males and females equally committed suicide, but in other nations some differences with regard to gender were noticed. Namely, the Slovak males considerably more often committed suicide than the Slovak females, but Hungarian and Roma (Gypsy) females more often committed suicide than males of their national minority.

The suicide rate in females increased together with the age. In males, it increased even to the age of 65 and then evidently declined. In males, the highest suicide rate was within the period 55–64 years of age (19.39 *per* 100,000 persons), which was the highest suicide rate with regard to the age for both gender groups. This means that in Serbia age has the higher position when the highest suicide rate is concerned in comparison with European population where its highest rate is registered for males aged 45–59 years¹¹.

Concerning gender, suicide was more often committed by younger males, up to 55 years of age and by elderly fe-

males over 65 years of age, while for the age 55–65 there was no difference between genders.

Regarding the suicide method within the period 2006–2010 both males and females most often committed suicide by hanging, strangling, drowning, then by firearm in males and poisoning either with solid or liquid substances in females. With regard to gender, males 5.6 times more often than females committed suicide by firearm and almost twice more often by sharp and blunt objects and by gas poisoning. Suicide by firearm was a method usually characteristic for the military population^{21,22}, and possession of firearm often illegal in the civil population is a consequence of keeping firearm as a "trophy" after taking part in wars. On the other hand, females unlike males, almost four times more often committed suicide by poisoning either with solid or liquid substances, three times more often by strangling or drowning, and twice more often by jump from height. This result coincides with the existing studies²⁻⁴.

Although in our study we primarily focused on psychosocial and demographic risk factors that could help us to explain gender differences in suicide rates, an important question that follows is whether or not the differences found in this study between male and female suicides are the consequence of gender differences in the prevalence of the possible role of psychiatric and/or behavioural characteristics, which may also mediate gender differences in suicide risk^{23,24}.

Our results showing gender differences provide initial data for researchers in the field of suicidology and should be further investigated.

Conclusion

Our results suggest that the suicide prevention programme should be oriented toward the male population that is, in comparison with the female one in Serbia, exposed to stress in the period of social transition, but less ready to refer to the doctor for help because of problems related to their mental health. This would certainly make easier detection and treatment of psychiatric disorders and would also reduce risk of suicide. For this reason, health education should have the aim to improve motivation in male population particularly to be ready to ask for expert's help and this would reduce suicide risk.

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