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Death Trends and Years of Life Lost Due to Social Harms Such as Suicide, Homicide, and Addiction, Ilam Province, 2009-2019

Zahra Jalilian[1], Fathola Mohamadian[2], Sasan Ahmadi[3], Yousef Veisani[4]*

[1]Psychosocial Injuries Research Center, Ilam University of Medical Sciences, Ilam, Iran
[2]Department of Psychology, Psychosocial Injuries Research Center, Ilam University of Medical Sciences, Ilam, Iran
[3]Legal Medicine Research Center, Legal Medicine Organization, Tehran, Iran
[4]Non-Communicable Diseases Research Center, Ilam University of Medical Sciences, Ilam, Iran

Corresponding author: Yousef Veisani
Address: Non-Communicable Diseases Research Center, Ilam University of Medical Sciences, P.O. Box: 69311-63545, Ilam, Iran. **Tel/Fax:** +98 84 32235707
e-mail: yousefveisani@yahoo.com

▷ ABSTRACT

Objective: This study aimed to investigate the death trend and years of life lost (YLL) caused by social harm in Ilam province.
Methods: This cross-sectional study was conducted in Ilam province from 2009 to 2019. To estimate YLL, all deaths caused by suicide, homicide, and addiction were included in the study. The data were collected from the Forensic Medicine Organization. The analysis was carried out using SPSS software (version 23.0). A *p*-value of <0.05 was considered statistically significant.
Results: Between 2009 and 2019, there were 1712 occurrences of suicide, homicide, and addiction, which resulted in a total of 62,605 years of lost life (53,934 per 100,000 people). The highest frequency was related to the age group of 15-29 years, while the lowest was related to the age group of 0-14 years (*p*<0.001). During the studied period, men were more likely than women to commit suicide, homicide, and addiction in Ilam (*p*>0.439). Between 2009 and 2019, the number of suicides and homicides in Ilam province started a decreasing trend for both sexes, while the number of deaths caused by addiction was increasing.
Conclusion: The results of this study indicated that the age groups of 15-29 years had the highest rate of YLL caused by suicide, homicide, and addiction for both sexes. Furthermore, the findings showed that YLL decreased for suicide and homicide, but increased for addiction.

Keywords: Social harms; Suicide; Addiction; Homicide; YLLs

Introduction

Suicide, homicide, and addiction are among the leading causes of premature death worldwide, imposing social, economic, and cultural issues on society; the burden of which is increasing in all nations, particularly in developing countries [1, 2]. According to the World Health Organization, more than 700,000 suicide deaths occurred in the world in 2019, and the suicide rate was estimated to be

9.0 per 100,000 people per year [3]. Suicide is the third leading cause of death in the age group of 21-30, after diseases and accidents [4]. In addition to suicide, homicide has alarming figures. According to the World Health Organization (2016), about 470,000 homicides occur worldwide annually [5]. Every year, around 200,000 homicides occur among young people aged 10 to 29, which constitutes about 43% of all homicides, and ranks as the fourth leading cause of mortality within this age group [6]. The World Organization's 2013 report revealed that, in addition to suicide and homicide, opioid misuse caused between 70 to 100 thousand deaths annually, accounting for 99 to 253 thousand deaths worldwide in 2010. It was determined that opioid addiction caused 43,000 fatalities in 2010 while drug poisoning caused 180,000 deaths, resulting in the loss of more than two million years of life. Besides, UNODC indicated that drug-related mortality accounts for 0.5 to 1.3 % of all deaths among people aged 15 to 64 [7].

Statistics in Iran also showed that there were 35,279 suicide fatalities between 2006 and 2015. In the 10 years, the total average years of life lost due to premature death was 34.52 per 1000 men, 13.61 per 1000 women, and 23.35 per 1000 people in both sexes. The annual change in the YLL rate was 3.3% [8]. In Iran, the majority of victims were between the ages of 21 and 30 years, followed by those between the ages of 31 and 40 years [9]. Over the past ten years, suicide has gradually increased in Ilam province [10]. In 2014-2018, the suicide rate was 19.5 per 100,000 individuals [11]. According to national research in 2010, Ilam had the highest suicide rate among the 31 provinces of Iran [12]. According to recent national statistics (2006-2016), the rate of homicide and suicide in Ilam was higher than the national rate. The homicide rate in Ilam was 8.1 per 100,000, whereas the national rate was 6.1 per 100,000. In comparison to the national suicide rate of 5.1 per 100,000, Ilam had a suicide rate of 20.7 per 100,000 people [13]. Valid information on the causes of death, as well as a description of the mortality process and its variations, is one of the most fundamental pillars of healthcare planning, management, and evaluation in all countries [14]. To prioritize health concerns, it is necessary to have indicators that clearly demonstrate the real health demands of society [15].

The index of years of life lost due to premature death (YLL), which was introduced by the World Health Organization in the study of the global burden of diseases, can be used to identify and prioritize the causes of premature deaths. This index can be a beneficial analytical tool for prioritizing health concerns and can be utilized in different geographical areas, by using time as the unit of measurement and comparing the years lost due to death with a standard life expectancy curve [16, 17]. Since reducing the burden of accidents is one of the main challenges of public health [18], Ilam province is also considered

a high-risk region; in some years suicide rates have increased up to twice the world average, and this is true even though Ilam province is one of the least populated provinces. This province is perplexing [19]. As a result, one of the essential demands of this province is planning, policy-making, and eliminating the primary causes of premature death. Therefore, in this research, the deaths caused by social harms and their changes, as well as the estimation of the lost years of life due to premature death from 2009 to 2019 in Ilam province were investigated.

Material and Methods

The current research is a 10-year cross-sectional study that included all the deceased in Ilam province from 2009 to 2019 in a total of 4629 cases, and according to the research objectives, 1713 death died due to psychosocial injuries (suicide, homicide, and addiction). In this study, the relevant codes in the International Classification System of Diseases (ICD-10) were considered as the criteria for entering the study. These codes were Z91.5 for suicide, X85-Y09 for homicide, and F10.2, F11.2, F12.2, F13.2, F14.2, F15.2, F16.2, F17.2, F18.2, F19.2 for addiction. The exclusion criteria were deaths caused by other reasons such as accidents or diseases, as well as the deceased who were not residents of Ilam province. The required data was collected using a checklist and in accordance with the objectives of the study. The study variables included age at the time of death, sex, place of residence, level of education, cause of death, and age-specific life expectancy. The Forensic Medicine Center of Ilam province served as the center for data collection. The research checklist was completed using the case numbers. The data were extracted without disclosing the names or other identifying information of the participants.

The entire population of Ilam province from 2009 to 2019 was the target population of this study. The Statistics Center of Iran estimated the total population for 2015, by dividing different provinces of the country, including Ilam, which can be found on the website of the Statistics Center of Iran. To obtain population estimates in each province by age group, according to the change in the sex-age ratio from 2009 to 2019, the same ratio was used, and the population estimated by the Statistics Center in 2015 for each province in age groups was divided into sexes. Since the life expectancy for the age groups considered in this study was not available, the YLL value was calculated using the standard life expectancy table. Besides, the number of deaths caused by social harms such as suicide, homicide, and addiction was calculated by age group and sex using the following formula.

YLL=N*L

In this formula, N stands for the total number of deaths (in a specific age and sex group), and L is the life expectancy in the same age and sex group. The

data were analyzed using SPSS software version 23 (SPSS Inc., Chicago, IL, USA) as well as Microsoft Excel software. The data were evaluated using descriptive statistical tests, such as mean frequency, and percentages.

Results

As indicated in Table 1, the results of the data (suicide, homicide, and addiction) from 2009 to 2019 showed that the total number of deaths caused by social harm in Ilam province was 1712 (1185 men, and 527 women). The number of suicides recorded throughout the studied period was 1106 people, with men (59.2%), single people (57.5%), primary and high school education levels (64.3%), and those living in urban areas (85.3%) having the highest rates of suicide. Moreover, 277 deaths were recorded in Ilam province, which were due to addiction. The highest rate was in men (93.1%), unmarried (70%), primary and high school education (50.2%), and urban residents (95.2%). During the study period, 329 (82.7%) homicide cases were reported, with men (87.2%), single people (66.6%), people with

elementary and high school education levels (59.3%), and urban residents (85.4%) made up the majority of the victims.

The findings indicated that 62,605 years of life were lost due to suicide, addiction, and homicide (53,934 per 100,000 population), with men losing 43049, 9785, and 23,006, respectively. About 7793 per 100,000 populations was more than women ($p>0.439$). According to the statistical analysis of the death trend based on age groups, the age group of 15-44 years had the highest number of years of lost life due to suicide, addiction, and homicide, while the age range of 0-14 years had the lowest number of years of lost life ($p<0.00$). Moreover, the number of years of lost life decreased with increasing age (Table 2).

The time trend of years of life lost is shown in Figure 1. In 2012, 2011, and 2010, YLL was the highest for suicide, addiction, and homicide, respectively. In general, the province experienced its highest levels of YLL due to social harm during the aforementioned years. Although at the end of the survey period, suicide and homicide had significantly decreased; since 2016, the trend for addiction has been rising.

Table 1. Frequency distribution of deaths due to social harms during 2009-2019 in Ilam province (Iran)

Variable	Group	Suicide		Addiction		Homicide	
		Number	percent	Number	percent	Number	percent
Sex	Man	655	59.2	258	93.1	272	82.7
	Female	451	40.8	19	6.9	57	17.3
Marital status	Married	470	42.5	83	30	110	33.4
	Single	636	57.5	194	70	219	66.6
Educational status	Elementary and high school	711	64.3	139	50.2	195	59.3
	Diploma	246	22.2	78	28.2	89	27.1
	Academic degree	144	13	59	21.3	43	12.8
Residence	City	943	85.3	246	95.3	281	85.4
	Village	162	14.6	11	4	46	14
Total		1106	100	277	100	329	100

Table 2. Number of years of life lost due to social harms by age group, in Ilam province of Iran, 2009-2019

| Age category	Suicide		YLL (Total)	YLL per 100,000 thousand population	Addiction		YLL (Total)	YLL per 100,000 thousand population	Homicide		YLL (Total)	YLL per 100,000 thousand population	p-value
	Number of deaths	life expectancy Lost (L)			Number of deaths	life expectancy Lost (L)			Number of deaths	life expectancy Lost (L)			
Men	655	35.2	23006	7793	258	38.08	9785	3314	272	37.8	43049	14583	0.439
Women	451	36.8	16636	5838	19	38.21	726	254	57	38.5	19558	6863	
0-14	12	48.8	731	543	2	62	125	92	8	63.6	503	373	≤0.001
15-29	555	48.1	26739	16943	125	46.4	5856	3710	161	46.9	7561	4790	
30-44	282	35.7	10076	6379	112	35.1	3934	2490	104	35.3	3679	2329	
45-59	126	19.5	2459	3055	29	21.2	615	764	33	20.6	681	846	
60-69	49	7.4	365	1236	3	4.8	15	50	13	7.1	94	318	
70-79	35	-3.2	-114	944	2	-3.5	-7	57	-4	-1.2	5	41	
80+	45	-13.6	-614	7906	2	-12.0	-24	309	-5	-11.8	59	759	
Total	1106	35.9	39642	37006	277	38.09	10511	7472	329	37.96	12452	9456	
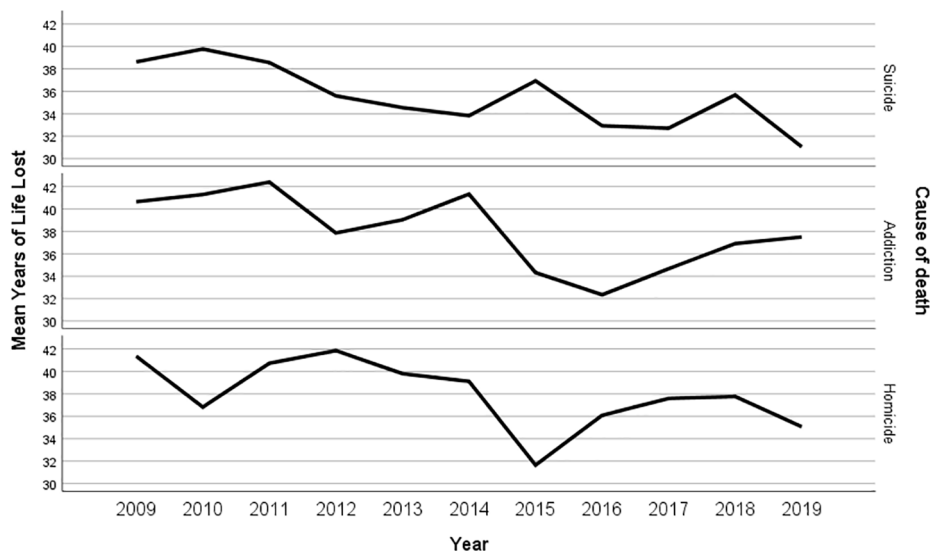
Fig. 1. The trend of years of life lost (YLL) due to social harms in Ilam province during 10-years

Discussion

The purpose of this study was to determine YLL concerning societal harms including suicide, homicide, and addiction. The findings revealed that from 2018 to 2018, men experienced a higher number of deaths from social harm (suicide, homicide, and addiction). The results of this study were in line with those of previous studies by *Pouralajl et al.,* [20], Brazinova *et al.,* [21], and Malras *et al.,* [22]. They reported that sex significantly affects mortality brought on by accidents and social harm (suicide, homicide, and addiction). Other studies indicated that men had the highest rate of death due to accidents and incidents in Africa and low- and middle-income countries in Europe [23]. The relationship between the mentioned variables showed that men are more exposed to social harm than women due to their activities in public environments, and the pressure caused by various social and economic conditions.

Similar to the findings of the study by Khorrami *et al.,* which stated that the largest number of deaths was in the age group of 15-30 years old [24], the findings of the present study indicated that the most years of life lost in this province due to social harm were in the age range of 15-29 years old. Furthermore, the findings of a study by Atai *et al.,* revealed that the age group of 20-24 years had the highest number of lost years of life [25]. According to Akbarpour *et al.,* the highest number of lost years in both sexes was related to the age groups of 20-24 years, 25-29 years, and 15-19 years, respectively [26]. In the study of Distovan *et al.,* YLL was obtained in the age group of 15-29 years [27]. Fond *et al.,* found higher suicide rates among men aged 15 to 29 years in 25 European countries and the United States of America [28]. Another study in Fars province showed that the highest prevalence of homicide was among men whose ages ranged between 20 to 29 years old [29]. According to the World Health Organization report

in 2016, about 83% of homicides were committed by men [30], which was consistent with the findings of the present study. The large number of years lost, due to premature death among people aged 15 to 44, makes it crucial that the impact of accidents on young people, who are influential and productive forces in the nation, be properly planned and managed because they could have a significant negative impact on society. It aimed to reduce the burden caused by psychosocial injuries.

According to the findings of this study, the YLL rate for suicide in both sexes was 39,642 per 100,000 people. The results of a study during the years 2013 to 2018, there were 2148 deaths due to murder in Fars province and (1782 cases (83.0%) were men. The crude death rate for men decreased by 44.0% from 2004 to 2019, but is stable.The trend was observed in women. The total YLL from homicide in these 16 years was 43,230 (1.37 per 1000 people) in men and 8931 (0.29 per 1000 people) in women [31].

Nonetheless, this issue might indicate the disparity in the severity of suicide cases in different parts of Iran. The present research showed that the number of years lost due to homicide in both sexes was 9456 per 100,000 persons. It was also shown that 3630 people were homicide in Iran (4.1 per 100,000) in 2015, which was more common in men (6.8 per 100,000) compared to women. While women over 60 years The elderly had the highest homicide rate (6.5 per 100,000) [32].

Investigating the amount of YLL during the years 2009 to 2019 showed that suicide and homicide decreased in recent years in Ilam province. In contrast, in Ilam province, deaths due to addiction (7472 per hundred thousand population) showed an increasing trend during the period of investigation. The results of a national study showed that drug abuse deaths increased during the 2014-2018 study period. This increasing trend was observed in women and men [33].

This is the first study that explored the amount and effect of the death burden caused by social harms such as suicide, homicide, and addiction in Ilam province. Our country, Iran, like other countries throughout the world, is undergoing a health transformation, with the disease burden shifting from communicable diseases, infant mortality, and malnutrition to non-communicable diseases caused by social harms. Despite the success of health programs in reducing non-communicable diseases and malnutrition, few health programs target non-communicable diseases caused by social harm. Therefore, the healthcare system of the country must concentrate on the most prevalent issues. Currently, the occurrence of homicide, suicide, and addiction in some provinces such as Ilam is higher than the national average. Therefore, it is necessary to implement a health program, professional training, and strategies to prevent the occurrence of violence among the youth of Ilam province, considering that most of these deaths are preventable.

Our study had several strengths. First, the simple early death scale (YLL), which did not require population estimates, investigated preventable early death related to social harms. The second strength was the utilization of the most extensive and precise data on suicide, homicide, and addiction which was collected by the Forensic Medicine Organization of Ilam Province. However, it should be noted that this study had several limitations. One of the limitations was the lack of access to other risk factors for suicide, addiction, and homicide, such as drug and alcohol abuse, income status, employment, and unemployment, as well as the lack of life expectancy data for certain age groups investigated in this study.

Another limitation of this study was the population estimate for the year 2009-2019 in the province, which was not without faults. However, as there was no practical way to count the population in the years under investigation, the population estimate for 2015 was used. In this study, the data were analyzed for the entire province, and the incidence rate was not evaluated by the city to identify focal areas.

Declaration

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