The Relationship between Trauma and Socioeconomic Status in People Over 15 in Kashan, Iran: A Population-Based Study

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A R T I C L E I N F O	A B S T R A C T
  *Corresponding Author: Zahra Sehat **Email:** zahra.sehat@yahoo.com **Tel:** +98 9132636817 	**Background:** Today, global attention has been directed towards differences in the health of different Socioeconomy of society (SES) groups. Trauma is one of the categories where SES determinants are not well understood, especially in developing countries. This study aims to determine the annual incidence of traumabased on SES in people over 15 years old in Kashan. **Methods:** This was a population-based cross-sectional studyusing a household survey .Data were collected through stratified-cluster sampling during 2018-2019 for over 15-year in Kashan. The researchers conducted univariate and multivariate analyses to evaluate trauma during and the past year rgarding SES of individuals using Principal Components Analysis (PCA). **Results:** The incidence of trauma was 70.6 (62. 6-78. 7) in 1000 annually, the risk of trauma in low SES was 1.06 (0.82-1.38), in moderate SES , 0.87 (0.69-1.10), and in high SES, it was 1.13 (0.84-1.52). Among different SES groups, mechanisms of injury were different (P-value = 0.09); also, the annual incidence of trauma in different SES groups was different based on the place of trauma (P-value = 0.02), the number of injuries (P-value = 0.00), treatment (P-value = 0.02), and the time to return to work (P-value = 0.00). **Conclusions:** Annual incidence of trauma in different SES groups was different based on the place of trauma, the number of injuries, treatment, and time to return to work. The relationship between SES status and incidence of trauma is important to provide preventive services. **Keywords:** Incidence, Epidemiology, Population-Based Study, Socioeconomic Status, Traumatic Injuries.

Introductions

Intentional or unintentional traumas have detrimental effects on individual and health budgets (Murray CJ. 2013). Trauma is a leading cause of early death, morbidity and disability, imposing a huge burden on public health in these aspects of lost years of life and social costs. The burden of trauma is not equally distributed across all groups of society and often disproportionately affects some groups, including the young and poor population (Gad MA. 2012). In recent years, global attention has been on the differences in the health of different socioeconomic status (SES) of society (Marmot M. 2007) . Today, there are economic, gender, and racial differences in the field of health, throughout the world (Barreto ML. 2017). Understanding different characteristics of various classes of society to change goal setting is crucial, and health executives need to know to what extent their current or planned policies are sensitive to SES disparities to address them (Gauld R. 2012).

SES does not just encompass income but also education, occupation, and social class. SES can encompass quality of life attributes as well as the opportunities and privileges afforded to people within society. Poverty, specifically, is not the result of a single factor; it is characterized by multiple physical and psychosocial stressors (Lago S. 2018, Saif-Ur-Rahman KM. 2018).

Trauma is one of the categories where SES determinants are not well understood, especially in developing countries. Identifying high-risk SES factors for injury can provide an opportunity to implement preventive interventions in high-risk individuals (Gauld R. 2012, Lago S. 2018).

About 90% of the burden of trauma pertains to low and middle-income countries. Moreover, trauma is the most common cause of death among people in age range of 15–59 (Sehat Z. 2022).

In Europe, people living in middle or low-income countries are 3.6 times more likely to die from trauma than those living in high-income countries. There is a difference regarding all specific causes of injury (Lillini R. 2019, Zoni AC. 2016). In Iran, injuries are of higher importance;

following ischemic heart diseases (9.1%) and low back pain (9%), injuries specialty RTIs (7.3%), are considered the third major contributor to disability-adjusted life years (DALYs). Similar to the global status, in this country, injuries are the first cause of mortality among 15-49 year-old population in both genders (Hashemi E. 2018, Sadeghi-Bazargani H. 2016, Forouzanfar MH. 2014). The burden of trauma is not equally distributed among all groups of societies, and it often disproportionately affects young and poor populations (Gauld R. 2012), resulting in socioeconomic inequalities in health (Sehat Z. 2022). Remarkably, injury has also imposed a lot of direct and indirect economic and social costs on society, which has led health care policymakers to adopt key measures to identify risk factors (Perel P. 2004, Sadeghi-Bazargani H. 2012). Reducing the mortality rate and SES burden, and improving the severely injured patients are the benefits of these policies in different countries (Radjou AN. 2018). Further developments in this area require information gathering, planning, and formulation of new strategies. People's daily living conditions and SES affecting health have a decisive role in traumatic injuries and their consequences. They can be very useful in preventing trauma and its complications (Lehtola S. 2006, Reihani H. 2017). Considering the relationship and different prevalence of trauma in different socio-economic levels and even the type of trauma injuries, this study aims to describe the pattern of annual incidence of non- fatal injuries in people over 15 based on SES in Kashan, Iran.

Methods

This was a population-based cross- sectional study on individuals over 15 residing in Kashan during 2018-2019 using stratified-cluster sampling. The city of Kashan was divided into five regions based on Municipal division mapS, and 25 people from each area were surveyed. All clusters of all areas were identified in the map of Kashan city and were numbered; then, the authors randomly

selected clusters between numbered areas. Twenty-five households were examined in each cluster. The researcher was randomly referred to each of the households, and in each household, randomly one person over 15 was chosen using Kish Grid tables to interview and complete the questionnaire after obtaining informed consent (Khosrozadeh H. 2015). In the absence of randomly selected person or failure to cooperate for the first time, interviews were referred to this person three times to collect information and if she/he did not cooperate, the participant was replaced with the neighboring home. Household surveys were conducted in native language of Kashan (Persian) by trained research assistants from Kashan Medical Science University.

Based on the following formula

$n = \frac{Z^2_{1-\alpha/_2} \times p \times q}{d^2}$ Considering d = 1.5,

Considering the prevalence of trauma at the community status, the minimum number of samples to assess the annual incidence of trauma, was 32.3%, and the required sample size for the study was $n = \frac{963}{32.2\%} = 2981$;then, this number was multiplied by 1.5 in the design effect, and a total of 3875 study samples were determined. (Saadat S. 2011, O'Donnell ML. 2013).

In order to collect the required samples, the authors referred to 4800 households: 4,200 of which agreed to interview for the study (response rate = 87.5%). one hundred and eighty cases were incomplete and unusable, and 140 of the collected data were , which were excluded from the study in the monitoring and evaluation phase. In total, 3880 households were surveyed and collected data were analyzed.

In this study, injury was defined as any intentional or unintentional physical injury following traumatic events. In addition, household was defined as a group of people living together in a dwelling with a separate outer door and a separate kitchen (Barreto, M. L. 2017).

In data gathering phase, from each subject who reported traumatic injury during the past year ,the follow-up questions were asked; they included mechanism, type, number, place, the time of traumatic injuries and hospitalization, treatment, and return to work after trauma. In this study, every participant, mental health and quality of life and disability and Post-traumatic stress disorder (PTSD) after trauma were surveyed.

The instruments used in this study were patient's information questionnaire which consistedof the following parts:

1- **Demographic variables:** age, gender, nationality, ethnicity, marital status, education, occupation, insurance, residence, duration of residence in Kashan, smoking, smoking Hookah, drug addiction, and alcohol.

2- **SES data**: To determine the economic status of individuals, Principal Components Analysis (PCA) method were used. In this method, ten home items (homeownership type, residential area, dishwasher, advanced TV, fridge freezer, microwave oven, car, computer, lipstick and internet access at home) and two cases of social factors (job and education of the head of household) were used to make new variable as asset index. Then, asset index were calculated and divided all the participants in study into three groups with high, middle and low SES (Sehat Z. 2022, Ghobad M. 2018, Garmaroudi GR. 2010, Mansouri A. 2018).

3- **Health status:** This includes the history of a specific illness, diabetes, hypertension, mental disorder, family history of a specific illness, congenital disease, medications used, surgical history, history of treatment and hospitalization, history of disabling diseases, type of health care received, and type of insurance (Sehat Z. 2022).

4- **Trauma data**: the history of trauma during the past year, cause of trauma, type of trauma, time of injury, location of the injury, number of injuries, injury treatment, hospitalization, and return to work and normal life (Mansouri A. 2018).

All the data analysis were performed using SPSS 22 and STATA 12 software. The Kolmogorov–Smirnov test was used for assessing

data normality. Chi-square and Fisher's Exact tests were used to examine differences between the two variables. Logistic regression analysis was used to examine the variables which were significantly associated with trauma outcomes. The significance level was considered less than 0.05, and univariate analysis was used to investigate the relationship between variables and trauma outcomes. Odds ratios (OR) with a 95% confidence interval were reported throughout this study.

1-   Using PCAmethod, the new asset index was calculated on ten homeowners and two social factors and divided into three groups with high, middle, and low social status based on the mean of the variables and the three percentiles of the community. In the PCA method, 12 SES factors in the model of factors having a weighting value above 1, they are used to calculate the asset index and then the sum of SES factors based on the weighting of the first factor. Asset index is created. The higher the weighting value of a variable, the greater would be the value of that variable in society to different SES groups (Sehat Z. 2022, Ghobad M. 2018, Garmaroudi GR. 2010, Mansouri A. 2018, Love JR. 20109).

In this study, factors such as Internet access, microwave oven, residential area, laptop, car, and household education had weighed more than one value, and overall, 71.2% of the variance of variables were covered.

This study was being approved by ethical committee of Kashan Medical Science Uuniversity, Kashan, Iran (Code of Ethics (1397,094)).

Results

The Kolmogorove-Smirnov test revealed that the variables did not have a normal distribution. The association between categorical variables (such as gender and educational status)   , continuous variables (such as age), and the outcome of SES was examined through chi-square and the ManneWhitney U tests, respectively.

In this study, 3880 people were studied. Based on SES factors, the subjects were divided into three groups with low, moderate, and high SES. Most of the subjects had moderate SES. Among all populations of study, incidence of trauma was 70.6 (62.6-78.7) in 1000 annually. A low incidence of trauma was observed in the high SES; in low SES, the incidence of trauma was more, and in the moderate SES, the highest rate of trauma was observed. Table 1 shows the number (%) of participants in the three SES groups and the incidence of trauma per year in each group.

SES	Total [a]	Trauma in the past year [b]	Risk ratio	CI 95% Lower	Upper	P-value [c]
Low	1068 (27.5%)	72 (6.7%)	1.06	0.82	1.38	0.06
Moderate	1996 (51.4%)	150 (7.5%)	0.876	0.69	1.10	0. 2
High	816 (21%)	52 (6.4%)	1			

Table 1. incidence of trauma among the participants over 15 with different SES

a N(Percent) b Chi-square test c logistic regression

In all SES groups, men and women had similar distribution; however, in the group with high SES, women showed a higher percentage of trauma than the other two groups. In all SESgroups, people with injury were mostly in the age group of 30-59. In the moderate SES group, the number of people with injury aged 15 to 29 was higher than the other two groups , and in the low SES, number of traumatized cases over 60 was more than the other groups. In all the three SES groups, the rate of married people was higher than single ones, and statistical tests showed that this relationship was significant (P-value = 0.00).

In all SES groups, the Persian race experienced the highest numbers of trauma, other races were in the low SES group.

In this study, people with low SES showed the highest rate of smoking. Furthermore, the rate of hookah smoking among the low SES group was higher than the other two groups . Drug addiction and alcohol abuse were reported in both groups of low and moderate SES. Table 2, shows the univariate associations of SES characteristics and demographics for traumatic injury.

Table 2. Demographic characteristics of people over 15 with and without traumaregarding SES						
Variables	**History of trauma**	**SES status [a]**			**Total**	**P-value [b]**
		Low	**Moderate**	**High**		
Gender	Male	Injured	55 (25.8%)	125 (58.6%)	33 (15.4%)	213 (100%)	
		Totoal [c]	422 (23.39%)	1031 (57.1%)	351 (19.4%)	1804 (100%)	0.01
	Female	Injured	17 (27.8%)	25 (40.9%)	19 (31.1%)	61 (100%)	
		Total	646 (31.1%)	965 (46.4%)	465 (22.39%)	2076 (100%)	
Age	15-29	Injured	14 (16.6%)	56 (66.6%)	14 (16.6%)	84 (100%)	
		Total	236 (23.2%)	553 (54.3%)	228 (22.4%)	1017 (100%)	
	30-59	Injured	40 (25.9%)	81 (52.6%)	33 (21.4%)	154 (100%)	0.04
		Total	559 (24%)	1206 (51.8%)	562 (24.1%)	2327 (100%)	
	≥ 60	Injured	18 (50 %)	13 (36.1%)	5 (13.8%)	36 (100%)	
		Total	273 (50.9%)	237 (44.2%)	26 (4.8%)	536 (100%)	
marital status	Single	Injured	23 (27.7%)	53 (63.8%)	7 (8.4%)	83 (100%)	
		Total	310 (32.2%)	488 (50.7%)	163 (16.9%)	961 (100%)	0.00
	Married	Injured	49 (25.6%)	97 (50.7%)	45 (23.5%)	191 (100%)	
		Total	758 (25.7%)	1508 (51.3%)	672 (22.8%)	2938 (100%)	
Race	Persian	Injured	53 (22.4%)	137 (58%)	46 (19.4%)	236 (100%)	
		Total	865 (24.6%)	1877 (53.4%)	770 (21.9%)	3512 (100%)	0.00
	Other races	Injured	19 (20.6%)	13 (14.13%)	60 (65.2%)	92 (100%)	
		Total	203 (57.1%)	119(33.5%)	33 (9.2%)	355 (100%)	
Education	< High school graduate [d]	Injured	63 (42.2%)	79 (53%)	7 (4.6%)	149 (100%)	
		Total	988 (35.3%)	1532 (54.8%)	271 (9.7%)	2791 (100%)	0.000
	High school graduate	Injured	9 (7.2%)	71 (56.8%)	45 (36%)	125 (100%)	
		Total	80 (7.34%)	464 (42.6%)	545 (50%)	1089 (100%)	
Employment status	Unemployment [f]	Injured	6 (8.4%)	21 (14%)	1 (1.9%)	28 (100%)	
		Total	58 (17.3%)	221 (66.1%)	55 (16.4%)	334 (100%)	0.000
	Employment	Injured	66 (91.6%)	129 (86%)	51 (98%)	246 (100%)	
		Total	1010 (28.4%)	1775 (50%)	761 (21.4%)	3546 (100%)	
Particular diseases		Injured	17 (26.5%)	37 (57.8%)	10 (15.6%)	64 (100%)	0.003
		Total	318 (37.6%)	438 (51.8%)	89 (10.5%)	845 (100%)	
Insurance		Injured	45 (22%)	114 (55.8%)	45 (22%)	204 (100%)	0.001
		Total	836 (26.3%)	1612 (50.7%)	728 (22.9%)	3176 (100%)	

a N(Percent), b Chi-square test, c Total population in study, d Uneducated people f , educated people

Table 3 demonstrates the results of multivariate analysis examining demographic and socioeconomic variables associated with traumatic injury .

Table 3. The results of multivariate analysis examining demographic and socioeconomic variables associated with traumatic injury

		Unadjusted model (N = 3857)				Fully adjusted model (N = 3365)				Final model (N = 3857)			
		OR	CI (95%) Lower	Upper	P value a	OR	CI (95%) Lower	Upper	P value	OR	CI (95%) Lower	Upper	P-value
Gender	Male	2.12	1.54	2.91	.000	2.13	1.52	2.97	.000	2.35	1.75	3.15	.000
	Female	1											
Nationality	Iranian	0.87	0.71	0.16	. 81	0.38	0.56	0. 15	. 52				
	Others	1											
Marital status	Single	.669	.478	.936	.019	.602	.430	.844	.003	.743	.543	1.018	.064
	Married	1											
Race	Persian	1.170	.977	1.400	.087	1.245	1.036	1.497	.020	1.90	1.47	3.84	.078
	Others	1											
Education	< High school	.737	.539	1.007	.055	.769	.552	1.071	.120				
	> High school	1											
Job	Employment	1.530	.905	2.588	.112	1.020	.509	2.044	.956				
	Unemployment	1											
Age	15–29	1.85	1.71	2.95	.000	1.65	1.55	2.75	.004	1.93	1.85	2.33	.019
	≥ 30	1											
Insurance	Yes	.879	.633	1.220	.440	.811	.580	1.134	.221				
	No	1											
Particular diseases	Yes	1.197	.834	1.718	.329	.915	.652	1.285	.608				
	No	1											
SES	Moderate	1.232	.984	1.543	.069	1.413	1.331	2.51	.000	1.94	.773	2. 48	.055
	Others	1											

a Significance: P-value < 0.05

Among the three groups classified according to SES, different trauma mechanisms were more common in the moderate group. But burn injuries and family disputes were more common in people with high SES.

In all the three groups, the number of people with multiple injuries was more than those with one injury. 1 to 7 days' of hospitalization showed the highest rate of traumaticpatients. In groups with different SES, the number of patients who received non-surgical treatment was more than those who underwent surgical treatment. The highest number of surgeries occurred in the moderate group with the highest number of traumas compared to the other two groups. Chi-square test showed no significant relationship between SES and the type of treatment.The lowest and highest rates of return to work after trauma belonged to thelow SES. People with a low- and moderate SES experienced the highest number of trauma incidents in the street, and as for the highest SES, most of the incidents occurred at home. The chi-square test showed a significant relationship between SES and location of injury. Table 4 shows the different variables of trauma based on SES.

	Table 4. Different variables of trauma based on SES in People Over 15 in Kashan				
Variables		**Low** [a] **N = 72**	**SES Moderate N = 150**	**High N = 52**	**Total N = 274**	***P*-value** [b]

	Variables	Low [a] N = 72	SES Moderate N = 150	High N = 52	Total N = 274	P-value [b]
Mechanisms of trauma	Fall	16 (1.4%)	26 (1.3%)	16 (23.5%)	58 (21.16%)	
	Suicide	2 (0.18%)	1 (0.05%)	0	3 (1.09%)	
	Work injuries	6 (0.56%)	13 (0.65%)	3 (0.48%)	22 (8.02%)	
	Traffic injuries	34 (47.2%)	87 (58%)	19 (36.5%)	140 (51.9%)	0.09
	Burn	1 (0.09%)	4 (0.2%)	6 (0.73%)	11 (4.01%)	
	Conflict and violence	1 (0.09%)	3 (0.15%)	2 (0.21%)	6 (2.48%)	
	Injury during sports	4 (0.37%)	7 (0.35%)	0	11 (4.01%)	
	Others	8 (0.74%)	9 (0.49%)	6 (0.73%)	23 (38.9%)	
Locations of trauma	Street	35 (48.6%)	75 (50%)	17 (32.6%)	127 (46.3%)	
	Road or highway	4 (5.4%)	21 (13.9%)	3 (5.7%)	28 (10.1%)	
	Home	14 (19.4%)	16 (10.6%)	21 (40.3%)	51 (18.6%)	0.02
	Educational / sports	5 (6.9%)	12 (7.9%)	7 (13.4%)	24 (8.6%)	
	Other places	14 (19.4%)	26 (17.3%)	4 (7.6%)	41 (14.9%)	
Number of injuries	One	29 (40.2%)	36 (24%)	20 (38.4%)	85 (31%)	
	Multiple [c]	43 (59.7%)	114 (76%)	32 (61.5%)	189 (69%)	0.00
hospitalization days	1-7	57 (86.3%)	124 (81.5%)	37 (90.2%)	218 (84.1%)	
	8 -15	9 (13.6%)	17 (11.1%)	2 (4.8%)	28 (10.8%)	0.06
	≥ 15	0	11 (7.2%)	2 (4.8%)	13 (5%)	
Surgical treatment		26 (36.1%)	70 (46.6%)	18 (34.6%)	114 (41.6%)	0.02
Time to return to work	1-6 days	9 (14.2%)	15 (10.9%)	8 (16%)	32 (12.8%)	
	7-14 days	5 (7.9%)	8 (5.7%)	7 (14%)	20 (8%)	0.00
	15-29 days	27 (42.8%)	66 (48.1%)	22 (44%)	115 (46%)	
	≥ 30 days	22 (34.8%)	48 (34.9%)	13 (26%)	83 (33.3%)	

a Data are presented as No. (%) b ,Chi-square test, c More than one injury

In different SES groups regarding the low SES, the highest number of traumas occurred in April and February; for the moderate group, they occurred in May and July, and for the high SES, the largest number of traumas occurred in June and January. Chi-square test showed a significant relationship between SES and the time of injury.

Discussion

This population survey suggested that the incidence of injury in Iran was higher than the estimates extracted from hospital-based studies. In contrast, this research assessed the annual incidence rates of non-fatal injuries. This was because all the injuries are not admitted to hospitals, some cases are referred to peripheral clinics, and some even do not seek medical services.

In this project, 3880 people were studied.

Among the three groups of SES, the annual incidence of trauma in the moderate SES group was higher than other groups. In addition, the frequency of injuries was higher in males than the females. But in the high SES group, women with trauma accounted for a higher percentage of people than the other two groups. Many studies in Iran and other countries (Azami-Aghdash S. 2017, Bahadori M. 2015) have mention several factors that may be applicable to most Low- and Middle-income Countries (LMICs). Males are more vulnerable to injury risks due to the special socio-cultural context (more driving, more occupational threats, violence-induced injuries and so on). But, some types of injuries such as those that occur at home may be seen more in females than males due to females' gender roles or the nature of their duties(Azami-Aghdash S. 2017, Bahadori M.

2015).

According to this study, young people were a large number of injury victims, in line with the majority of studies conducted in this area. In the middle SES , 15-29 individuals were more than the other two groups (37.4%). As stated in the results section, the largest number of people with trauma belonged to the moderate SES group, and most people with trauma were in the age group of 15 to 29. In the low-SES group,however, the percentage of people over 60 suffered from more traumatic incidences than the other groups (25%). The cause of higher rate of trauma in this age group could be to the fact that the number of people in this age group was lower.

Age has always been a matter of interest in injury research such that some age groups account for the majority of the injuries. For example, traffic injuries were reported to be the leading cause of death in 15-29 age group (Hashemi E. 2018, Nagata T. 2017). Moreover, the highest increase in the total global rate of years of life with disabilities (YLDs) were between the ages of 40 and 69 (Hashemi E. 2018, Al-Aamri AK. 2017). According to the current study, different trauma mechanisms were more common in the moderate group. In different SES groups, the timing of events were different, and the place of events was different. This pattern was similar to many previous studies (Hashemi E. 2018, Reihani H. 2017, Saadat S. 2011). Traffic accidents were the majority of injuries which was consistent with the results of most of the studies in this field (Sehat Z. 2022, Hashemi E. 2018, Reihani H. 2017). Iran had the world's highest Road Traffic Accident (RTA) death rate (Hashemi E. 2018) . Despite the advances in the prevention of RTA in recent years, they were the primary cause of injuries and the second greatest cause of mortality in Iran (Bakhtiyari M. 2014, Ardalan A. 2014). Based on the results, the rate of motorcycle accidents and their injuries was higher among RTA cases, which was consistent with the numbers obtained from other studies. Also, Falls, poisonings, burns, and road traffic injuries in urban Peruvian children and adolescents (Donroe J. 2007, Yongchaitrakul T. 2012, Hassanzadeh J. 2013) .

The majority of accidents occurred on roads. Since RTAs were the main cause of injuries, roads were the primary accident scene. According to a 2013 WHO report, the safety of Iran's roads has improved slightly in the past few years (Toroyan T. 2013) . But, more initiatives are needed in order to achieve a satisfactory level (Hashemi E. 2018). Poverty is associated with high risk of place of living and residences such as flood-prone and vulnerable home construction that cause prone people to be aggravated to trauma. This increased risk may become more exacerbated in the future. Analyses of the impact of global warming suggest that, worldwide, impoverished populations would be the most impacted by natural hazards associated with climate change by the year 2030 (Santiago PN. 2013, Shahbazi F. 2019) .

limitation of this study was a population-based study with many limitations. While the data were randomly collected, it might not be a complete indicator of the community. However, the data didn't completely match age and sex structure estimates of Kashan. For comparison, the researchers adjusted data based on sex and age, considering that the incidence rate of population-based study was different from a hospital base study.

Households were reluctant to report certain injuries with social implications or feared consequences of reporting events such as self-poisonings or suicidal behaviors and injuries from family violence. For this problem, before starting the interview, objectives of research were described and the subjects were asured that their information would remain confidential to the researcher..

Significant recall bias, would lead to a decreasing disability reported over time, as people would tend to remember smaller injuries that happened recently. Injured people in the nearly time later are reporting many post-traumatic disorders such as disabilities and stress less than far months ago. To overcome this problem,

standard test in this study was used.

Conclusion

In this study, being a 15-29 male employed, and and identified as Persian, were characteristics associated with a higher risk for non-fatal injury. Individuals' SES data should be considered in combination with area-level and country-level data when developing evidence-based public health policies.

One of the goals of a healthy society is eliminating differences in service delivery across different groups of people, such as differences in gender, ethnicity, race, education, income, disability, and geographic location. But, despite the commitment of governments and health systems to improve health indicators, there is still a significant difference in the health status of different social groups. The relationship between SES differences and the consequences of trauma are important for all countries, and understanding the determinants of these differences can help provide preventive services.

Conflicts of interest

The authorsdelcared no conflict of interest.

Ethical Considerations

This study was being approved by ethical committee of Kashan Medical Science Uuniversity, Kashan, Iran.

Code of Ethics

Code of Ethics of this study is 1397, 094.

Authors' contributhions

Z. S, M. S, E. F, and A. O, designed the study;

Z. S and M. S, managed data collection; Z. S, analyzed data, composed the draft, edited the final manuscript, performed the literature search, and helped with the draft; M. S, assisted in data collection, analysis, drafting, and editing the draft. All the four authors read and approved of the final manuscript.

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References

Murray, C. J., & Lopez, A. D. (2013). Measuring the global burden of disease. New England Journal of Medicine, 369(5), 448-457.

Gad, M. A., Saber, A., Farrag, S., Shams, M. E., & Ellabban, G. M. (2012). Incidence, patterns, and factors predicting mortality of abdominal injuries in trauma patients. *North American journal of medical sciences*, *4*(3), 129.

Marmot, M. (2007). Achieving health equity: from root causes to fair outcomes. *The Lancet*, *370*(9593), 1153-1163.

Barreto, M. L. (2017). Desigualdades en salud: una perspectiva global. *Ciência & Saúde Coletiva*, *22*, 2097-2108.

Gauld, R., Blank, R., Burgers, J., Cohen, A. B., Dobrow, M., Ikegami, N., ... & Wendt, C. (2012). The World Health Report 2008–primary healthcare: how wide is the gap between its agenda and implementation in 12 high-income health systems?. Healthcare Policy, 7(3), 38.

Lago, S., Cantarero, D., Rivera, B., Pascual, M., Blázquez-Fernández, C., Casal, B., & Reyes, F. (2018). Socioeconomic status, health inequalities and non-communicable diseases: a systematic review. *Journal of Public Health*, *26*, 1-14.

Saif-Ur-Rahman, K. M., Anwar, I., Hasan, M., Hossain, S., Shafique, S., Haseen, F., ... & Islam, S. (2018). Use of indices to measure socio-economic status (SES) in South-Asian urban health studies: a scoping review. *Systematic reviews*, *7*(1), 1-9.

Abedzadeh-Kalahroudi, M., Razi, E., & Sehat, M. (2018). The relationship between socioeconomic status and trauma outcomes. *Journal of Public Health*, *40*(4), e431-e439. [Persian]

Chakraborty, N. M., Fry, K., Behl, R., & Longfield, K. (2016). Simplified asset indices to measure wealth and equity in health programs: a reliability and validity analysis using survey data from 16 countries. *Global Health: Science and Practice*, *4*(1), 141-154.

Rocha, V., Ribeiro, A. I., Severo, M., Barros, H., & Fraga, S. (2017). Neighbourhood socioeconomic deprivation and health-related quality of life: A multilevel analysis. *PloS one*, *12*(12), e0188736.

Lillini, R., Masanotti, G., Bianconi, F., Gili, A., Stracci, F., La Rosa, F., & Vercelli, M. (2019). Regional indices of socio-economic and health inequalities: a tool for public health programming. Journal of Preventive Medicine and Hygiene, 60(4), E300.

Zoni, A. C., Domínguez-Berjón, M. F., Esteban-Vasallo, M. D., Velázquez–Buendía, L. M., Blaya-Nováková, V., & Regidor, E. (2017). Socioeconomic inequalities in injuries treated in primary care in Madrid, Spain. *Journal of Public Health*, *39*(1), 45-51.

Sethi, D. (2006). *Injuries and violence in Europe: why they matter and what can be done*. WHO Regional Office Europe.

Hashemi, E., Zangi, M., Sadeghi-Bazargani, H., Soares, J., Viitasara, E., & Mohammadi, R. (2018). Population-based epidemiology of non-fatal injuries in Tehran, Iran. *Health promotion perspectives*, *8*(2), 127. [Persian]

Sadeghi-Bazargani, H., Ayubi, E., Azami-Aghdash, S., Abedi, L., Zemestani, A., Amanati, L., ... & Safiri, S. (2016). Epidemiological patterns of road traffic crashes during the last two decades in Iran: a review of the literature from 1996 to 2014. *Archives of trauma research*, *5*(3). [Persian]

Forouzanfar, M. H., Sepanlou, S. G., Shahraz, S., Dicker, D., Naghavi, P., Pourmalek, F., ... & Naghavi, M. (2014). Evaluating causes of death and morbidity in Iran, global burden of diseases, injuries, and risk factors study 2010. *Archives of Iranian medicine*, *17*(5), 0-0. [Persian]

Perel, P., McGuire, M., Eapen, K., & Ferraro, A. (2004). Research on preventing road traffic injuries in developing countries is needed. *BMJ*, *328*(7444), 895.

Sadeghi-Bazargani, H., & Mohammadi, R. (2012). Epidemiology of burns in Iran during the last decade (2000–2010): review of literature and methodological considerations. *Burns*, *38*(3), 319-329. [Persian]

Radjou, A. N., & Kumar, S. M. (2018). Epidemiological and clinical profile of fatality in vulnerable road users at a high volume trauma center. *Journal of Emergencies, Trauma, and Shock*, *11*(4), 282.

Lehtola, S., Koistinen, P., & Luukinen, H. (2006). Falls and injurious falls late in home-dwelling life. *Archives of gerontology and geriatrics*, *42*(2), 217-224.

Reihani, H., Pirazghandi, H., Bolvardi, E., Ebrahimi, M., Pishbin, E., Ahmadi, K., ... & Rahimi-Movaghar, V. (2017). Assessment of mechanism, type and severity of injury in multiple trauma patients: A cross sectional study of a trauma center in Iran. *Chinese journal of traumatology*, *20*(2), 75-80. [Persian]

Khosrozadeh, H., Alavi, N. M., Gilasi, H., & Izadi, M. (2017). Oral health-related quality of life in older people in Kashan/Iran 2015. *Nursing and Midwifery Studies*, *6*(4), 182-188. [Persian]

Saadat, S., Mafi, M., & Sharif-Alhoseini, M. (2011). Population based estimates of non-fatal injuries in the capital of Iran. *BMC public health*, *11*, 1-9. [Persian]

Meaghan, L. O., Varker, T., Holmes, A. C., Ellen, S., Wade, D., Creamer, M., ... & Forbes, D. (2013). Disability after injury: the cumulative burden of physical and mental health. *The Journal of clinical psychiatry*, *74*(2), 4524.

Ghobad, M., Farideh, M., Mohammad, H., Mohammad, A., Amjad, MB., et al. (2018) Socioeconomic Inequalities in Different Types of

Disabilities in Iran. Iranian Journal of Public Health, 47(3). [Persian]

Garmaroudi, G. R., & Moradi, A. (2010). Socio-economic status in Iran: a study of measurement index. *Payesh (Health Monitor)*, *9*(2), 137-144. [Persian]

Mansouri, A., Emamian, M. H., Zeraati, H., Hashemi, H., & Fotouhi, A. (2018). Economic inequality in presenting vision in Shahroud, Iran: two decomposition methods. International journal of health policy and management, 7(1), 59. [Persian]

Love, J. R., & Fox, R. A. (2019). Home-based parent child therapy for young traumatized children living in poverty: A randomized controlled trial. Journal of Child & Adolescent Trauma, 12, 73-83.

Azami-Aghdash, S., Sadeghi-Bazargani, H., Shabaninejad, H., & Gorji, H. A. (2017). Injury epidemiology in Iran: a systematic review. Journal of injury and violence research, 9(1), 27. [Persian]

Bahadori, M., Sanaeinasab, H., Ghanei, M., Tavana, A. M., Ravangard, R., et al. (2015). The social determinants of health (SDH) in Iran: a systematic review article. Iranian journal of public health, 44(6), 728. [Persian]

Nagata, T., Abe, T., Takamori, A., Kimura, Y., & Hagihara, A. (2017). Factors associated with the occurrence of injuries requiring hospital transfer among older and working-age pedestrians in Kurume, Japan. BMC public health, 17(1), 1-9.

Al-Aamri, A. K., Padmadas, S. S., Zhang, L. C., & Al-Maniri, A. A. (2017). Disentangling age–gender interactions associated with risks of fatal and non-fatal road traffic injuries in the Sultanate of Oman. BMJ global health, 2(3), e000394.

Bakhtiyari, M., Mehmandar, M. R., Mirbagheri, B., Hariri, G. R., Delpisheh, A. (2014). An epidemiological survey on road traffic crashes in

Iran: application of the two logistic regression models. International journal of injury control and safety promotion, 21(2), 103-109. [Persian]

Ardalan, A., Sepehrvand, N., Pourmalek, F., Masoumi, G., Sarvar, M. (2014). Deadly rural road traffic injury: a rising public health concern in IR Iran. International journal of preventive medicine, 5(2), 241. [Persian]

Donroe, J., Gilman, R. H., Brugge, D., Mwamburi, M., & Moore, D. A. J. (2009). Falls, poisonings, burns, and road traffic injuries in urban Peruvian children and adolescents: a community based study. Injury prevention, 15(6), 390-396.

Yongchaitrakul, T., Juntakarn, C., & Prasartritha, T. (2012). Socioeconomic inequality and road traffic accidents in Thailand: comparing cases treated in government hospitals inside and outside of Bangkok. Southeast Asian Journal of Tropical Medicineand Public Health, 43(3), 785.

Hassanzadeh, J., Mohammadbeigi, A., Eshrati, B., Rezaianzadeh, A., & Rajaeefard, A. (2013). Determinants of inequity in health care services utilization in Markazi Province of Iran. Iranian Red Crescent Medical Journal, 15(5), 363. [Persian]

Toroyan, T., Peden, M. M., & Iaych, K. (2013). WHO launches second global status report on road safety. Inj Prev, 19(2): 150.

Santiago, P. N., Ursano, R. J., Gray, C. L., Pynoos, R. S., Spiegel, D. (2013). A systematic review of PTSD prevalence and trajectories in DSM-5 defined trauma exposed populations: intentional and non-intentional traumatic events. PloS one, 8(4), e59236.

Shahbazi, F., Nazari, S. S. H., Soori, H., & Khodakarim, S. (2019). Socioeconomic inequality in mortality from road traffic accident in Iran. Journal of research in health sciences, 19(1), e00437. [Persian]