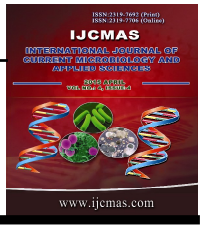
International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 4 Number 4 (2015) pp. 240-247**
http://www.ijcmas.com



Original Research Article

The association between socioeconomic status and injury in patients referring to expert accident hospital, Shiraz, Iran

Mahnaz Yadollahi[1], FroodAzadi[1]*, HalehGhaem[1], Ali Ghaem1, Shahram Paydar[1], Shahram Bolandparvaz[1], Hamidreza Abbasi[1] and Mohammad Farahmand[2]

[1]Trauma Research Center, Shiraz University of Medical Science, Shiraz, Iran
[2]Department of Radiology, Shiraz University of Medical Science, Shiraz, Iran
**Corresponding author*

A B S T R A C T

Occurrence of injury and its related mortality are associated with socioeconomic factors, such as educatio n and social status. The present study aimed to determine the association between Socioeconomic Status (SES) and occurrence of various injury types and mortality rate among Iranian people. This cross-sectional study was conducted on 446 patients aged above 16 years in Shahid Rajaee hospital, Shiraz, Iran. The participants completed a structured questionnaire including demographic information, such as age, sex, and marital status, indicators of SES, such as education and occupation, and injury information, such as type of injury. Chi-square test and factor analysis was used to analysis the data. The results showed that injury and mortality rates were significantly higher among the males (n=306) compared to the females (n=140) (P<0.001) and the maximum rate of mortality (72%) was related to the patients within the age range of 24-40 years (P<0.001).According to the results, the rates of injury and mortality were higher among the patients with diploma and illiterate ones, respectively. Also, the rate of injures and mortality was significantly higher among the patients with low monthly incomes. Traffic accidents were the most common cause of injuries in both genders. Besides, a significant difference was observed between the patients with different SES, including gender, level of education, and occupation, regarding the causes of injuries, such as traffic accidents and falling down. This study showed that the indicator of SES influenced injury related mortality and morbidity in adult populations. Interventions, such as legislative and regulatory controls or a combination of different methods implemented at the community level especially for populations with low SES, should be used to increase individuals' SES and decrease injury and mortality rate.

Keywords

Injury, Mortality, Socioeconomic status

Introduction

Indicators of Socioeconomic Status (SES) are one of the most common metrics used in health researches and are among the influential indicators affecting individuals' position in the community (Galobardes et al., 2006). SES

affects individuals' health outcomes even in rich societies (Pickett and Pearl, 2001). In several studies,SES was found to have animpacton diseases, such as asthma (Marder et al., 1992) and cardiovascular disease (Winkleby et al., 1992). Various indicators of SES, including occupation (Kotler and Wingard, 1989), education (Lahelma and Valkonen, 1990), and household income (Pappas et al., 1993), have also been shown to affect health outcomes. Among the indicators of SES that affect individuals' health outcomes, wealth and family income, occupation, and level of education are the most influential ones (Duncan et al., 2002).

In addition, the indicators of SES have a critical effect on social behaviors and their associated mortality (Lantz et al., 1998; Van Hoving et al., 2013). Yet, the influence any particular indicator of SES on health can differ across different population subgroups (Elo and Preston, 1996; House et al., 1994).

A study conducted in Norway revealed an inverse relationship between the injured individuals' economic status and mortality rate in traffic accidents (Kristensen et al., 2012). Since SES plays an impressive role in social behaviors, especially injuries and accidents (Williams et al., 1997),verifying differences between socioeconomic groups regarding health status permits both a better knowing of the causes of injuries and a better targeted method to solutions (Hyder and Peden, 2003).

Nonetheless, onlya limited number of researches have taken this issue into account. Hence, the present study aims to evaluate the indicators of SES as well as their relationships with mortality rate and types of injures among the injured patients referring to ShahidRajaee hospital, Shiraz, Iran.

Methods and participants

This cross-sectional study was conducted in Shahid Rajaee hospital affiliated to Shiraz University of Medical Sciences, Shiraz, Iran from May to October 2014. The study group included 446patients aged above 16 years who had referred to Shahid Rajaee hospital. The participants were selected through systematic random sampling. The patients who were below 16 years of age or were not willing to cooperate were excluded from the study. The study was approved by the Research Ethics Committee of the University.

All the participants completed a structured questionnaire requesting demographic information, including age, sex, and marital status, indicators of SES, including education, occupation, monthly income, type of housing (personal, rental, organizational), and having a vehicle, and injury information, including indicate type of injury and location of the accident through face-to-face interview by trained interviewer.

In this study, individuals' occupations were divided into five categories, including unemployed, worker, low-grade-employee, high-grade-employee, and employer and professional expert. Levels of education were also divided into illiterate, high school diploma, and academic degrees, such as bachelor, master, and PhD.

Statistical analysis

The Chi-square test and factor analysis were used to analyze the data. All statistical evaluations were made assuming a two-sided test based on a 5% level of

significance usingthe SPSS statistical software (v. 19).

Results and Discussion

This study was conducted on 446 patients, including 306(68.5%) males and 140 (31.5%) females. The patients' age ranged from 16 to 65 years (Mean±S.D=39.5±23.5 years). The results showed that injury and mortality rates were significantly higher among the males compared to the females (P<0.001). The results also demonstrated that the majority of the patients (63%) were within the age range of 24-40 years and the maximum rate of mortality (72%) was related to these patients (P<0.001). The results revealed no significant differences in injury and mortality ratesamong the patients with different indicators of SES, including place of living (town or village), vehicle ownership, family size, type of housing (personal, rental, organizational), and occupation (P>0.05). On the other hand, most of the patients had diplomas (63.5%) and the mortality rate was higher among the illiterate patients (47%). Also, injury and mortality rates were significantly higher among the patients with low monthly incomes, including less than 100 dollars, 100-300 dollars, and 300-500 dollars (P<0.001)(Table 1).

The results of the present study showed significant differences among the patients with different indicators of SES, including gender, level of education, and occupation, in terms of causes of injuries, such as traffic accidents and falling down (Table 2).Traffic accident was the mostcommon cause of injuries in both genders (65.5%). Yet, the rate of traffic accidents was significantly higher among the patients with academic degrees (77.3%) in comparison to illiterate patients and those with diplomas (65.5%). On the other hand, falling down as the second most prevalent cause of injuries was significantly higher among the illiterate patients (34%) in comparison to those with diplomas and academic degrees (P<0.05). However, nosignificant differences were observed among the patients with different places of living (town or village), vehicle ownership statuses, and familysizes regarding the causes of injuries (P<0.05). Yet, the frequency of traffic accidents was significantly lower among the workers compared to other occupations (P<0.05). On the other hand, falling down as the second prevalent cause of injuries was significantly more prevalent among the workers compared to other occupations (P<0.05). Finally, no significant difference was found among the patients with different monthly incomes with respect to the causes of injuries. Nevertheless, traffic accidents were the main causes of injuries (88%)among the patients with high monthly incomes, including 500-900 dollars and more than 900 dollars.

High SES is a protective factor at any age (principally up to the age of 24) againstinjuries and other health outcomes (Cubbin and Smith, 2002; Krug et al., 2000). In the present study, we evaluated the association between the indicators of SES and injury and mortality rates and types of injuries in a heterogeneous, sociodemographically diverse group of patients. SES was measured through education level, income status, place of living, occupation, vehicle ownership, type of housing, and family size.

Gender-specific SES is one of the complex indications of societal distribution of health determinants and outcomes. Several reports have revealed that high-risk behaviors partly explain the high rate and distinct socioeconomic pattern related tomale traffic

accident deaths(Kristensen et al., 2012). The results of the present study also showedthat injury and mortality rateswere significantly higher among themale patients compared to the females.

Several studies have presented strong inverse associations amongeducation level, all-cause mortality, and life expectancy(Feldman et al., 1989; Jacobsen and Thelle, 1988; Snowdon et al.,1989). Pinsky et al. (1987)demonstrated that only education level and age were related in both sexes to "survival with good function". According to the current study results, most of the patients had diplomas and the mortality rate was significantly higher among the illiterate patients. In other words, our findings further support the idea of inverse associations between education level and injury and mortality rates. Up to now, numerous explanations have been proposed for the positive impact of education on health. Some have stated that education may simply help as a marker for intelligence (Howard and Anderson, 1978). It has been argued that higher education levels might increase health by conferring economic benefits. Moreover, achievement of knowledge about health can improve the relationship between education and health, given that provision of information alone seems to be a weak motivation to human behavior modification (Williams, 1990). Finally, education may protect against diseases by influencing life-style behaviors, problem-solving abilities, and values (Liberatoset al.,1988).

The findings of the current study were consistent with those obtained by Duncan et al. (2002) who found strong associations between the economic indicators, including wealth, family income, and SES, and mortality gradients. They also found some weaker associations between SES and education and occupation. Our results indicated a significantly higher injury and mortality ratesamong the patients with low monthly incomes, including less than 100 dollars, 100-300 dollars, and 300-500 dollars. The findings related to income and educational status appear to be in agreement with the existing literature (Duncan et al., 2002, Feldman et al., 1989; Jacobsen and Thelle, 1988; Snowdon et al.,1989; Pinsky et al., 1987;Cubbin et al., 2000; Singh and Yu, 1996). These results proved that educational attainment and income were significant predictors of health outcomes.In the study by Gillen et al. (2007), occupation was a key risk factor for work-related musculoskeletal disorders in comparison to other broad socioeconomic factors, such as education level and income status. Indeed, increased relative risk ratios for different occupations were found in other studies (Cubbinet al., 2000;Jenkins, 1993; Loomis, 1991) and recommend occupational risks for fatalities. Our study results revealed no significant differencesamong the patients with different occupationsregarding injury and mortality rates. This can possibly be explained by the fact that individualsoccupied in high-risk occupationsand manufacturing have diverse risk profiles from the rest of the population(Loomis, 1991). However, we were not able to determine and categorized the patients' occupational profiles, which was one of the limitations of our study.

In the present study, traffic accidents were the most common cause of injuries in both genders (65.5%). Another report from an Iranian population alsoshowed traffic accidents as the most frequent cause of trauma (58.4%)(Bijani et al. 2013). Low SES at local or individual levels has been shown to increase the risk of fatal and non-fatal traffic injuries in various studies(Laflamme et al., 2009).

Table.1 Descriptive statistics of the patients' injury and mortality rates based on the indicator of SES

		Total n(%)	P-value	Mortality n(%)	P-value
Gender	Male	306	<0.001	57	0.02
	Female	140		11	
Age (year)	16-24	80	<0.001	6	<0.001
	24-40	248		49	
	40-60	52		8	
	Above 60	12		5	
Type of housing	Personal	202	0.8	33	0.7
	Rental	209		32	
	Organizational	5		1	
Marital status	Single	164	0.04	28	0.3
	Married	263		34	
	Divorced	4		0	
	Widowed	15		2	
Level of education	Illiterate	117	<0.001	32	<0.001
	Diploma	281		29	
	Academic degree	44		7	
Place of living	City	350	0.03	54	0.61
	Village	79		14	
Monthly income (dollar)	< 100	73	0.00	22	0.01
	100 to 300	224		27	
	300 to 500	104		14	
	500 to 900	9		1	
	>900	9		2	
Vehicle ownership	No	292	0.14	52	0.29
	Yes	116		15	
Family size	1 -2	69	0.11	6	0.09
	3 -4	100		15	
	≥5	248		47	
Occupation	Unemployed	80	0.3	6	0.3
	Worker	86		32	
	Low-grade employee	162		17	
	High-grade employee	52		8	
	Employer and expert	5		1	

Table.2 Descriptive statistics of the indicator of SES and their Relationship with the types of injuries

		Traffic accidents	Falling down	Falling objects	Hit resulting from invasion	Guns	P-value
Gender	Male n(%)	202 (66)	58 (19)	11 (4)	27 (9)	6 (2)	0.02
	Female n(%)	89 (63)	42 (31)	3 (2)	6 (4)	0	
Marital status	Single n(%)	112 (68)	33(20.5)	4 (2.5)	14 (8.5)	1 (0.5)	0.8
	Married n(%)	169 (64)	60 (23)	10(16)	19 (7)	5 (2)	
	Divorced n(%)	3 (75)	1 (25)	0	0	0	
	Widowed n(%)	9 (60)	6 (40)	0	0	0	
Level of education	Illiterate n(%)	69 (59)	41 (34)	2 (2)	4 (4)	1 (1)	<0.001
	Diploma n(%)	188 (67)	55 (20)	8 (3)	25 (9)	3 (1)	
	Academic degree n(%)	34 (77)	3 (7)	4 (9)	2 (4.5)	1 (2.5)	
Place of living	City n(%)	227 (66)	81 (22)	13 (4)	25 (7)	3 (1)	0.12
	Village n(%)	52 (65)	17 (21)	0	7 (10)	3 (4)	
Family size	1 -2 n(%)	49 (71)	11 (16)	4 (6)	3 (4)	2 (3)	0.06
	3 -4 n(%)	65 (65)	19 (19)	6 (6)	9 (9)	1 (1)	
	≥5 n(%)	162 (66)	64 (25)	2 (1)	17 (7)	2 (1)	
Vehicle ownership	No n(%)	185 (64)	68 (24)	12 (4)	22 (7)	4 (1)	0.16
	Yes n(%)	87 (75)	19 (16)	1 (1)	8 (7)	1 (1)	
Occupation	Unemployed n(%)	56 (70)	17 (21)	2 (2.5)	5 (6.5)	0	<0.001
	Worker n(%)	47 (55)	24 (28)	5 (6)	8 (9)	2 (2)	
	Low grade employee n(%)	119 (73)	32 (20)	0	10 (6)	1 (1)	
	High grade employee and employer n(%)	34 (65)	10 (20)	3 (5.5)	3 (5.5)	2 (4)	
Monthly income (dollar)	<100 n(%)	46 (64)	21 (29)	1 (1)	4 (5)	1 (1)	0.6
	100 to 300 n(%)	8 (88)	1 (12)	0 (0)	0 (0)	0 (0)	
	300 to 500 n(%)	143 (64)	49 (22)	11 (5)	18 (8)	2 (1)	
	500 to 900 n(%)	74 (71)	17 (16)	2 (2)	8 (8)	3 (3)	
	>900 n(%)	8 (88)	1 (12)	0 (0)	0 (0)	0 (0)	

Considering the high frequency of traffic accidents as one of the major causes of injury, elementary changes should be done in traffic and transportation behaviors, especially in Iranian populations.

It appears that investigation of the association between SES and the rate, type, and severity of injuries may be modified by specific study conditions and specific characteristics of each country and population. Interventions, such as legislative and regulatory controls or a combination of legislation, environmental modification, and educational efforts implemented at the community level, should be used to increase SES and decrease injury and mortality rate (Faelker et al., 2000).

Acknowledgment

This study was extracted from the thesis written by Mr. Frood Azadi which was approved by Shiraz University of Medical Sciences.

References

Bijani, M., Nikrooz, L., Naghizadeh, M.M., Tavakkol, Z. 2013. The Incidence of Chest Trauma in Patients Refer to Vali-Asr Hospital of Fasa:(Epidemiology of chest trauma). J Fasa University Med. Sci., 3(3):285-289.

Cubbin, C., LeClere, F.B., Smith, G.S. 2000. Socioeconomic status and the occurrence of fatal and nonfatal injury in the United States. Am. J. Public Health., 90(1):70.

Cubbin, C., Smith, G.S. 2002. Socioeconomic inequalities in injury: critical issues in design and analysis. Ann. Rev. Public Health, 23(1):349-375.

Duncan, G.J., Daly, M.C., McDonough, P., Williams, D.R. 2002. Optimal indicators of socioeconomic status for health research. Am. J. Public Health., 92(7):1151-1157.

Elo, I.T., Preston, S.H. 1996. Educational differentials in mortality: United States, 1979–1985. Social Sci. Med., 42(1):47-57.

Faelker, T., Pickett, W., Brison, R.J. 2000. Socioeconomic differences in childhood injury: a population based epidemiologic study in Ontario, Canada. Inj. Prevent., 6(3):203-208.

Feldman, J.J., Makuc, D.M., Kleinman, J.C., Cornoni-Huntley, J. 1989. National trends in educational differentials in mortality. Am. J. Epidemiol., 129(5):919-33.

Galobardes, B., Shaw, M., Lawlor, D.A., Lynch, J.W., Smith, G.D.2006. Indicators of socioeconomic position (part 1). J. epidemiol. community health,60(1):7-12.

Gillen, M., Yen, I.H., Trupin, L., Swig, L., Rugulies, R., Mullen, K., et al. 2007. The association of socioeconomic status and psychosocial and physical workplace factors with musculoskeletal injury in hospital workers. Am J industrial Med., 50(4):245-260.

House, J.S., Lepkowski, J.M., Kinney, A.M., Mero, R.P., Kessler, R.C., Herzog, A.R. 1994. The social stratification of aging and health. J. Health Social Behav., 35:213-234.

Howard, M.P., Anderson, R.J. 1978. Early identification of potential school dropouts: A literature review. J Policy Pract. Program.,57(4): 221-231.

Hyder, A.A., Peden, M. 2003. Inequality and road-traffic injuries: call for action. Lancet., 362(9401):2034-2035.

Jacobsen, B.K., Thelle, D.S. 1988. Risk factors for coronary heart disease and level of education the tromsø heart study. Am. J. Epidemiol., 127(5):923-932.

Jenkins, E.L. 1993. Fatal injuries to workers in the United States, 1980-1989: a decade of surveillance: national profile: US Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention,

National Institute for Occupational Safety and Health.

Kotler, P., Wingard, D.L. 1989. The effect of occupational, marital and parental roles on mortality: the Alameda County Study. Am. J. Public Health,79(5):607-612.

Kristensen, P., Kristiansen, T., Rehn, M., Gravseth, H.M., Bjerkedal, T. 2012. Social inequalities in road traffic deaths at age 16–20 years among all 611 654 Norwegians born between 1967 and 1976: a multilevel analysis. Inj. prevent.,18(1):3-9.

Krug, E.G., Sharma, G.K., Lozano, R. 2000. The global burden of injuries. Am. J. Public Health., 90(4):523.

Laflamme, L., Burrows, S., Hasselberg, M. 2009. Socioeconomic differences in injury risks: a review of findings and a discussion of potential countermeasures. World Health Organization.

Lahelma, E., Valkonen, T. 1990. Health and social inequities in Finland and elsewhere. Social Sci. Med., 31(3):257-265.

Lantz, P.M., House, J.S., Lepkowski, J.M., Williams, D.R., Mero, R.P., Chen, J. 1998. Socioeconomic factors, health behaviors, and mortality: results from a nationally representative prospective study of US adults. Jama., 279(21):1703-1708.

Liberatos, P., Link, B.G., Kelsey, J.L. 1988. The measurement of social class in epidemiology. Epidemiol. Rev., 10(1):87-121.

Loomis, D.P. 1991. Occupation, industry, and fatal motor vehicle crashes in 20 states, 1986-1987. Am. J. Public Health., 81(6):733-735.

Marder, D., Targonski, P., Orris, P., Persky, V., Addington, W. 1992. Effect of racial and socioeconomic factors on asthma mortality in Chicago. CHESTJ., 101(6):426-429.

Pappas, G., Queen, S., Hadden, W., Fisher, G. 1993. The increasing disparity in mortality between socioeconomic groups in the United States, 1960 and 1986. New En. J. Med., 329(2):103-9.

Pickett, K.E., Pearl, M. 2001. Multilevel analyses of neighbourhood socioeconomic context and health outcomes: a critical review. J. epidemiol. community health,55(2):111-122.

Pinsky, J.L., Leaverton, P.E., Stokes, J. 1987. Predictors of good function: the Framingham Study. J Chronic Dis., 40:159-167.

Singh, G.K., Yu, S.M. 1996. US childhood mortality, 1950 through 1993: Trends and socioeconomic diffferentials. Am. J. Public Health., 86(4):505-512.

Snowdon, D.A., Ostwald, S.K., Kane, R.L. 1989. Education, survival, and independence in elderly Catholic sisters, 1936-1988. Am. J. Epidemiol., 130(5):999-1012.

Van Hoving, D.J., Sinclair, M., Wallis, L.A. 2013. Patterns of seatbelt use in different socioeconomic communities in the Cape Town Metropole, South Africa. South African Med. J. = Suid-Afrikaanse tydskrif vir geneeskunde, 103(9):628-631.

Williams, D.R. 1990. Socioeconomic differentials in health: A review and redirection. Social. Psychol. 53(2):81-99.

Williams, J., Currie, C., Wright, P., Elton, R., Beattie, T. 1997. Socioeconomic status and adolescent injuries. Social Sci. Med., 44(12):1881-91.

Winkleby, M.A., Jatulis, D.E., Frank, E., Fortmann, S.P. 1992. Socioeconomic status and health: how education, income, and occupation contribute to risk factors for cardiovascular disease. Am. J. Public health., 82(6):816-820.