

## Original Article

# Severe Home Injuries and Disabilities in 2<sup>nd</sup> İnönü District, İzmir

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## Abstract

**Purpose:** The aim of this study was to determine severe home injuries resulting from a disability in Turkey.

**Methods:** This cross-sectional study was conducted in 2. İnönü district in İzmir. There were 1,765 households, and a sample of 326 households was randomly selected. Data on 1,332 people were collected via face-to-face interviews. The chi-square test, Fisher's exact test, and logistic regression analysis were used.

**Results:** There were a total of 145 home injuries (10.9%). There were 22 severe home injuries (1.7%) such as falling from high levels, electrical shock, fire burn, and poisoning. Most severe home injuries were due to falling from high (45%) and took place in slum settlements (77%). Nine of these injuries resulted in a disability (7 per 1000). When we evaluated all home injuries, children under the age of five years old (28.8%), women (14.5%), and those with moderate-good income (12.8%) had significantly more injuries. However when special attention was paid to severe home injuries and disabilities, only children under the age of five years old had more severe injuries (5.4%) and disabilities (2.7%). The risk of severe home injuries is four times higher (Odds Ratio-OR: 4.27; 95% CI: 1.6-11.3) and that of disabilities is nearly six times higher (OR: 5.57; 95% CI: 1.3-22.9) in children under the age of five.

**Conclusion:** Children under the age of five years old had severe home injuries and disabilities. Routine home visits and training of mothers who have children under the age of five by primary health care workers should be organized to prevent severe home injuries.

**Keywords:** Injury, accident, fall, disability, slum settlement, children

## INTRODUCTION

Home injuries are important public health problems in the developed and developing world (1-6). In surveying the literature for home injury rates in various countries, there are various statistical findings, but all findings reveal that home injuries are common and costly for the health care system as well as the victims. In a prospective study conducted in Ankara, the incidence of home injuries was determined to be 0.10 per person per year and in another prospective study in İzmir, the incidence was 0.36 per person per year (6, 7). While the annual prevalence rate was 1.3% in people in Turkey, it was 25.3% in houses in Turkey (8, 9). Improving injury surveillance has been a priority for many national and international organizations; however, home injuries are not sufficiently monitored and analyzed in Turkey (10). Although it has been estimated that home accidents are very common in Turkey, the disability rate is unknown. Therefore, the objective of this study was to determine severe home injuries resulting in a disability in 2. İnönü district in İzmir, Turkey.

## METHODS

This cross-sectional study was conducted in 2<sup>nd</sup> İnönü district in İzmir. İzmir is the third biggest city in Turkey and is situated on the western side by the Aegean Sea. İnönü district is a rapidly growing area due to continuous emigration from Eastern Anatolia. The district has slum settlements, apartments, and a heterogeneous population. There were 1,765 households in the district, and the minimum sample size required was estimated to be 326 houses using the Epi-Info 6.0 (CDC, Atlanta, USA) program (p: 50%, d: 10%, and 95% CI). The sample size was sufficient, and the response rate was 75.5%. The district was divided into four sub-districts; these were considered as strata. The population-based weighted sample size was determined for each stratum. The occurrence of a home injury, severe home injury, and disability were considered as dependent variables, whereas sociodemographic characteristics such as age, gender, education, social insurance, perceived income, household density, housing conditions, and housing type (slum settlement or apartment) were considered as independent variables. Selection and recruitment criteria for home injuries were described before the study. First criteria were living in the area. Second, a home injury was defined as any injury that occurred in the

house (kitchen, bathroom, living room, etc.) including the steps, stairs, and front and back yards of the house. Injuries that took place in the street were excluded and were not defined as home injuries. A severe home injury was defined as falling from high level, electrical shock, fire, serious injuries which need to apply emergency, and poisoning. In addition, if a patient was taken to a health care facility for further evaluation due to the severity of injury, it was considered as a severe injury. The impairments of mental, physical, or emotional abilities as a result of injury were evaluated as a "disability." When an injury was identified as a home injury, further questions were asked about the type, time, and location; the activity being held when the injury happened; injured part(s) of the body; etc. Data were collected in July 2003 via face-to-face interviews in every house by conducting an interview with an adult from the family. Before the interview, all people were informed about the aim of the research and the questionnaire and their consents were taken. This research was based on Declaration of Helsinki as a statement of ethical principles for medical researches involving human subjects and there was no any other ethical committee report.

### Statistical Analysis

The chi-square and Fisher's exact tests were used to assess association of independent variables with injuries or disabilities. Logistic regression analysis was used to adjust Odds Ratio (OR) values for home injuries and disabilities. Statistical Package for the Social Sciences version 11.0 (SPSS Inc.; Chicago, IL, USA) was used for data analysis, and  $p < 0.05$  was considered to be statistically significant.

### RESULTS

Data on 1332 people were collected. The prevalence of home injuries was 10.9% (145 people). These injuries happened in 100 houses (30.7% of the houses). The first rank among home injuries was falls (30.3%), which was followed by cuts-sharp object injuries (29.7%) and fire-burns (19.3%). Most injured body parts were reported to be the fingers, hands, and arms (51.7%), which were followed by the head and neck (21.4%). Only 20.7% of those injured sought help at health institutions (30 people), and half of them were treated in emergency departments in hospitals, while others were taken to primary care services. The interviewees reported that the major causes of home injuries were carelessness (37.2%) and housing conditions (stairs, furniture, slippery ground, etc.) (26.9%).

There were 22 severe home injuries (15.1% of the 145 people) such as falling from high (10 injuries), electrical shock (4 injuries), cutting (3 injuries), burns due to fires at home (3 injuries), and poisoning (2 injuries); 9 of these resulted in a disability, which corresponds to a rate of 7 per 1000 (of the 1332 people). Severe injuries and disabilities are listed in detail in Table 1.

Most severe home injuries were falling from high (45%) and took place in slum settlements (77%). Of these severe injuries, nine resulted in a disability (41%). Eight of the nine people with the disability were living in slum settlements. There were no fatalities due to severe home injuries in the study group. The most frequently injured body parts were the arms, hands, and fingers (55%). Table 2 shows the factors affecting home injuries, severe home injuries, and disabilities.

**Table 1. Distribution of severe home injuries**

Injury type (n: 22)	House type	Gender	Age	Disability	Injured body part
1 Falling from high	Slum settlement	M	3	Yes	Arm, hand, finger
2 Falling from high	Slum settlement	F	16	Yes	Polytrauma
3 Falling from high	Slum settlement	F	42	Yes	Head and neck
4 Falling from high	Apartment	M	1	Yes	Head and neck
5 Falling from high	Apartment	F	55	No	Head and neck
6 Falling from high	Slum settlement	M	0	No	Head and neck
7 Falling from high	Slum settlement	M	4	No	Arm, hand, finger
8 Falling from high	Slum settlement	M	6	No	Head and neck
9 Falling from high	Slum settlement	F	57	No	Arm, hand, finger
10 Falling from high	Slum settlement	F	3	Yes	Arm, hand, finger
11 Electrical Shock	Apartment	F	38	No	Arm, hand, finger
12 Electrical shock	Slum settlement	F	50	No	Arm, hand, finger
13 Electrical shock	Slum settlement	F	30	No	Arm, hand, finger
14 Electrical shock	Apartment	F	23	No	Arm, hand, finger
15 Fire	Apartment	F	24	Yes	Polytrauma
16 Fire	Slum settlement	M	45	No	Arm, hand, finger
17 Fire	Slum settlement	M	7	No	Arm, hand, finger
18 Cutting	Slum settlement	M	60	Yes	Arm, hand, finger
19 Cutting	Slum settlement	F	17	Yes	Arm, hand, finger
20 Cutting	Slum settlement	M	46	Yes	Foot
21 Poisoning	Slum settlement	F	43	No	Systemic
22 Poisoning	Slum settlement	M	3	No	Systemic

Factors that were statistically significant for home injuries were gender, age, and perceived income. There were more home injuries among those aged 0-4 (29%) than those with other ages (9%,  $p < 0.001$ ), among women (14%) than among men (7%,  $p < 0.001$ ), and among those with moderate-good income (13%) than among those with bad-very bad income (9%,  $p = 0.018$ ). However, in particular, age groups were statistically associated with severe home injuries and disabilities. Children in the 0-4 age group had more severe injuries (5.4%;  $p = 0.004$ ) and disabilities (2.7%;  $p = 0.014$ ). As demonstrated in Table 2, none of the other sociodemographic variables or house conditions significantly affected severe home injuries and disabilities.

In Table 3, the results of logistic regression analysis results are presented for children in the 0-4 age group for severe home injuries and disabilities.

**Table 2. Factors affecting home injuries, severe home injuries, and disabilities**

Variables	n (n:1332)	Home Injury (n: 145)			Severe Home Injury (n: 22)			Disability (n: 9)		
		n	%	p <sup>a</sup>	n	%	p <sup>a</sup>	n	%	p <sup>a</sup>
<b>Age</b>										
0-4	111	32	28.8%		6	5.4%		3	2.7%	
5-14	253	23	9.1%	0.0001	2	0.8%	0.004	0	-	0.014
≥15	968	90	9.3%		14	1.4%		6	0.6%	
<b>Gender</b>										
Male	668	49	7.3%	0.0001	10	1.5%	0.819	4	0.6%	0.752 <sup>b</sup>
Female	664	96	14.5%		12	1.8%		5	0.8%	
<b>Social security</b>										
Yes	1008	108	10.7%	0.801	14	1.4%	0.282	5	0.5%	0.233 <sup>b</sup>
No	324	37	11.4%		8	2.5%		4	1.2%	
<b>Perceived income</b>										
Bad-										
very bad	561	48	8.6%	0.018	7	1.2%	0.416	4	0.7%	1.000 <sup>b</sup>
Moderate-										
good	756	97	12.8%		15	2.0%		5	0.7%	
<b>House type</b>										
Apartment	522	68	13.0%	0.054	15	1.0%	0.169	2	0.4%	0.496 <sup>b</sup>
Slum settlement	810	77	9.5%		7	2.1%		7	0.9%	
<b>Household size</b>										
≥7	257	257	8.2%	0.149	5	1.9%	0.596	2	0.8%	0.687 <sup>b</sup>
≤6	1075	1075	11.55		17	1.6%		7	0.7%	

<sup>a</sup>: Chi-Square Test  
<sup>b</sup>: Fisher's Exact Test

**Table 3. OR values for children under the age of 5 for severe home injuries and disabilities**

Variable	Severe Home Injury	Disability
	OR (95% CI)	OR (95% CI)
Age		
0-4	4.30 (1.6-11.2)	5.62 (1.4-22.8)
≥5	Ref.	Ref.
Age*		
0-4	4.27 (1.6-11.3)	5.57 (1.3-22.9)
≥5	Ref.	Ref.

\*Adjusted with gender, income, house type, household size, and social security

OR values are presented for children under the age of 5 as unadjusted and adjusted according to gender, perceived income, social security, house type, and household size.

**DISCUSSION**

In this study, home injuries were evaluated in a district in İzmir. In our study, the risk of severe home injuries was nearly four times higher and that of disabilities was nearly six times higher in children under the age of five. Childhood injuries are the most common reason causing death and disabilities worldwide. Many epidemiological studies have indicated that childhood injuries are one of the leading causes of disabilities and that they are an important global public health problem (11-14).

The most frequent type of severe home injuries was falls. This finding was supported by many other studies conducted in Turkey; falls were also found to be the main type of injuries by other

international researchers (5-9,13,15-18). In addition to the present study, most severe home injuries and disabilities took place in the slum settlements. This finding was similar to that found in a study from Sweden; in that study, the most dangerous places for children to get injured were considered to be farms (14).

Another study conducted in 26 European countries found that injuries to children are strongly associated with income inequality and housing conditions (19). We could not show a relationship between income and injury, however housing conditions are very important. Twenty-seven percent of our respondents reported housing conditions (state of the stairs, furniture, slippery ground, etc.) as the major cause of home injuries. Home environmental risk factors are significantly associated with home injuries in different studies (20, 21). When houses are built or renovated, it is necessary to provide safety by installing features such as child-proof windows, oven shields, safety glasses in low windows, and safe furniture and stairs (21).

The importance of falls among home injuries is very clear as over 40% of non-fatal injuries and over 50% of deaths occur due to falls (2). According to a study conducted in Spain, traumatic injuries such as craniocerebral trauma and fractures were identified as the most frequent injuries in children (11). Another serious problem was fire-burns which are similarly defined in Italy (12). We found poisoning and electrocution to be the least likely and least prevalent types of severe home injuries. However poisoning, particularly aspiration of cleaning materials by children, frequently occurs in Turkey (18).

In this study, gender was one of the other influencing factors for home injuries but not for severe home injuries. In a study in Bangalore, the female-to-male ratio was two (4). In a semi-urban Swedish municipality, it was found that there were differences in morbidity between men and women; women showed significantly higher morbidity at home (22). Although men are more likely than women to suffer a fatal injury (men accounted for two-thirds of the total number of deaths due to an injury), home injuries are a very important reason of death and disability for both sexes and in all age groups (17, 23, 24).

The limitation of this study is its study design. The relationship between home injuries and affected factors cannot be accurately determined in cross-sectional studies. However, this research was performed in a mixed urban/slum settlement areas, and the results reflect many social factors for injuries.

Home injuries are an important and preventable health problem. In particular, those with disabilities and their families' future life qualities were affected by these injuries. Setting priorities for the prevention of home injuries is urgent and necessary (25). Indicators for safe homes were defined by Karolinska Institute (26). In addition, some other interventions are based on home safety education and the provision of safety equipment or home-based parenting interventions (27). A preventable injury resulting in a life-long disability decreases the life quality of the victim and results in a higher cost for the health care system as well as the patient's family than the cost incurred for preventing it.

The role of the primary health care team in the prevention of home injuries has been increasingly emphasized. A systematic review on the effectiveness of counselling parents by physicians showed reduced hazards and improved safety behavior (28). Increasing mothers' knowledge was a facilitating factor to prevent home injuries (29). Two effective interventions have demonstrated a reduction in falls among children in the STEADI program in USA (30). Many studies on primary health care interventions have shown reductions in the frequency of home injuries (31, 32). Routine home visits and training mothers who have children under the age of five by primary care workers should be organized to prevent severe home injuries. Thus, a program called "Children Security Program" was recently implemented by the Turkish Ministry of Health at the primary care level in 2016. This program identifies risks about the home environment of injuries in children, and data are collected by primary care nurses and physicians when visiting homes and following up children.

**Ethics Committee Approval:** Authors declared that the research was conducted according to the principles of the World Medical Association Declaration of Helsinki "Ethical Principles for Medical Research Involving Human Subjects", (amended in October 2013).

**Informed Consent:** Written informed consent was obtained from patients who participated in this study.

**Peer-review:** Externally peer-reviewed.

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## REFERENCES

1. Ministry of Social Affairs and Health and Finnish Central Organisation for Rescue Services. Safety at home: direction and ideas for the prevention of domestic accidents and for first aid, 2004.
2. DTI London. Research on the patterns and trends in home accidents. The Department of Trade and Industry, London, 1999
3. Thelot B, Nachbaur C, Mouquet MC, Boyer S. Estimates of annual incidence rates of home and leisure injuries in France. Safety 2004: 7<sup>th</sup> World Conference on Injury Prevention and Safety Promotion, Abstracts Book, Vienna, Austria, 2004.
4. Jayaram A. Domestic accidents in urban India. Safety 2004: 7<sup>th</sup> World Conference on Injury Prevention and Safety Promotion, Abstracts Book, pp:381, Vienna, Austria, 2004.
5. Kılıç B, Meseri R, Sönmez Y, Kaynak C, Demiral Y, Ergör A. Ev kazaları ve etkileyen faktörler. Sendrom 2016; 18:68-74.
6. Kılıç B, Demiral Y, Özdemir C, Özdemir S, Djemalaj F, İlim O, İlişer R, Akgün M, Şentürk B, Şahin F. İzmir'de bir gecekondu bölgesinde evde yaralanma insidansı. Toplum Hekimliği Bülteni 2016; 25:27-32.
7. Hamzaoglu O, Ozkan O, Janson S. Incidence and causes of home accidents at Ankara Çiğiltepe apartments in Turkey. Accid Anal Prev 2002; 34:123-128. [CrossRef]
8. Budakoğlu I, Aksakal FN, İlhan M, Maral I. Ankara ili Gölbaşı ilçesindeki ev kazaları sıklığı. Sağlık ve Toplum 2003; 13:88-91.
9. Erkal S, Şafak S. Ankara Tuzluca'yır Sağlık Ocağı Bölgesinde yaşayan ailelerde ev kazası görülme durumu ve konutların ev kazası riski açısından incelenmesi. Sağlık ve Toplum 2003; 13:96-100.
10. Açikel C, Özcebe H. Türkiye'de kaza ve yaralanma sürveyansı. Sağlık ve Toplum 2005; 15:8-17.
11. Ferraz-Torres M, Belzunegui-Otano T, Martínez-García O, Iriarte-Cerdán L, Salgado-Reguero E. Epidemiological characteristics and overall burden of accidental injuries in Navarra, Spain: Epidemiology of Injuries in Children. J Trauma Nurs 2016; 23:231-236. [CrossRef]
12. Langiano E, Ferrara M, Lanni L, De Vito E. The childhood home accidents: risk perception and behavior. Clin Ter 2016; 167:e49-e54.
13. Ong AC, Low SG, Vasanthala FF. Childhood injuries in Singapore: Can local physicians and the healthcare system do more to confront this public health concern? Int J Environ Res Public Health 2016; 13:E718. [CrossRef]
14. Nilsson K. Parents' attitudes to risk and injury to children and young people on farms. PLoS One 2016; 11:e0158368. [CrossRef]
15. Carter SE, Campbell EM, Sanson-Fisher RW, Gillespie WJ. Accidents in older people living at home: a community based study assessing prevalence, type, location and injuries. Aust N Z J Public Health 2000; 24:633-636. [CrossRef]
16. Wiik J and Bulajic-Kopjar M. Environmental risks factors for fall-related fracture in home among community dwelling elderly people. Safety Science Monitor 1999; 3:1-4.
17. Masson F, Savès M, Salmi LR, Bourdè A, Henrion G, Erny P. Injuries in a problematic socioeconomic context: A population-based study in Reunion, Indian Ocean, 1993-1994. Int J Epidemiol 1997; 26:1033-1040. [CrossRef]
18. Karaman C, Şen S, Erkmen C, Buğa O, Gümüş H. Annelerin evde saklanan malzemelerle ilgili risklere ait bilgi düzeyi. STED 2005; 14:208-211.
19. Sengoelge M, Hasselberg M, Ormandy D, Laflamme L. Housing, income inequality and child injury mortality in Europe: a cross-sectional study. Child Care Health Dev 2014; 40:283-291. [CrossRef]
20. Mott JA. Personal and family predictors of children's medically attended injuries that occurred in the home. Inj Prev 5 1999; 5:189-93. [CrossRef]
21. Hedvall K, Andersson B. Lidköping applies for continued status and designation as a safe community. Lidköping, Sweden, 2003.
22. Ramsay LJ, Moreton G, Gorman DR, et al. Unintentional home injury in preschool-aged children: looking for the key - an exploration of the inter-relationship and relative importance of potential risk factors. Public Health 2003; 117:404-11. [CrossRef]
23. Peden M, McGee K, Krug E (Eds). Injury: A leading cause of the global burden of disease, 2000. WHO, Geneva, 2002.
24. Peden M, McGee K, Sharma G. The injury chart book: a graphical overview of the global burden of injuries. WHO, Geneva, 2002.
25. Mulder S, Blankendaal F, Vriend I, Schoots W, Bouter L. Epidemiological data and ranking home and leisure accidents for priority-setting. Accid Anal Prev 2002; 34:695-702. [CrossRef]
26. Karolinska Institute. Department of Public Health Sciences. Injuries Social Aetiology and Consequences (ISAC) Research Group.
27. Nguyen Thanh V, Clément J, Thélot B, Richard JB, Lamboy B, Arwidson P. Effective interventions to prevent child injuries: a review of the literature. Sante Publique 2015; 27:481-489.
28. Kendrick D, Marsh P, Fielding K, Miller P. Preventing injuries in children: cluster randomised controlled trial in primary care. BMJ 1999; 318:980-983. [CrossRef]
29. Younesian S, Mahfoozpour S, Ghaffari Shad E, Kariman H, Hatam-abadi HR. Unintentional home injury prevention in preschool children; a study of contributing factors. Emerg (Tehran) 2016; 4:72-77.
30. McDonald EM, Mack K, Shields WC, Lee RP, Gielen AC. Primary care opportunities to prevent unintentional home injuries: a focus on children and older adults. Am J Lifestyle Med 2016; 12:2016. [CrossRef]
31. Woods A, Collier J, Kendrick D, Watts K, Dewey M, Illingworth R. Injury prevention training: a cluster randomised controlled trial assessing its effect on the knowledge, attitudes, and practices of midwives and health visitors. Inj Prev 2004; 10:83-87. [CrossRef]
32. Johnson M, Cusick A, Chang S. Home screen: a short scale to measure fall risk in the home. Public Health Nurs 2001; 18:169-177. [CrossRef]