

## 12 yaş altı çocuklarda ev kazalarına bağlı ölümler: Yaralanma türleri ve aile özellikleri

### Deaths due to household injuries among children under 12 years of age: Injury type and family characteristics

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#### ÖZET

**AMAÇ:** Kaza sonucu ölümler alınabilecek önlemlerle azaltılabilir/önlenilebilir ölümler olduğundan adli tıbbın ve koruyucu hekimliğin önemli konuları arasında yer almaktadır. Özellikle yeni hareket kabiliyeti kazanmış bebekler ve oyun çocukları güvenli olması gereken evlerinde kazaya maruz kalmaktadır. Literatürde en sık karşılaşılan ev kazaları düşme, haşlanma, yanma ve zehirlenmelerdir. Bu çalışmanın amacı ailelerin sosyodemografik özelliklerinin, ebeveynin eğitim durumunun ve aile yapısının çocuk ev kazaları sıklığı ve türleri üzerindeki etkisinin araştırılmasıdır.

**YÖNTEM:** Çalışma prospektif olarak tasarlanmış olup Adli Tıp Kurumu İstanbul Morg İhtisas Dairesine otopsi yapılmak üzere gönderilen 12 yaş altı çocuklar çalışmaya dahil edilmiştir. Olay yeri ve otopsi bulguları ile birlikte aile bireylerinden aile yapısı, eğitim durumu ile ilgili alınan bilgilerle çalışma grubu oluşturulmuştur.

**BULGULAR:** Bir yıllık zaman dilimi içerisinde ev ortamında meydana gelmiş kaza sonucu ölen 31'i erkek, 22'si kız olmak üzere 53 çocuk olgu otopsi yapılmak üzere gönderilmiştir. Ortalama yaş  $4,32 \pm 2,95$  olarak bulunmuştur. Olaylar çocuğun kendi eylemi (ÇKE) ve çocuktan bağımsız (ÇB) olmak üzere iki ana grup altında değerlendirilmiştir. ÇKE sonucu meydana gelen kazalarda annenin yaş ortalaması  $28,82 \pm 5,68$ , babanın yaş ortalaması ise  $33,26 \pm 5,65$ 'tir. ÇKE sonucu oluşan kaza grubunda düşme en sık görülen kaza türü olmuştur ( $n=20$ , %37,7 tüm gruplarda, ÇKE grubunda %58,8). Yüksekten düşmeler ilkbahar ve yaz mevsiminde daha sık görülmüştür. Çocuğun cinsiyeti ile olay türü arasında istatistiksel anlamlı bir ilişki bulunmazken ailenin düşük eğitim düzeyi ile olay türü arasında anlamlı bir ilişki bulunmuştur. Düşük eğitim düzeyli ailelerde yüksekten düşmeler diğer gruplara göre fazla sayıda bulunmuştur. annesi çalışan çocukların yaş ortalaması anlamlı düzeyde yüksek bulunmuştur ancak annenin çalışma durumu ile olay türü arasında anlamlı bir ilişki bulunamamıştır.

**SONUÇ:** Sıcak havalarda evlerdeki açık balkon kapıları ve pencereler çocuklar için önemli bir risk faktörüdür. Küçük çocuk yaşı yüksekten düşmeler için bir risk faktörü olarak bulunmuştur. Er-

#### ABSTRACT

**INTRODUCTION:** Accidental deaths are important subjects of Forensic Medicine and Preventive Medicine that are preventable / reducible causes of death with taking necessary measures. Especially babies, newly acquiring moving abilities and toddlers have accidents in their houses where they are supposed to be safe. In the literature most encountered injury types of household accidents are due to falls from height, scalds, burns and intoxications. Aim of this study is to determine effects of socio-demographic characteristics of families, parental education degrees and family structure on frequencies and types of childhood domestic accidents.

**METHODS:** Study designed as a prospective study. Case group include the pediatric autopsy cases, under 12 years old, of İstanbul Morgue Department of Council of Forensic Medicine. With death scene and autopsy findings; family structure and educational status information that taken from the relatives were evaluated.

**RESULTS:** Incident types evaluated in two main groups: Own action of child (OAC) and Independent from child's action (IfCA). In OAC group mean age of mothers were  $28.82 \pm 5.68$  years (range 15 to 43), fathers mean age was found  $33.26 \pm 5.65$  years (range 22 to 44). In one year period 53 child death cases including 31 boys and 22 girls with a mean age of  $4.32 \pm 2.95$  were referred to determine the cause of death after a household accident. Falls from height ( $n=20$ , 37.7% in all groups and 58.8% in OAC group) was the most common accident type in OAC group. Falls from heights were common in spring and summer seasons. There was no significant relationship between sex of child and accident type. But there was a statistically significant relationship between low parental education degree and accident type. In the low educated parent group falls from heights were more frequent than other groups. Ages of children were found significantly higher in the group whose mothers were employed and there was no relationship between mother employment and accident type.

**CONCLUSION:** These findings showed us that opened windows or balcony doors in warm weather were important risk fac-

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ken çocukluk döneminde dengesiz motor aktiviteleri ve motor gelişim seviyesinin yetersizliği bunun sebebi olarak düşünülmüştür.

Çalışmanın sonucu olarak çocukların korunması ve evlerde kazalara karşı alınabilecek tedbirler konusunda ailelerin eğitilmesinin ev ortamında çocukların geçireceği kazaları azaltmada en önemli faktör olduğu düşünülmüştür. Kaza sonucu çocuk ölümlerinin engellenmesinde ilk basamak ailelerin ev ortamındaki tehlikelerin farkında olmasının sağlanmasıdır.

**Anahtar Kelimeler:** Ev kazaları, çocuk, aile yapısı, ailelerin eğitim düzeyi.

tors for childhood accidental injuries. Low child age was found as a risk factor for falls from heights. In early childhood motor immaturity with imbalanced motor activities, were thought to be the most important factor on this finding. As a conclusion educating families about childcare and about measures should be taken to avoid accidents, was thought to be the most important factor on decreasing childhood accidental injuries. First step of preventing accidental childhood injuries is increasing the awareness of parents about dangers in the household environment.

**Keywords:** Household accidental death, child, family structure, education status of parents.

## INTRODUCTION

Deaths due to household accidents are mostly preventable, provided the appropriate measures are taken. Children especially act without awareness of the hazards that exist in the home. Any furniture that a child may climb, furniture that may tip over onto the child, or open windows or balcony doors may be hazards for children.

Studies have shown that there are many risk factors for injuries among children in the household environment. The predominant familial risk factors are a low parental education level, young parents, many siblings, low social class, low income, and unemployment [1-5]. Most of these risk factors are also related to the act of supervision. Morrongiello defined supervision as "directly observing and attending to the child" and knowledge about "how the child usually behaves" (6). Due to the unpredictable and risk-taking behavior of children, or due to their newly acquiring motor skills, the most effective safety strategy in the home may be to take appropriate preventive measures. It is a fact that a lack of supervision leads to accidents and injuries, even though continuous around-the-clock supervision may be impossible. On this point, awareness of the measures to take comes to the forefront. Determining the right target group, education strategy, and awareness-raising methods should be the first step to preventing accidental household injuries.

The literature contains many studies on accident types, children's characteristics, and the hazards

in the household environment. However, more studies are needed to reveal the family characteristics, sociodemographic features of families, and education levels of families in Turkey, to determine the target group(s) for an educational intervention. The purpose of this study is to identify the relations between the accident types, age of children, family structure, and the education and occupation statuses of parents, and determine the family risk factors for such accidents.

## MATERIAL AND METHODS

### Case selection

The study group consulted the caseload of Istanbul Morgue Department of the Council of Forensic Medicine of Turkey reporting the cases of death due to household injuries among children under 12 years of age from 1 August 2012 to 31 July 2013. The data included incident and occurrence types, ages of the parents, family structure (number of children; marital status of the parents; if it was a nuclear or extended family), education level, and employment status of the parents, and they were collected via interviews with the parents or from the police/prosecutor records with a structured checklist.

### Case classification

The incident types were primarily divided into two groups: (1) incidents that arose due to the own

**Table 1:** Descriptive statistics

		<b>OAC (n=34)</b>	<b>IfCA (n=19)</b>
<b>Child age (years)</b>	<b>Min-max (median)</b>	1-11 (3)	1-13 (6)
	<b>Meant±SD</b>	3.21±2.21	6.37±3.2
<b>Mother age (years)</b>	<b>Min-max (median)</b>	15-43 (28.5)	21-35 (32)
	<b>Meant±SD</b>	28.82±5.68	28.74±5.35
<b>Father age (years)</b>	<b>Min-max (median)</b>	22-44 (32.5)	23-40 (35)
	<b>Meant±SD</b>	33.26±5.65	31.53±5.4
<b>Number of children in the family</b>	<b>Min-max (median)</b>	1-7 (2)	2-6 (3)
	<b>Meant±SD</b>	2.38±1.28	3.53±1.39
<b>Sex; n (%)</b>	<b>Boy</b>	20 (58.8)	11 (57.9)
	<b>Girl</b>	14 (41.2)	8 (42.1)
<b>Number of siblings; n (%)</b>	<b>1 child</b>	9 (26.5)	0 (0)
	<b>2-3 children</b>	20 (58.8)	11 (57.9)
	<b>4 children or more</b>	5 (14.7)	8 (42.1)
<b>Mother education status; n (%)</b>	<b>Non-literate</b>	2 (5.9)	0 (0)
	<b>Literate. no education</b>	1 (2.9)	0 (0)
	<b>Elementary</b>	25 (73.5)	11 (57.9)
	<b>High school</b>	1 (2.9)	2 (10.5)
	<b>University</b>	1 (2.9)	0 (0)
	<b>Not-known</b>	4 (11.8)	6 (31.6)
<b>Father education status; n (%)</b>	<b>Non-literate</b>	1 (2.9)	0 (0)
	<b>Elementary</b>	25 (73.5)	9 (47.4)
	<b>High school</b>	3 (8.8)	4 (21.1)
	<b>University</b>	1 (2.9)	0 (0)
	<b>Not-known</b>	4 (11.8)	6 (31.6)
<b>Mother employment; n (%)</b>	<b>Not employed</b>	30 (88.2)	14 (73.7)
	<b>Employed</b>	4 (11.8)	5 (26.3)
<b>Father employment; n (%)</b>	<b>Employed</b>	34 (100)	19 (100)
<b>Babysitter; n (%)</b>	<b>Mother</b>	31 (91.2)	17 (89.5)
	<b>Father</b>	1 (2.9)	0 (0)
	<b>Grand Parents</b>	1 (2.9)	2 (10.5)
	<b>Alone child</b>	1 (2.9)	0 (0)
<b>Family structure</b>	<b>Nuclear family</b>	28 (82.4)	18 (94.7)
	<b>Extended family</b>	6 (17.6)	1 (5.3)

<b>Year; n (%)</b>	<b>2012</b>	24 (70.6)	2 (10.5)
	<b>2013</b>	10 (29.4)	17 (89.5)
<b>Season; n (%)</b>	<b>Spring</b>	5 (14.7)	10 (52.6)
	<b>Summer</b>	14 (41.2)	1 (5.3)
	<b>Fall</b>	11 (32.4)	2 (10.5)
	<b>Winter</b>	4 (11.8)	6 (31.6)
<b>Incident type; n (%)</b>	<b>Fall from height</b>	20 (58.8)	0 (0)
	<b>Jamming</b>	4 (11.8)	0 (0)
	<b>Firearm related</b>	0 (0)	2 (10.5)
	<b>Furniture tip-over</b>	3 (8.8)	0 (0)
	<b>Stove-poisoning</b>	0 (0)	11 (57.9)
	<b>Scald</b>	3 (8.8)	0 (0)
	<b>Drowning</b>	1 (2.9)	0 (0)
	<b>Foreign body aspiration</b>	2 (5.9)	0 (0)
	<b>Remain closed</b>	1 (2.9)	0 (0)
	<b>Arson</b>	0 (0)	6 (31.6)
<b>Cause of death; n (%)</b>	<b>Traumatic</b>	23 (67.6)	0 (0)
	<b>Asphyxia</b>	7 (20.6)	0 (0)
	<b>Firearm</b>	0 (0)	2 (10.5)
	<b>Drowning</b>	1 (2.9)	0 (0)
	<b>Smoke inhalation</b>	0 (0)	1 (5.3)
	<b>Poisoning</b>	0 (0)	11 (57.9)
	<b>Burn-Scald</b>	3 (8.8)	5 (26.3)

action of the child (OAC group) and (2) incidents that arose independent of the child's action (IfCA group). The OAC group comprised cases of falls from heights; jamming; furniture tip-over; scalding; drowning; foreign body aspiration; and cases that remain closed. The IfCA group consisted of arson and coal-stove poisoning (carbon monoxide or smoke inhalation) cases.

## Statistical analyses

NCSS (Number Cruncher Statistical System) 2007 and PASS (Power Analysis and Sample Size) 2008 Statistical Software (Utah, USA) were used for the statistical analyses. In addition to descriptive statistical methods including the mean, standard deviation, median, frequency, rate, minimum,

and maximum to analyze the quantitative data, and a Mann-Whitney U Test was used to compare the two groups, which were not normally distributed. The Pearson Chi-Square test, Yates Continuity Correction, Fisher's exact test, and Fisher-Freeman-Halton tests were used to compare the qualitative data. Furthermore, an evaluation of the correlations between parameters was conducted using Spearman's correlation. Significance was evaluated at  $p < 0.01$  and  $p < 0.05$ .

## RESULTS

In the one year period, 4,606 cases were autopsied in the Morgue Department of the Council of Forensic Medicine. Fifty-three household injury

**Table 2:** Evaluation of incident types and sex in OAC group

Incident type	Sex		p
	Boy	Girl	
	n (%)	n (%)	
Fall from height	12 (60.0)	8 (57.1)	<sup>a</sup> <b>1.000</b>
Jamming	2 (10.0)	2 (14.3)	<sup>b</sup> <b>1.000</b>
Furniture tip-over	1 (5.0)	2 (14.3)	<sup>b</sup> <b>0.555</b>
Scalding	3 (15.0)	0 (0)	<sup>b</sup> <b>0.251</b>
Drowning	1 (5.0)	0 (0)	<sup>b</sup> <b>1.000</b>
Foreign body aspiration	0 (0)	2 (14.3)	<sup>b</sup> <b>0.162</b>
Remain closed	1 (5.0)	0 (0)	<sup>b</sup> <b>1.000</b>

<sup>a</sup>Yates's Continuity Correction Test    <sup>b</sup>Fisher's Exact Test

cases, under 12 years old, were referred to the morgue to determine the cause of death using the history of injury due to household accidents. The mean age was  $4.32 \pm 2.95$  years. Thirty-one cases were boys (58.5%) and 22 cases were girls (41.5%), with an overall male-to-female ratio of 1.4:1.

Thirty-four out of 53 cases were classified in the OAC group and 19 in the IfCA group. In the OAC group, the male-to-female ratio was 1.42:1, and it was 1.37:1 in the IfCA group. Due to the objectives of this study, only the OAC group is evaluated and discussed in this paper. The descriptive features of the cases for both groups are shown in Table 1.

No statistically significant correlation was found between sex and incident types within the OAC group ( $p > 0.05$ ). However, there was a statistically significant correlation between season and incident types within the OAC group ( $p < 0.05$ ); there was a significant increase in the rate of falls from heights in summer and fall (Table 2 and 3).

The distribution of incident types according to mother's and father's education status, mother's employment, number of siblings, and family structure is shown in Table 4. No statistically significant correlation was found between mother's employment status and incident type, between the number of children in the family and incident type, or between family structure and incident type within the OAC group ( $p > 0.05$ ).

The mean age of the children with an employed mother was  $5.50 \pm 3.87$ , while it was  $2.90 \pm 1.79$  for those with an unemployed mother. Due to the low number of cases, a statistical evaluation was not performed. There was no statistically significant difference between the child's age and family structure ( $p > 0.05$ ) (Table 5). Furthermore, there was no statistically significant difference between the mother's and child's ages or between the father's and child's ages ( $p > 0.05$ ) (Table 6).

## DISCUSSION

According to the reports of the World Health Organization (WHO) and UNICEF, hundreds or thousands of children die every year due to various injuries or violence, and millions suffer the consequences of disability due to injuries (7). Injuries are important health issues in preventive medicine due to their preventability, in stark contrast to mortality or morbidity due to diseases. Regardless of the income level of the community or developmental level of the country, injuries form an important part of the deaths of those under 14 years of age, according to the book *Injury: A Leading Cause of the Global Burden of Disease*, published by the WHO in 2000 and referring to numerous studies on this topic (8). The results of studies carried out in Turkey pointed in the same direction. Yüksel et al., in 2000, reported accidents, infectious diseases, and malnutrition as the leading

causes of death among children aged one to five years (9). Arslanköylü et al., in 2012, reported that 15% of children's admissions to the child intensive care unit were due to preventable accidents (10). Aşirdizer et al., in 2005, stated that the ratio of autopsied children's causes of death due to household injuries was 3% of the whole annual caseload, and 26% among cases of children under 18 years of age (11).

A child lacks cognitive awareness of hazards and skills for avoidance, and combined with their innate curiosity and desire to explore, they are able to encounter hazards in the household environment. According to the 2001 report of UNICEF-Innocenti Research Centre, "A League Table of Child Deaths by Injury in Rich Nations," injuries were the leading causes of death among children aged between 1 and 14 years (12). This report included all injury types, including household injuries (e.g., traffic accidents).

According to a 2008 WHO report, intracranial injuries were the most frequent injury types in the accidents of children under 15 years of age (7). Runyan et al., reported that the most frequent accident type causing mortality and morbidity in all age groups was a fall from a height. Most of these injuries were seen in children and the elderly (13, 14).

There have been discrepancies between the studies on injury types, but the research indicates that the leading injury types are falls from heights,

burns, and poisonings. According to the study of Arslanköylü et al., the two most frequent reasons for children's admission to the intensive care unit were poisoning (64.6%) and trauma (17.7%) (10). Erkal, in 2010, reported that the frequency of household accidents was 37.9% among 0–6 year-old children of the participant mothers in a one-year period, and the most frequent accident type was falls from heights, at a rate of 75.4%, followed by burns and scalds with the ratio of 11.8% (15). According to the study of Le Blanc et al., in 2006, evaluating five children's emergency departments of different hospitals, the most common reasons for admission were falls from heights, burns, and poisonings, at 50.4%, 22.8%, and 16.0%, respectively (16). Alptekin et al. reported that 27.4% of their study group, which included all unintentional, non-fatal household injury admissions to their health center, consisted of 0–14 year-olds in a one-year period, and falls were the leading cause of injury in the 5–9 year-old group (17). Moreover, Perez-Suarez E et al. reported that 43% of all pediatric intensive care unit admissions due to polytrauma were the consequences of falls (18).

Accidents due to furniture tip-over (especially televisions), which can be prevented easily by taking the appropriate measures, are widely reported in the related literature (19-30). In the literature, toddlers are reported to be in the elevated risk group for furniture tip-over accidents. It is not surprising that toddlers are more curious, more active, and may be more mischievous during this

**Table 3:** Evaluation of incident types and Season in OAC group

Incident type	Season				p
	Spring (n=5)	Summer (n=14)	Fall (n=11)	Winter (n=4)	
Fall from height	1 (20.0)	12 (85.7)	6 (54.5)	1 (25.0)	<b>0.019*</b>
Jamming	2 (40.0)	1 (7.1)	0 (0)	1 (25.0)	<b>0.086</b>
Furniture tip-over	0 (0)	0 (0)	2 (18.2)	1 (25.0)	<b>0.182</b>
Scalding	1 (20.0)	0 (0)	2 (18.2)	0 (0)	<b>0.228</b>
Drowning	0 (0)	0 (0)	1 (9.1)	0 (0)	<b>0.588</b>
Foreign body aspiration	0 (0)	1 (7.1)	0 (0)	1 (25.0)	<b>0.439</b>
Remain closed	1 (20.0)	0 (0)	0 (0)	0 (0)	<b>0.265</b>

†Fisher-Freeman-Halton Test \*p<0.05

**Table 4:** Evaluation of Incident types and parental education status. Mother employment. Family structure and number of siblings in OAC group

Incident type	Fall from height	Jamming	Furniture tip-over	Scalding	Drowning	Foreign body aspiration	Remain closed
<b>Mother's education status</b>							
Non-literate (n=2)	1 (50%)	-	-	1 (50%)	-	-	-
Literate. no educ.(n=1)	-	-	-	-	-	-	-
Elementary (n=25)	15 (60%)	2 (8%)	3 (12%)	2 (8%)	1 (4%)	1 (4%)	1 (4%)
High School (n=1)	1 (100%)	-	-	-	-	-	-
University (n=1)	1 (100%)	-	-	-	-	-	-
Not-known (n=4)	2 (50%)	1 (25%)	-	-	-	1 (25%)	-
<b>Father's education status</b>							
Non-literate (n=1)	-	-	-	1 (100%)	-	-	-
Elementary (n=25)	16 (64%)	2 (8%)	2 (8%)	2 (8%)	1 (4%)	1 (4%)	1 (4%)
High School (n=3)	2 (66.7%)	-	1 (33.3%)	-	-	-	-
University (n=1)	-	1	-	-	-	-	-
Not-known (n=4)	2 (50%)	1 (25%)	-	-	-	1 (25%)	-
<b>Mother employment</b>							
Not employed (n=30)	17 (56.7%)	3 (10%)	3 (10%)	3 (10%)	1 (3.3%)	2 (6.6%)	1 (3.3%)
Employed (n=4)	3 (75%)	1 (25%)	-	-	-	-	-
<sup>a</sup> p	0.627	0.409	1.0	1.0	1.0	1.0	1.0
<b>Number of children in family</b>							
1 (n=9)	8 (88.9%)	-	1 (11.1%)	-	-	-	-
2-3 (n=20)	10 (50%)	3 (15%)	2 (10%)	2 (10%)	1 (5%)	2 (10%)	-
>3 (n=5)	2 (40%)	1 (20%)	-	1 (20%)	-	-	1 (20%)
<sup>p</sup>	0.094 <sup>b</sup>	0.447 <sup>c</sup>	1.0 <sup>c</sup>	.524 <sup>c</sup>	1.0 <sup>c</sup>	1.0 <sup>c</sup>	1.0 <sup>c</sup>
<b>Family structure</b>							
Nuclear	18 (64.3%)	3 (10.7%)	3 (10.7%)	2 (7.1%)	-	2 (7.1%)	-
Extended	2 (33.3%)	1 (16.7%)	-	1 (16.7%)	1 (16.7%)	-	1 (16.7%)
<sup>a</sup> p	0.202	0.559	1.0	0.453	1.0	1.0	1.0

<sup>a</sup> Fisher's Exact Test    <sup>b</sup>Pearson Chi-square Test    <sup>c</sup>Fisher-Freeman-Halton Test

period of childhood. Murray et al. reported that boys between one and four years of age were at a high risk of suffering television tip-over injuries, and the most frequent injury type associated with this was head trauma (19). According to the study of Rutkoski et al., 65.4% of the children admitted to the children's hospital with a television tip-over injury were between 18 months and 3 years old, and that the leading admission diagnosis in such cases was traumatic brain injury (23). Similarly, Güloğlu et al. stated the same age group and sex as the most frequent cases of injury due to television tip-over. Further, according to their study, the leading cause of death was head trauma (25).

There is a slight dominance of males in household injuries, which the results of our study support (10, 15, 31-33). Thus, being male may be a risk factor for household accidents among children. Another risk factor may be the season. Lallier et al., in 1999, reported that falls occurred in summer and from the balcony or window of the house (25). Perez-Suarez et al. supported this result, reporting that 66% of falls occurred in warm months (12). In our study, 41.2% of the deaths due to accidental household injury occurred in summer.

There are discrepancies among different studies regarding age. Lallier et al., reported that 36% of the cases of falls from heights were under 4 years of age, and 70% were under 10 years of age (32). Tsoumakas et al. emphasized that the risk of a household accident for children aged three-to-four years was two times more than children under three years of age (34). According to LeBlanc et al., 47% of children's emergency room admissions due to household injuries were those under one year of age (35). In our study, the mean age of the OAC group was  $3.21 \pm 2.21$ . With this knowledge, none of the age groups could be classified as a risk group.

Accordant with the literature, the results of the present study showed that boys had slightly more accidents in the home, the most frequent cause of death was traumatic death, the most frequent injury type was a fall from a height, and the mean age was  $3.21 \pm 2.21$ .

Previous studies have shown that the mothers of the children who experiences household injuries tended to be young adults. In the study of LeBlanc et al. evaluating pediatric emergency room admis-

**Table 5:** Evaluation of mother employment; family structure; incident type and child age in OAC group

n		Min-max (median)	Age (years)		°p
			Meant±SD		
Mother employment	Not employed	30	1-10 (3)	2.90±1.79	-
	Employed	4	2-11 (4.5)	5.50±3.87	
Family structure	Nuclear family	28	1-10 (3)	3.04±1.86	0.659
	Extended family	6	1-11 (3)	4.00±3.58	
Incident type	Fall from height	20	1-10 (2.5)	3.15±2.08	
	Jamming	4	1-11 (2.5)	4.25±4.72	
	Furniture tip-over	3	3	3.00±0.00	
	Scalding	3	3	3.00±0.00	
	Drowning	1	1	-	
	Foreign body aspiration	2	2-4 (3)	3.00±1.41	
	Remain closed	1	4	-	

°Mann Whitney U Test2

**Table 6:** Correlation between Mother. Father and Child ages in OAC group

	<b>r</b>	<b>p</b>
<b>Mother * Child age</b>	-0.046	0.797
<b>Father * Child age</b>	-0.040	0.821

r: Spearman's Correlation Coefficient

sions, it was reported that the mothers were between 25 and 35 years of age in cases of accidental injury in the home (35). In cases of children's home injuries in Denmark, Laursen and Nielsen stated that at childbirth, most mothers were between 25 and 35 years old (2). Similarly, Hjern et al. identified the mother's age at childbirth as between 24 and 28 years among children's hospital admissions due to accidental injury in the home (3). However, the mother's age alone is not sufficient for evaluating the family risk factors. Palmiere et al. mentioned drug addicted parents in their two cases of child deaths due to household accidents (36). In addition, Erkal stated that mothers with a higher education, fewer children, living in an extended family environment, and with a higher income, were more deliberative about the risk of household injuries (15). Furthermore, young age (0–6 years), being male, and being of a low socioeconomic status were consistent risk factors for all fall injuries across the studies in the systematic review of Khambalia et al. (37).

The opinions and findings about the relationship between a mother's level of education and household accidents have differed. Some studies found that higher education levels reduced the risk of accidental injuries among children, but other studies revealed that a mother's level of education was directly proportional to the risk of having an accident (34). Lower education levels of mothers emerged as a risk factor for children's household accidents in the studies of Pearce et al. and Tiikkaja et al. (38, 39). The literature also expresses the belief that an increase in the professional responsibilities of the mother reduces the time spent at home and thus reduces the supervision at home (34). However, the results of the study of Dal Santo et al. were quite different. They stated that the mother's level of education

and age, the number of children, and the marital status of the parents were not significant predictors, but the occupation of the mother was a significant factor. The children of unemployed or part-time employed mothers were at a 2.14 times higher risk of injury per unit time than the children of full-time employed mothers (40).

In the present study, the children who had died due to accidents resulting from their own actions were more frequently those of parents with only an elementary school education and living in a nuclear family structure (82.4%). The father was often the financial supporter of the household, and the mother was often unemployed (88.2%) and in charge of the child rearing (91.2%). According to the Turkish Institute of Statistics and the book *Research on Family Structure in Turkey: Findings, and Recommendations* published by the Ministry of Family and Social Politics of Turkey in 2014, the sociodemographic data of our study overlap with the general Turkish family structure data (41, 42). These data showed us that the family structure of the children who died due to household accidents did not differ from the general family structure. This deduction led to the problem of determining the target population for the educational intervention.

In some studies, low social class, non-educated parents, many children in the home, young parents, and the absence of one parent were shown as sociodemographic risk factors for household accidents, and the authors suggested educational interventions targeting those groups (2). However, our study results suggest that the target population for education about measures for preventing household injury would be a large portion of the Turkish population. Therefore, we need educational methods targeting large communities.

Solutions should be found for teaching about hazards in the household environment, including suggestions about measures that should be taken, and awareness must be raised about the total prevention of childhood morbidity and mortality due to household accidents if caregivers take the appropriate preventive measures. Most importantly, the target physician group in this mission should be family practitioners. During all visits,

doctors should interview parents on this subject and distribute brochures informing the parents about the measures that they should take. In ad-

dition, public service broadcasting on primetime television about this subject may help to increase public awareness of household accidents.

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