

# The Evaluation of Two Different Parental Training Methods on Maternal Awareness and Home Safety Behaviors for Childhood Injury Prevention

Çocukluk Çağı Kazalarından Korunmada Ev Güvenliği Davranışları ve Anne Farkındalığı Üzerine İki Farklı Ebeveyn Eğitim Programının Değerlendirilmesi

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**Aim:** The aim of this study was to examine the effectiveness of two different parental training programs on improving both maternal awareness for childhood injury and safety behaviors.

**Material and Methods:** Seventy-four mothers whose children aged from 0 to 6 years were participated. Forty-seven mothers (Group 1) were taken to an education seminary program for childhood home injuries. Other twenty-seven mothers (Group 2) were given an education pamphlet. One month later, a home visit program was done. The level of maternal awareness for injury risk was evaluated before training and at home visits. Home safety level was measured based on a form including home injury hazards and safety practices of mothers that were accomplished within the period following intervention. The level of maternal risk perception about home injuries was measured with a scale.

**Results:** The awareness levels of the mothers in Group 1 were significantly higher than Group 2. Total home safety score was significantly higher in Group 1 ( $p=0.040$ ). The mothers of Group 1 were more inclined to improve the injury hazards in their home, and they were more likely to report child home injuries as more seriously. The mothers with higher level of awareness about injury risks indicated home injuries as more seriously.

**Conclusion:** The focused, interactive injury education of the mothers may be an effective intervention for improving the maternal awareness and home safety.

**Key Words:** home injury, prevention

**Amaç:** Bu çalışmanın amacı; çocukluk çağı kazalarında annenin farkındalığı ve ev güvenliği davranışının iyileştirilmesi üzerine iki farklı ebeveyn eğitim programının etkinliğini incelemektir.

**Gereç ve yöntemler:** Çocuğu 0-6 yaş arasında olan 74 anne çalışmaya alınmıştır. Kırk yedi anneye (Grup 1) çocukluk çağı kazaları ile ilgili bir eğitim seminer programı verilmiştir. Diğer 27 anneye (Grup 2) ise bir eğitim broşürü verilmiştir. Bir ay sonra annelere ev ziyareti yapılmıştır. Kaza riskine karşı anne farkındalığı düzeyi, eğitimden önce ve ev ziyaretlerinde değerlendirilmiştir. Evdeki kaza riskleri ve annelerin eğitimden sonraki dönemde aldıkları güvenlik önlemlerini içeren bir form temel alınarak ev güvenlik düzeyleri ölçülmüştür. Annelerin ev kazaları konusundaki risk algısı bir ölçek ile değerlendirilmiştir.

**Sonuçlar:** Grup 1'deki annelerin farkındalık düzeyleri Grup 2'den belirgin yüksek bulunmuştur. Toplam ev güvenlik puanları Grup 1'de belirgin yüksektir ( $p=0.040$ ). Grup 1'deki anneler evlerinde kaza risklerini düzeltmeye daha eğilimlidir ve bu anneler ev kazalarının ciddi olduğunu daha fazla düşünmektedir. Kaza riskleri konusunda farkındalığı yüksek olan anneler, kazaları da daha ciddi olarak değerlendirmektedir.

**Sonuç:** Annelerin interaktif ve odaklı kaza eğitimleri ev güvenliğini ve anne farkındalığını iyileştirmede etkili bir müdahale yöntemi olabilir.

**Anahtar Sözcükler:** ev kazaları, korunma

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Home injuries remain an important cause of morbidity and mortality among young children.<sup>1</sup> Previous data show that children's risk of injury has been associated with parental demographic and psychosocial characteristics

including personality attributes, risk perception levels and supervisory patterns, and child characteristics including temperament, behavioral attributes and developmental levels (1-3).

As many injuries sustained by children in the home are related to a lack of appropriate safety measures, it is expected that the occurrence of childhood injury could be reduced through use of appropriate safety measures and injury prevention practices (2,4). Due to their increased susceptibilities, children are highly dependent on adult provision of a safe environment and protection from contact with hazards (5). Further, parental attitudes and behaviors are an important consideration in designing successful injury interventions (6). Therefore, prevention efforts directed to parents such as interactive education programs, home-based parent education programs, and the provision of safety devices free of charge or at reduced cost or the combination of these interventions have been conducted in recent years with the aim of the improvements of parental home safety behaviors (7-9). However, the optimal intervention to improve safety practices and reduce injuries is unclear. Given the variety of parent education programs for the prevention of child injury, there is inconsistent evidence to indicate whether such interventions are effective in improving parental awareness about injury risks and home safety behaviors.

The aim of this study, therefore, was to examine the effectiveness of two different paternal training programs conducted on a well-child clinic, either providing an interactive seminar program or giving an education pamphlet, on the improvement of both maternal awareness regarding home injuries and maternal home safety behaviors.

## Material And Methods

This study was conducted at the Division of Social Pediatrics of the School of Medicine, Ankara University. Ethics approval was obtained from the Ethics Committee of the Institute of Health Sciences. This study has been conducted in line with the principles of the Declaration of Helsinki. The informed consent to participate in the study was also obtained from participants.

### Study design:

Seventy-four mothers with children aged from 0 to 6 years who had attended well-child visits in Division of Social Pediatrics were participated in the study. A baseline interview questionnaire was administered at the time of study enrolment to obtain sociodemographic characteristics of mothers and home injury histories of their children.

The study plan was based on two distinct models of training in two individual groups. Into the first group were included those mothers, who attended a 3-hours training seminar provided by the researchers in a seminar hall of the hospital (Group 1) (n=47). This program was an interactive, face-to-face program, which includes 6-8 parents in each session. Whereas those mothers, who, albeit of having accepted to participate to the study in order to attend the training seminars, did not want to or wanted to but could not attend such trainings that required a half-day attendance, were included into the second group who were given a pamphlet (Group 2) (n=27). The pamphlet consists of all knowledge of the seminar program. Training seminar program and pamphlet comprised the knowledge including the causes of childhood home injuries according to children age groups, risk factors for home injuries, causes in home setting for childhood injuries, injury prevention practices at home, parent behaviors and attitudes regarding home injuries, and first aid practices following a home injury. One month later of training seminar or pamphlet provision, home visits for all participants in both groups were conducted with attendance of all researchers. At home visits, home safety behaviors of mothers and safety practices accomplished by mothers identified.

### Measures

In the present study, various measures presented below were used for the evaluation of the effects of two different maternal training approaches on maternal awareness and home safety behaviors. Due to the potential

effects of child temperament and maternal risk perceptions on both current home safety behaviors and on designing appropriate injury interventions by participants, we developed a child temperament evaluation scale and a maternal perception for injury risk scale.

#### Child temperament evaluation

The mothers filled a questionnaire measuring their child's temperament. A semantic differential task to assess maternal perceptions of child's temperament was designed based on Mueller's principles about measuring social attitudes(10). This questionnaire consists of nine potentially evaluative adjective pairs (*attentive-inattentive, weak-strong, uncommunicative-sociable, passive-active, easily-hardly cared, undisturbed-disturbed, slowly-speedy, fearful-fearless, and kind-crude*), which show potentially risky and risk-free temperament patterns of children regarding home injury. Mothers were asked to mark the field they thought best fitting their child's temperament. In scoring this semantic differential, each item (adjective pair) contributed from one to nine points to the total score, the most favorable response receiving a "1" and the most unfavorable a "9." For each mother, the marks of each item were summed to obtain a '*maternal perception score for child temperament.*' Thus, this semantic differential had a score range from 9 to 63, with mothers perceiving their infants as easy managed having lower scores; and those perceiving their infants as hardly managed having higher scores. The scale had an internal consistency (Cronbach alpha coefficient) of 0.80.

#### Maternal risk perception evaluation

A scale, which was developed from a scale using in a previous study,<sup>3</sup> was used in order to evaluate maternal risk perceptions about childhood injury at home visit.

This scale consists of four part regarding maternal risk perceptions about 23 injury types. The domains were perceptions of *risk* of injury, perceptions of *seriousness* of injury, perceptions of

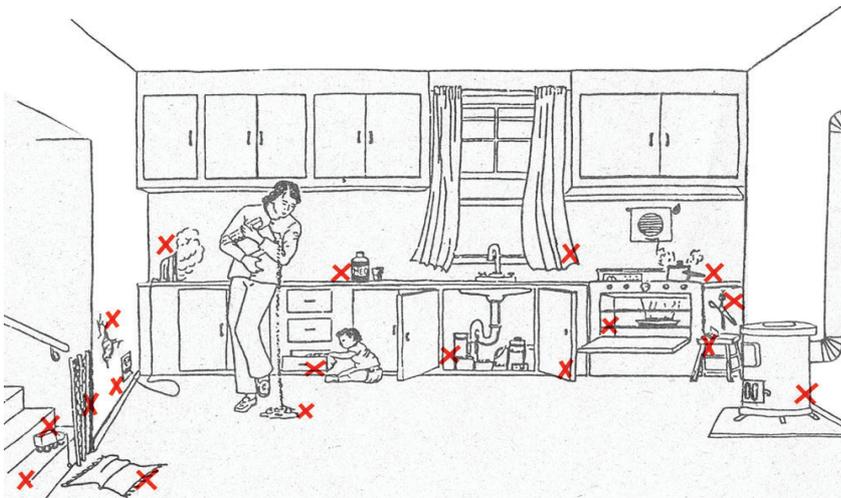


Figure 1: The picture showing the injury risks at home for the children (Kelly et al 1987).

anxiety about injury risks and perceptions of self-confidence on injury intervention. The questions were 'What is the probability that your child would experience such an injury?', 'How serious would you consider such an injury?', 'To what extent does the possibility makes you concerned that your child would experience such an injury?', and 'To what extent could you cope with the circumstance in which your child would experience such an injury?' in first, second, third and fourth part, respectively. Within each of these domains there were dimensions including five point scales for each item (injury types): 1:none, 2: little, 3: moderate, 4: many (much), 5: so many (much). The scale had an internal consistency (Cronbach alpha coefficient) of 0.88 for first part, 0.97 for second part, 0.98 for third part and 0.96 for fourth part. For each domain of the scale, the analysis of each part had a score ranging from 23 to 115. For first three parts; the mothers perceiving the probability higher for injury risk and having more concerns had higher scores. For fourth part; the mothers perceiving themselves negatively for self-confidence toward injury intervention had lower scores.

LOCALIZATION	SAFETY ACTIONS		SAFETY SCORE
	YES	NO	
<b>GENERAL</b> Stairs door Lock of balcony doors Balcony-guard Window-guard Carpet safety Socket safety Electric cord safety Stove safety Demolished wall safety Phone of Poison Control Centers Window-woven wire			
<b>ENTRY</b> Shoe polish/cream Locked box for repair instruments Pets safety			
<b>LIVING ROOM</b> Furniture safety Small things; metal money etc. safety Baby walker			
<b>BABY/CHILD ROOM</b> Furniture safety Toy safety Piece of clothing safety			
<b>PARENT BEDROOM</b> Furniture safety Medicine cupboard safety Iron safety Make-up material safety Firearm safety			
<b>KITCHEN</b> Gas safety Oven/stove safety Cleaning agent safety Cutting tools; knife...etc. safety Match/lighter safety Rat poison, insecticide safety Plastic bag safety			
<b>BATHROOM</b> Slide prevents Cleaning agent safety Lock for bathroom's door Straight razor/ razor blade safety			

Figure 2: Home safety evaluation form

The evaluation of maternal awareness for injury risk

In both groups, awareness level of mothers about injury risks at home were measured by a picture task showing the injury risks and hazards at home for the children (Figure 1). This picture was used first in a previous study regarding safety education in a pediatric primary care setting(11). Each item on the picture marked by mothers was given the value of 1 point and the total points the mother gets was defined as the "awareness score for injury risk." The maximum score that a participant can get from that evaluation was 18 points. The mothers in Group 1 have assessed the pictures twice, once before the training seminar and once at home visits, whereas the mothers in Group 2 have assessed them only once during home visits.

### Home safety evaluation

A home safety evaluation form, which was developed by the researchers, was used at home-safety visits in order to identify potential injury hazards in different parts of home, and safety practices of mothers that were accomplished within the period following the training programs or receiving the pamphlet (Figure 2). On this form, the injury hazards in different parts of home were evaluated by researchers, and safety scores were given in two point scales for each item: 0: unsafe, 2: safe. Since some object safeties including balcony door, balcony, stairs door, pets, baby walker or firearm did not occur in all participants' house, these items were accepted as irrelevant for some participants. The sum of these safety scores was defined as the "home safety score" for each participant. Further, the researchers have recorded the recent home safety practices of mothers that were accomplished within the period following the training intervention. For analysis, each safety action was treated as a dichotomous variable (1:yes, 0:no).

At home visits, when the hazards identified, mothers were taught how to remove or modify these hazards to mitigate the potential risks, and were given the knowledge about the appropriate safety products and practices.

### Statistical analysis:

Bivariate analyses, including *t*-tests and *chi-square* statistics were used to compare the sociodemographic characteristics and baseline injury histories between the groups at the time of enrolment. *T*-test (*t*-test for independent sample and adjusted *t*-test with unequal variance) was conducted to compare the awareness score for injury risk, home safety score and child temperament scores between the groups. The awareness score for injury risk before and after intervention in Group 1 was evaluated by using paired sample *t*-test. According to demographic characteristics of participants, the awareness score for injury risk, home safety scores and

risk perception scores were evaluated by using *t* tests (*t*-test for independent sample and adjusted *t*-test with unequal variance). The difference between the groups according to home safety practices after intervention was evaluated using *Fisher's exact test*. Pearson correlation analysis was conducted to evaluate the correlation among maternal perception score for child temperament, maternal risk perception score, awareness score for injury risk and home safety score. All statistical analyses were performed using SPSS 11.5 for Windows.

## Results

### General characteristics of the participants

Table 1 shows the characteristics of mothers and children. There were no statistical differences between two intervention groups regarding sociodemographic characteristics of participants and number of home injury histories of the children.

Table 1. Characteristics of the study population.

	Group 1 (n=47)	Group 2 (n=27)	p
<b>Maternal age (mean ± SD)</b>	30.8 ± 4.6	29.6 ± 4.6	<b>0.282*</b>
<b>Maternal educational degree [n (%)]</b>			<b>0.425**</b>
Primary school	7 (14.9)	6 (22.2)	
High school and university	40 (85.1)	21 (77.8)	
<b>Maternal employment states [n (%)]</b>			<b>0.434**</b>
Housewife	27 (57.4)	18 (66.7)	
Employed	20 (42.6)	9 (33.3)	
<b>Paternal age (mean ± SD)</b>	33.8 ± 4.5	32.5 ± 6.9	<b>0.327*</b>
<b>Paternal educational degree [n (%)]</b>			<b>0.178**</b>
Primary school	5 (10.6)	6 (22.2)	
High school and university	42 (89.4)	21 (77.8)	
<b>Paternal employment status [n (%)]</b>			
Employed	46 (97.9)	27 (100.0)	
Not employed	1 (2.1)	0	
<b>Child age (mean ± SD) (months)</b>	14.7 ± 10.1	20.5 ± 18.8	<b>0.052*</b>
<b>Child gender [n (%)]</b>			<b>0.281**</b>
Boy	20 (42.6)	15 (55.6)	
Girl	27 (57.4)	12 (44.4)	
<b>Number of living child [n (%)]</b>			<b>0.109**</b>
1	34 (72.3)	14 (51.9)	
2-3	13 (27.7)	13 (48.1)	
<b>Number of the children who experienced at least one home injury [n (%)]</b>			<b>0.171**</b>
Present	19 (40.4)	15 (55.6)	
Absent	28 (59.6)	12 (44.4)	
<b>Number of experienced home injuries of the children (mean ± SD)</b>	1.54 ± 0.69	1.27 ± 0.45	<b>0.222*</b>
<b>Child temperament score (mean ± SD)</b>	43.3 ± 9.2	43.1 ± 8.4	<b>0.925*</b>

\**t* test

\*\**Chi-square*

**Table 2.** The evaluation of characteristics of the participants and maternal risk perception scores.

	Subscales of maternal risk perception			
	Injury possibility	Injury seriousness	Concern	Self-confidence
Maternal age (mean $\pm$ SD)				
21-30 (n=40)	42.9 $\pm$ 10.6	93.6 $\pm$ 17.9	79.1 $\pm$ 28.0	81.8 $\pm$ 19.6
31-44 (n=34)	41.8 $\pm$ 12.3	90.6 $\pm$ 25.9	71.0 $\pm$ 26.5	79.1 $\pm$ 19.5
$\rho^*$	0.679*	0.551*	0.213*	0.559*
Maternal educational degree				
Primary school (n=13)	37.1 $\pm$ 11.9	77.8 $\pm$ 35.6	71.2 $\pm$ 31.1	73.8 $\pm$ 28.8
High school and university (n=61)	43.5 $\pm$ 11.0	95.2 $\pm$ 16.5	76.3 $\pm$ 26.8	82.0 $\pm$ 16.9
$\rho^*$	0.613*	0.108**	0.340*	0.338**
Maternal employment states				
Housewife (n=45)	41.7 $\pm$ 11.8	86.7 $\pm$ 27.3	75.5 $\pm$ 27.9	77.1 $\pm$ 21.4
Employed (n=29)	40.1 $\pm$ 10.05	96.5 $\pm$ 19.1	74.9 $\pm$ 27.1	85.2 $\pm$ 17.2
$\rho^*$	0.185*	0.159**	0.909*	0.101*
Child gender [n (%)]				
Boy (n=35)	42.5 $\pm$ 12.6	88.4 $\pm$ 23.5	77.8 $\pm$ 26.8	83.0 $\pm$ 19.0
Girl (n=39)	42.2 $\pm$ 10.3	95.6 $\pm$ 19.9	73.2 $\pm$ 28.2	78.4 $\pm$ 19.9
$\rho^*$	0.916*	0.159*	0.478*	0.313*
Number of siblings				
0 (n=48)	42.8 $\pm$ 11.2	95.1 $\pm$ 17.9	75.3 $\pm$ 27.5	82.4 $\pm$ 18.3
1 (n=26)	41.7 $\pm$ 11.8	86.7 $\pm$ 27.3	75.5 $\pm$ 27.9	77.1 $\pm$ 21.4
$\rho^*$	0.695*	0.165**	0.973*	0.265*
Injury history				
Present (n=34)	41.9 $\pm$ 10.9	88.1 $\pm$ 26.6	71.2 $\pm$ 29.9	84.1 $\pm$ 21.4
Absent (n=40)	42.8 $\pm$ 11.8	95.7 $\pm$ 16.3	78.9 $\pm$ 24.9	77.6 $\pm$ 17.4
$\rho^*$	0.739*	0.154**	0.226*	0.153*
Study groups				
Group 1 (n=47)	40.8 $\pm$ 10.0	98.1 $\pm$ 15.6	73.3 $\pm$ 27.2	79.7 $\pm$ 17.9
Group 2 (n=27)	45.1 $\pm$ 13.1	81.9 $\pm$ 27.2	79.1 $\pm$ 27.9	82.0 $\pm$ 22.2
$\rho^*$	0.159**	0.006**	0.381*	0.626*

\*T-test for independent sample

\*\*Adjusted t- test with unequal variance.

### The evaluation of maternal perception score for child temperament

As shown in Table 1, maternal perception score for child temperament were found similar in groups. In the correlation analysis, this score was not correlated with maternal risk perception score, the awareness score for injury risk and home safety score.

### The evaluation of maternal risk perception

Table 2 shows the evaluation of characteristics of the participants and risk perception scores. There were no statistical differences in maternal risk perception scores according to the

characteristics of participants including age, education status, employment status, child gender, number of siblings and number of home injury histories of the children.

Evaluating the groups according to maternal risk perception scores, the perception score of injury seriousness (second part) was significantly higher in the mothers of Group 1 than those of Group 2 ( $p=0.006$ ) (Table 2). The mothers in Group 1 were more inclined to perceive child home injuries as more seriously.

In the correlation analysis, the perception score of injury seriousness (second part) was found positive correlated

with post-intervention awareness score for injury risk, which was measured from the marks of the picture at home visits by the participants ( $r=0.356$ ,  $p=0.020$ ). However, maternal risk perception score was not correlated with home safety score, awareness score for injury risk before intervention and child temperament score.

### The evaluation of the awareness score for injury risk

Table 3 shows the awareness scores and home safety scores of the participants according to their characteristics. The level of the awareness score for injury risk before intervention was found higher in the mothers who graduated

Table 3. The evaluation of characteristics of the participants and maternal scores of the study.

p>	The awareness score for injury risk before intervention	The awareness score for injury risk after intervention	Home safety score for whole house
Maternal age (mean ± SD)			
21-30 (n=40)	10.7 ± 3.2	10.8 ± 2.7	59.4 ± 7.8
31-44 (n=34)	10.7 ± 2.0	11.5 ± 3.2	59.1 ± 8.2
P*	0.969*	0.275*	0.889*
Maternal educational degree			
Primary school (n=13)	8.9 ± 4.1	9.2 ± 3.9	57.9 ± 9.2
High school and university (n=61)	11.1 ± 2.2	11.5 ± 2.6	59.5 ± 7.7
P*	0.042*	0.061**	0.532*
Maternal employment states			
Housewife (n=45)	10.7 ± 2.9	10.9 ± 2.8	59.5 ± 7.7
Employed (n=29)	10.8 ± 2.3	11.5 ± 3.1	58.8 ± 8.4
P*	0.953*	0.400*	0.689*
Child gender [n (%)]			
Boy (n=35)	10.6 ± 3.2	10.9 ± 3.2	58.5 ± 7.9
Girl (n=39)	10.9 ± 2.2	11.3 ± 2.7	59.9 ± 7.9
P*	0.703*	0.517*	0.455*
Number of siblings			
0 (n=48)	11.0 ± 2.2	11.5 ± 2.6	60.3 ± 6.5
1 (n=26)	9.9 ± 3.5	10.5 ± 3.5	57.3 ± 9.9
P*	0.203*	0.183*	0.181**
Injury history			
Present (n=34)	10.1 ± 3.3	10.3 ± 3.3	60.1 ± 6.2
Absent (n=40)	11.2 ± 2.0	11.2 ± 2.0	58.5 ± 9.2
P*	0.154*	0.020*	0.408*

\*T-test for independent sample

\*\*Adjusted t- test with unequal variance.

Table 4. Statistically significant home safety practices of mothers between the groups.

	GROUP 1 (n=47)	GROUP 2 (n=27)	P*
	n (%)	n (%)	
Furniture in the living room	31 (66)	7 (26)	0.001
Small things like metal money	29 (62)	5 (19)	0.001
Balcony door	11 (23)	0 (0)	0.021
Carpet safety	13 (28)	1 (4)	0.013
Electric socket	17 (36)	1 (4)	0.002
Cleaning agent safety in bathroom	21 (45)	2 (7)	0.001
Straight razor/ razor blade safety	15 (32)	0 (0)	0.001
Oven/stove safety	24 (51)	2 (7)	<0.001
Cleaning agent safety in kitchen	20 (43)	2 (7)	0.004
Plastic bag safety	17 (36)	3 (11)	0.029
Toy safety	28 (60)	6 (22)	0.005
Piece of child clothing safety	22 (47)	2 (7)	0.001

\*Fisher's exact test

high school or university than those graduated primary school ( $p=0.042$ ). The mothers whose child had no home injury histories had higher level of the awareness score for injury risk than those whose children had at least one injury experience ( $p=0.020$ ). In the correlation analysis, these scores were not correlated with child temperament score and home safety score.

Evaluating the items marked in the picture by the mothers, the awareness score for injury risk of the mothers was  $10.7 \pm 2.6$  before the intervention and  $12.0 \pm 2.8$  at home visits in Group 1 ( $p < 0.001$ ). Namely, this score increased after the intervention in this group. The awareness for injury risk evaluation before intervention was not conducted for the mothers of Group 2. The score of the mothers in Group 2 after intervention was  $9.5 \pm 2.8$  at home visits, and significantly lower than the score of Group 1 ( $p < 0.001$ ).

#### The evaluation of home safety score

As shown in Table 3, there was no statistically significant difference in home safety scores according to the characteristics of participants including age, education status, employment status, child gender, number of siblings and number of home injury histories of the children.

Total home safety scores was found  $60.5 \pm 5.7$  and  $56.9 \pm 10.5$  in Group 1 and Group 2, respectively ( $p=0.040$ ). The houses of Group 1 were safer than those of Group 2. The finding, which indicated that safety scores in the bathrooms of Group 1 was higher than those of Group 2 mainly has led to this statistical difference ( $p=0.017$ ). In correlation analysis, there were no correlations among home safety scores, the awareness scores for injury risk and maternal perception of child temperament score.

#### The evaluation of post-intervention home safety practices

The percent of the mothers reported that they have made at least one safety

practices in their home after the training or receiving pamphlet was 28% and 8% respectively, in Group 1 and Group 2 ( $p < 0.001$ ). The rates of twelve home safety practices of mothers accomplished after intervention was found statistically significant between the groups (Table 4).

## Discussion

Present study highlights maternal training programs and their influence on maternal awareness about injury risk and home safety behaviors. As an important point, a post-intervention home visit program was used in order to score home injury safety and to identify home injury practices accomplished by mothers.

Parent-directed interventions including home-safety education within the clinical setting offer a potentially efficacious route for the promotion of safety behaviors(12). We conducted this study with the aims of evaluating the impacts of two different maternal training programs on injury prevention, and also to decide the most feasible maternal training program for well-child visits. Recent data reveal that home safety education provided as one-to-one, face-to-face education in a clinical setting or at home like our training program, is effective in increasing a range of safety practices (13). However, it should be considered that some interventions such as interactive face-to-face education programs or home-based parent education programs may lead additional loads for health workers regarding adequate time, cost or experienced personal for these interventions. Therefore, while the most appropriate maternal training programs about home safety is decided, these loads for health workers and the potential benefits of the intervention should be considered.

Maternal attitudes and perceptions are an important consideration in designing successful injury interventions, and perceptions of risk may mediate relationships found between social environment and injury outcomes (14,15). We found that the mothers

receiving an interactive training program was more inclined to perceive child home injuries as more seriously than those receiving a pamphlet. This finding may be explained with increased awareness for injury risk in the mothers receiving interactive education program. We suggest that due to increasing the level of awareness for injury risk after intervention, they may perceive home injuries as more seriously.

Previous studies evaluating validation of parent self-reported home safety practices show that certain home safety practices are over-reported(16). Since we identified injury hazards with an objective evaluation at home visits for all mothers, we suggest that home visit program strengthens the findings of our study. Home visiting programs promote child health and development for a broad of range of outcomes(17). Further, implementation of home visits to safety training programs may lead an additional counseling chance for minimizing the hazards in the home. In fact, some previous studies indicate that education programs adapted home visit was effective to decrease the rate of home injuries and injury risks (18,19). We implemented home visits in order to not only identify home safety behaviors of the mothers but also to give counseling to them about injury risks in the home, the appropriate safety products and practices. Since we have refreshed the knowledge about the appropriate safety products and practices in home visits, we suggest that home visits may provide an additional positive impact to our interactive training program.

There is inconsistent evidence to indicate whether maternal educational interventions are effective in improving maternal knowledge and awareness about injury risks. Several investigators have found that educational materials increase parental safety knowledge and device use(11,12). Other results, however, have been contradictory (20). We found that awareness level for injury risk, which was identified in the evaluation of the picture, increased after intervention for the

mothers who have participated at the interactive training program. On the other hand, in the group of mothers that were given only written material, the awareness score after intervention was found lower than that of other group. These findings suggest that maternal interactive education programs about home injury in clinical settings might be more effective on the level of maternal awareness for injury risk than giving a written material.

Parental knowledge and behaviors on injury prevention may be correlated with safety prevention practice.<sup>6</sup> However, there is contradictory evidence to indicate whether parental home safety education is effective in actual home safety behaviors and the decrease in the risk of injuries. In a previous study, the intervention group receiving a home safety education demonstrated a significantly higher average overall safety score at follow-up with telephone interviewing than the control group in a previous study.<sup>21</sup> Babul et al. (2007) show that only two of the 14 parental safety behaviors showed a significant increase in use among parents in the intervention groups (safety kit and safety kit plus home visit); suggesting that the intervention was minimally effective at changing parental safety behaviors.<sup>7</sup> A recent review indicate that home safety education is effective in increasing a range of safety practices, such as safe storage of medicines, safe hot water temperatures and fitted stair gates.<sup>13</sup> In our study, of the mothers received an interactive training program, home safety score was found higher than that of the mothers received only a pamphlet. Especially, bathroom was found more safely for injury risk in the interactive training group. Further, as another important finding, at home visits it was found that the mothers of training group were more inclined to improve the injury hazards in their home. These findings suggest that the interactive face-to-face training program with few participants had a positive effect on maternal home safety behaviors and improving the injury hazards.

Several limitations to this study should be recognized. First, we assessed the effectiveness of maternal training with home safety score, but we didn't identify post-intervention injury histories of the children. Second, we didn't evaluate long-term effects of home safety education on maternal home safety behaviors.

In conclusion; an important strength of this study was that the findings have implications for interventions to increase maternal home-safety practices in well-child visits. Our results

suggest that although the focused, interactive home safety education in well-child clinic may bring additional loads to health personals, it was an effective intervention for improving maternal awareness and home safety practices for the prevention of childhood injuries. Increasing maternal awareness for their children's risk to injury may be a valuable tool to improve safety behaviors. Home visit as an education program may provide an additional positive impact to interactive training program and may lead improvement the injury hazards

in the home. Future research are needed to evaluate long term impacts of home safety education on the occurrence of injury and home safety behaviors, and also to assess the effects of repeated home visit programs on parental behavior change and risk perception levels.

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