

# The Effects of Two Educational Strategies on Knowledge, Attitude, Concerns, and Practices of Mothers With Febrile Convulsive Children

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## Abstract

**Background:** Febrile seizures are common during childhood and have a good prognosis, although they cause fear and anxiety in parents. Parent education is an important intervention in febrile seizures.

**Objectives:** The aim of this study was to compare the effects of two educational strategies, written information vs. written information plus verbal instruction on knowledge, attitudes, concerns, and practices of mothers with febrile convulsive children.

**Patients and Methods:** The study adopts a quasi-experimental research design. A total of 102 mothers of children presenting with febrile seizure and admitted to a teaching hospital in Iran were equally assigned to three groups: Group I received no intervention (control group), Group II received a febrile seizure information pamphlet, and Group III received the febrile seizure information pamphlet plus verbal instruction. Knowledge, attitudes, concerns, and practices of participants regarding febrile seizure were measured as primary outcomes in the pre- and post- intervention stages.

**Results:** The results showed that although only a slight change in attitudes toward febrile seizures was found, both the febrile seizure information pamphlet alone and the febrile seizure information pamphlet plus verbal instruction were significantly effective in improving the knowledge, attitudes, concerns, and practices of mothers with febrile convulsive children toward febrile seizures.

**Conclusions:** This study suggests that written materials in the form of a pamphlet can be an effective teaching strategy for educating parents on febrile seizures. However, written and verbal information should be given together where possible.

**Keywords:** Febrile Seizures, Health Knowledge, Attitudes, Practice, Parent Education, Fever

## 1. Background

Febrile seizure or febrile convulsion is “a seizure in association with a febrile illness, in the absence of a central nervous system infection or acute electrolyte imbalance in children older than 1 month of age without prior afebrile seizures” (1). Febrile seizure is common in young children, occurs in 3% - 4% of children below six years of age (2), and is one of the common causes of pediatric hospital admissions (3). The recurrence possibility of febrile seizure is 30% (4). The long-term outcomes for children with febrile seizure are similar to those for control children from the perspectives of school performance, behavior, and late use of health care resources (5).

Although the occurrence of febrile seizures in childhood is quite common and is generally considered to be a benign condition with a good prognosis (6, 7), it can be extremely frightening, emotionally traumatic, and anxiety

provoking when witnessed by parents (8).

When parents witness their child's first febrile convulsion, they are understandably shocked and in many cases think that the child may die (9, 10). The occurrence of febrile seizures can potentially disrupt the family's quality of life and the parents may experience anxiety and fear whenever a child develops a fever (8). Mothers tend to become more involved in seizure-related issues (11).

Parental anxiety and apprehension are related to inadequate knowledge of fever and febrile seizure (5, 12). Parents may lack the knowledge or preparedness to offer first aid to a child who is having a seizure (13, 14). Researchers emphasize that necessary measures should be taken to educate parents regarding febrile convulsion (10, 14).

Huang et al. found many common misconceptions in Taiwan regarding first-aid practices for febrile seizure, For example, it is appropriate to shake or attempt to wake the

child while he or she is convulsing or to pull the child's mouth during the seizure (15). Jarrett et al. found that pre-hospital management of febrile seizures in Iband, Nigeria, comprises mainly harmful traditional practices, and that there is a need for appropriate health education to reduce the morbidity and mortality associated with febrile seizures in the area (16).

The prevention of complications can be assisted by education (17). Based on the literature, parent education and emotional support are important interventions (18-20). In fact, parents need more treatment than their febrile convulsive children. The best treatment for febrile seizure is not necessarily to prescribe medications but rather to sit with the family and talk (21).

Parents need reassurance regarding the benign nature of febrile seizures (20). They should be counseled about the relative risks of recurrence of febrile seizures and recurrence of epilepsy, be educated on how to handle a seizure acutely, and be given emotional support (22).

Giving information can improve parental knowledge, and knowledge empowers parents. Well-informed parents manage febrile seizures better when they occur. Better understanding may help the parent cope better with the frightening experience of watching their child convulse. Knowledge may also help to reduce anxiety (23).

A review of the literature identified some studies that evaluated the effectiveness of educational programs on parents with febrile convulsive children (18, 21, 24). Huang et al. assessed the effectiveness of a two-hour educational program plus a febrile convulsion information pamphlet on parents of children who had experienced a febrile convulsion three months ago (21). In another study, Najimi et al. assessed the effects of three educational sessions on knowledge, attitudes, and practices of mothers regarding prevention of febrile seizure in children. They found that the educational program was effective in improving participants' knowledge, attitudes, and practices regarding prevention of febrile seizures (24).

These studies required the presence of a parent in training program after discharge from the hospital. This may be difficult in terms of practical implementation. Teaching parents during their presence in the hospital, when the motivation to learn is high, is perhaps administratively easier, less costly, and more effective.

Besides, recently, Iran's ministry of health accreditation programs have required hospitals to prepare patient education materials such as pamphlets with at least five of the most common causes of hospital admission in each specialty area. These materials are to be used by pediatric patients' caregivers, and they should be made available to them (25). However, the effectiveness of such pamphlets has not been assessed. A recent systematic review

suggested that more studies are required to investigate the effectiveness of educational strategies in improving parental outcome measures for providing effective care for their febrile child (26). Although parental education for febrile seizures and the use of verbal and written information during communication of care issues with patients and/or significant others have been emphasized, few studies have compared the effects of written information only and written information with verbal explanation during hospital stay of parents with febrile convulsive children (5, 10, 27-30).

## 2. Objectives

The objective of this study is to compare the effects of distributing a febrile seizure information pamphlet and distributing a febrile seizure information pamphlet plus verbal instruction on knowledge, attitudes, concerns, and practice of mothers with febrile convulsive children.

## 3. Patients and Methods

### 3.1. Design, Setting and Participants

#### 3.1.1. Design

This study used a quasi-experimental pretest and posttest design with two comparison interventions with an allocation ratio of 1:1 and a routine intervention "usual treatment" group as a comparison group to test the effects of interventions.

#### 3.1.2. Setting

The setting of this study was Tabriz Children's hospital in Iran, the largest children medical centre in the north-west area of Iran. This hospital is a 200-bed acute care university hospital providing tertiary referral care for critically ill patients (31).

#### 3.1.3. Participants

The participants consisted of a convenience sample of 102 consecutive mothers whose children had been diagnosed with febrile seizure and admitted to the pediatric ward in the children's hospital between February 2010 and September 2012. The mothers were placed in three groups: Group I received no intervention (control), Group II received a febrile seizure information pamphlet, and Group III received the febrile seizure information pamphlet plus verbal instruction.

### 3.1.4. Inclusion and Exclusion Criteria

The participants were able to read and write in Persian, and their children were not reported to have any other medical condition except febrile seizure; they witnessed their children's seizure and stayed with them during hospitalization.

### 3.2. Sampling and Sample Size

A convenience (consecutive) sampling approach was used. In order to reduce the possibility of contamination bias (sharing of information between study groups), the first 34 mothers served as the control group (usual care), the next 34 mothers as group II (pamphlet), and the last 34 mothers as group III (pamphlet plus verbal instruction). In order to determine the sample size in this study and to calculate effect size, the primary information including mean and standard deviation of concern variable was derived from Huang et al.'s study (21). Considering a two-sided 5% significance level and a power of 80%, a sample size of 24 participants per group was necessary. Taking an anticipated dropout rate of 30% into consideration, the sample size was increased to at least 31 participants in each group. Thirty-four participants in each group were selected.

### 3.3. Outcome Measures

The primary outcome was measuring knowledge, attitudes, concerns, and practices regarding febrile seizure using the knowledge, attitudes, concerns and Practices (KACP) questionnaire.

The KACP questionnaire was developed by Huang et al. (32) and consisted of five sections as follows:

1. Family characteristics and parental beliefs about the causes of febrile seizures. In our study, some questions about participants' demographic characteristics such as age, education, job, and number of children; febrile convulsive child's age, gender, and frequency of febrile seizures; parents' history of febrile seizure; and siblings' history of febrile seizure were included in the first section of the questionnaire.

2. Knowledge: Knowledge is defined as parental knowledge regarding febrile seizures, including possible causes of febrile seizure, necessary medical evaluation, and risk of febrile seizure recurrence or developing subsequent epilepsy, necessity of anticonvulsants, and recommended/non-recommended practices for seizures. This domain consisted of 11 true/false questions with a "Don't know" category provided for each. Correct answers received 1 point; incorrect and "don't know" answers received no score (zero points).

3. Attitudes: Attitudes are defined as parental opinions regarding febrile convulsions treatment, prognosis,

examination, daily care, and relevant socio-cultural perspectives. Ten 5-point Likert-scaled items formed this domain, with "5" indicating the most positive end of the scale. "Not applicable" responses were not counted.

4. Concerns: Concerns are defined as parental concerns about treatment, recurrence, and consequences of febrile convulsions. Ten 5-point Likert-scaled items with a "not applicable" response choice formed this domain. A score of "5" indicated the greatest concern. When "not applicable" was chosen, the response was not counted (21, 32, 33).

5. Practices: Practices are defined as parental management of children's seizures. There were 15 "yes/no" items given, covering recommended and non-recommended practices. Checking "yes" indicated that parents used the practice to deal with a child who was having a seizure (15, 21, 32). Mothers were asked about two kinds of practices, which included responses to their child's febrile seizure and anticipated practice for recurrent febrile seizure in the future.

The reliability of internal consistency was tested by computing Cronbach's coefficient alpha, and KR20 for the KAC domains for southern Taiwanese were reported as the following values: knowledge, 0.72 (KR20); attitudes, 0.75; and concerns, 0.88 (32). Kayserili et al. used the KACP scale in their study in Turkey, but they did not report its reliability (29).

Cronbach's alpha values obtained in our study were as follows: knowledge, 0.67; attitudes, 0.81; concerns, 0.84; and practice, 0.81.

The Persian translation of the KACP questionnaire was carried out in a forward-backward translation procedure. The contents of the questionnaire were validated by experts from the nursing and medical field of pediatrics.

### 3.4. Study Interventions

#### 3.4.1. Development of Febrile Seizure Information Pamphlet

After a review of the literature on febrile seizure and effective patient teaching strategies, a febrile seizure information pamphlet was developed. This pamphlet discussed the typical parental thoughts and reactions to febrile seizures and the benign nature of febrile seizure in general, a description of a typical attack, the etiology of seizures, the prevalence of febrile seizure, the risk of seizure recurrence, the risk of developing epilepsy, the risk of brain damage due to febrile seizures, and the recommended and non-recommended first-aid measures for fever and seizure. In a previous study, Huang et al. developed a pamphlet that discussed the topics mentioned in our study pamphlet plus necessary medical evaluations and prophylactic medicines and their potential side ef-

fects (21). Our study pamphlet did not include the topics mentioned in this pamphlet because of some patient-based differences existing among patients in certain aspects. We tested this pamphlet with 12 parents of children with febrile seizures and adjusted it to improve its comprehension.

#### 3.4.2. Recruitment and Procedure

The researchers gave the KACP questionnaires and the febrile seizure pamphlet to the head nurse of the ward at the children's hospital, and the head nurse and some ward nurses agreed to select mothers and collect data. They received verbal instruction regarding each step of the recruitment and regarding data collection procedures. This involved informing eligible mothers about the purpose of the study, explaining the data collection procedures, and explaining the contents of the pamphlet.

Participants in Group I (control), provided they met the inclusion criteria, received verbal explanation about the study from the head nurse or ward nurse after their child's admission into the ward and at an appropriate time for completing the informed consent forms and answering the questionnaire. Participants who agreed to take part in the study received a consent form and signed it. Then, they completed the study questionnaire. After completion, they returned it in an envelope. Then, prior to discharge, participants completed the study questionnaire again. Participants in Group II (pamphlet), after completing the questionnaire in the pretest, received the febrile seizure pamphlet and, like Group I, completed the study questionnaire prior to discharge. Participants in Group III (pamphlet plus verbal instruction), after receiving the febrile seizure pamphlet, received verbal instructions about its contents; any questions about the content were answered. Then, same as th Group I and II, they completed the questionnaire prior to discharge. The duration between pretest and posttest was equal for all three groups ( $P = 0.149$ ). As part of ward routine, all participants received the usual verbal advice from the staff before discharge.

#### 3.5. Ethical Considerations

This study was reviewed for ethical considerations and approved by members of the pediatric health research center of the Tabriz University of Medical Sciences (No. 89 - 94) and the ethics committee of the Tabriz University of Medical Sciences (No. 5.4.7849, Date: December 29, 2010). All participants completed informed consent forms before the study began. They were informed that the goal of the study was to examine the effects of distributing a febrile convulsion information pamphlet on knowledge, attitudes, concerns, and first-aid measures among mothers with febrile convulsive children, that they could

stop participating whenever they wanted, and that they would not suffer any disadvantages if they stopped. They completed anonymous questionnaires, so that individuals could not be identified. To ensure confidentiality, the questionnaires were returned in envelopes.

#### 3.6. Data Analysis

All statistical analyses were performed using SPSS for Windows (version 13.0, SPSS Inc., Chicago, IL, USA). The Kolmogorov-Smirnov test was used to assess normality of data.

Data were presented using mean (SD) for normal quantitative variables, using median (min-max) for non-normal quantitative variables, and frequency (percentage) for qualitative variables. Data that were normally distributed were analyzed using parametric tests, (i.e., analysis of variance (ANOVA)). Chi-square tests were used for categorical data. Demographic characteristics of the groups were compared using ANOVA, Kruskal Wallis test, and  $X^2$  analysis, as appropriate. The Kruskal Wallis test, with the Bonferroni correction, was used to compare the effects of educational interventions (none, febrile seizure pamphlet, febrile seizure pamphlet plus verbal instruction) that participants received on their scores, attitudes, and concerns about febrile seizure based on the KACP questionnaire. Additionally, in order to examine the effects of two interventions on mother's knowledge and practice related to febrile seizure, binary logistic regression was used. All tests were 2-sided, and the level of significance was set at 0.05.

## 4. Results

#### 4.1. Mother- and Child-Related Characteristics

Table 1 summarizes the demographic data of mothers in the pamphlet, pamphlet plus verbal instruction, and control groups. No statistically significant difference was found among the three groups in the baseline parameters ( $P > 0.05$ ).

#### 4.2. Mothers' Knowledge, Attitude, Concerns, and Practices Regarding Febrile Seizures

##### 4.2.1. Knowledge

Table 2 summarizes the mothers' scores on knowledge in the three groups. To examine the effects of two interventions on mothers' knowledge related to febrile seizure, binary logistic regression was used. The knowledge of pretest and the type of intervention were chosen as the covariates. The pamphlet and the pamphlet plus verbal instruction group demonstrated significant improvement in knowledge. The pamphlet group showed a significant increase in correct response for seven out of eleven

**Table 1.** Mothers and Child-Related Characteristics in Pamphlet, Pamphlet Plus Verbal Instruction, and Control Groups (N = 102)<sup>a</sup>

Variables	Control (N = 34)	Pamphlet (N = 34)	Pamphlet + Verbal Instruction (N = 34)	P Value
<b>Mothers' characteristics</b>				
Age mean (SD), y	26 (5)	27 (5)	27 (5)	0.667 <sup>b</sup>
Education, y	12 (9 to 12)	12 (9 to 12)		0.452 <sup>c</sup>
Job				0.100 <sup>d</sup>
Housewives	28 (87.5)	28 (82.4)	12 (9 to 12)	
Employed	4 (12.5)	6 (17.6)	22 (66.7)	
Number of children				0.418 <sup>d</sup>
1	22 (64.7)	18 (52.9)	23 (67.6)	
2 or more	12 (35.3)	16 (47.1)	11 (32.4)	
Length of stay mean (SD), d	2.27 (1.28)	3.09 (1.63)	2.31 (1.03)	0.149 <sup>c</sup>
<b>Child-related characteristics</b>				
Age mean (SD), mo	14 (10 to 18)	17 (12 to 21)	16 (12 to 20)	0.398 <sup>c</sup>
Gender	16 (48.5)	21 (61.8)	18 (54.5)	0.550 <sup>d</sup>
Male	17 (51.5)	13 (38.2)	15 (45.5)	
Female				
Frequency of Febrile seizure	31 (91.2)	29 (87.9)	29 (87.9)	0.854 <sup>d</sup>
1				
2 or more	3 (8.8)	4 (12.1)	4 (12.1)	
Parent history of Febrile seizure	2 (6.3)	3 (9.7)	8 (25.8)	0.053 <sup>d</sup>
Yes				
No	30 (93.8)	28 (90.3)	23 (74.2)	
Siblings' history of Febrile seizure	2 (6.7)	2 (7.4)	2 (8.7)	1
Yes	27 (90.0)	24 (88.9)	21 (91.3)	
No				

<sup>a</sup>Data are presented as No. (%) and median (interquartile range/IQR).

<sup>b</sup>Based on one-way ANOVA.

<sup>c</sup>Based on Kruskal Wallis test.

<sup>d</sup>Based on Chi-square test.

of the knowledge-oriented questions: for example, febrile seizure is a form of epilepsy (OR = 5.70, 95% CI = 1.60 to 20.33), risk of subsequent epilepsy in febrile convulsive children is rare (OR = 9.35, 95% CI = 2.33 to 37.53), and it is necessary to put protective devices into the mouth to prevent tongue injury during seizure (OR = 13.44, 95% CI = 2.72 to 66.48). The pamphlet plus verbal instruction group showed a significant increase in correct responses for six out of eleven of the knowledge-oriented questions: for example, risk of subsequent epilepsy in febrile convulsive children is rare (OR = 7.25, 95% CI = 1.82 to 28.89), and it is necessary to put protective devices into the mouth to prevent tongue injury during seizure (OR = 9.81, 95% CI = 1.95 to 49.42).

#### 4.2.2. Attitudes

On mothers' attitude toward febrile convulsion, low pretest scores were found in all three groups (Table 3). Most mothers believed that parents should take their children's temperature, that a febrile seizure episode is a life-threatening event, that it can cause brain damage, that it can be outgrown, and that more attention and care are needed for febrile convulsive children. However, mothers were not ashamed of having a child with febrile seizure, and few of them believed that febrile seizure was due to possession by devils. Based on the Kruskal Wallis test, significant improvement was found in selecting the two items of "A febrile seizure episode is a life-threatening event (P = 0.009)" and "Febrile seizure can cause brain

**Table 2.** Comparison of Interventions' Effects on Mothers' Febrile Seizure Knowledge in Pamphlet, Pamphlet Plus Verbal Instruction, and Control Groups (N = 34)

Knowledge-Oriented Questions	Correct Answer	Pamphlet			Pamphlet + Verbal <sup>a</sup>			P <sup>b</sup>
		OR	95% CI	P	OR	95% CI	P	
1. Febrile seizure is a form of epilepsy.	False	5.7	1.60 to 20.33	0.007	3.28	0.93 to 11.61	0.065	0.026
2. Anticonvulsant drugs are required for every FS child.	False	1.2	0.40 to 3.60	0.74	0.91	0.29 to 2.82	0.871	0.879
3. Every FS child will have another FS.	False	2.71	0.77 to 9.57	0.12	1.27	0.35 to 4.57	0.712	0.26
4. FS is rare after the age of 5 years.	True	3.2	1.05 to 9.84	0.042	4.05	1.28 to 12.82	0.017	0.041
5. Recurrence FS will cause brain damage.	False	2.77	0.58 to 13.09	0.199	4.99	1.11 to 22.40	0.036	0.107
6. Risk of subsequent epilepsy in FS children is rare.	False	9.35	2.33 to 37.53	0.002	7.25	1.82 to 28.89	0.005	0.005
7. It is necessary to put protective devices into the mouth to prevent tongue injury during convulsion.	False	13.44	2.72 to 66.48	0.001	9.81	1.95 to 49.42	0.006	0.006
8. It is necessary to restrain the child to stop the seizure during convulsion.	False	5.14	1.45 to 18.17	0.011	5.39	1.49 to 19.56	0.01	0.016
9. It is necessary to do mouth-to-mouth resuscitation during convulsion.	False	3.31	1.03 to 10.60	0.044	3.75	1.15 to 12.29	0.029	0.059
10. Children with febrile seizures will not have normal school achievement	False	3.7	1.13 to 12.13	0.031	2.17	0.67 to 7.01	0.195	0.094
11. EEG or CT is necessary for every FS child.	False	3.33	0.88 to 12.59	0.076	3.47	0.95 to 12.63	0.059	0.133

Abbreviations: CI, Confidence interval; CT, Computed tomography; EEG, Electroencephalogram; FS, Febrile seizure; OR, Odds ratio.

<sup>a</sup>Verbal Instruction.

<sup>b</sup>Based on binary logistic regression: Comparison of intervention effects on mothers' knowledge of febrile seizure using pretest knowledge and groups as covariates with control group chosen as reference group.

damage ( $P = 0.031$ )" in the pamphlet group as compared with that of the control group and pamphlet plus verbal instruction group.

#### 4.2.3. Concerns

Table 4 summarizes the participants' concerns regarding febrile seizure. According to the data, the pretest scores were high in the three groups. Particularly high concern was expressed for the fact that seizure at night causes high temperatures and potential brain damage. Based on the Kruskal Wallis test, there was no significant difference among the three groups in pretest concern-oriented question scores, but statistical differences were found in posttest in the pamphlet group as compared with that of the control group and pamphlet with verbal explanation group with regard to potential brain damage ( $P = 0.011$ ), subsequent epilepsy ( $P = 0.045$ ), inability to recognize the seizure episode earlier ( $P = 0.004$ ), further seizure episode ( $P = 0.001$ ), unawareness of managing a febrile seizure episode ( $P = 0.003$ ), and delayed treatment during the next febrile seizure episode ( $P = 0.003$ ).

#### 4.2.4. Practices

Table 5 summarizes the mothers' scores on practice about febrile seizure in three groups. To examine the effects of interventions on mothers' practice for future

febrile seizure in their children, binary logistic regression was used. The practices in the pretest and the type of intervention (group) were chosen as the covariates. Both the pamphlet group and pamphlet plus verbal instruction group demonstrated significant improvement in participants' practices. Both groups showed a significant statistical increase in the number of mothers who would implement three out of five recommended measures during another febrile seizure, for example, laying the child on his or her side in the pamphlet group (OR = 13.22, 95% CI = 2.53 to 68.95), and in the pamphlet plus verbal explanation group (OR = 35.06, 95% CI = 3.25 to 377.82). Of the ten practices considered to be not recommended in the event of a febrile seizure, there was a significant statistical decrease in intention to implement six of these measures after both interventions, for example (in the pamphlet group) rushing the child to doctors without first aid (OR = 16.32, 95% CI = 3.13 to 84.99), and in pamphlet plus verbal instruction, trying to prize the seizing child's clenched teeth apart and putting things into his or her mouth (OR = 18.96, 95% CI = 3.59 to 100.11).

## 5. Discussion

The results demonstrated that both the febrile seizure information pamphlet alone and the febrile seizure in-

**Table 3.** Median Scores of Attitude-Oriented Questions in Pre- and Posttest in Control, Pamphlet, and Pamphlet Plus Verbal Instruction Groups

Attitude-Oriented Questions	G-I Control (N = 34)		G-II Pamphlet (N = 34)		G-III Pamphlet + Verbal <sup>a</sup>		p <sup>b</sup>	Post Hoc Test (Bonferroni) p <sup>c</sup>
	Med (Min - Max)	Mean Rank	Med (Min - Max)	Mean Rank	Med (Min - Max)	Mean Rank		
<b>1. FS is due to possession by devils.</b>								
Pretest	5 (2 to 5)	38.22	5 (1 to 5)	41.7	5 (2 to 5)	40.02	0.755	-
Posttest	5 (2 to 5)	41.03	5 (1 to 5)	42.39	5 (2 to 5)	47.25	0.305	-
<b>2. FS will become epilepsy.</b>								
Pretest	4 (1 to 5)	34.42	4 (1 to 5)	33.13	5 (2 to 5)	40.24	0.454	-
Posttest	5 (1 to 5)	42	4 (1 to 5)	34.85	4 (1 to 5)	38.92	0.476	-
<b>3. Parents should take their children's temperature frequently</b>								
Pretest	1 (1 to 5)	50.65	1 (1 to 5)	47.08	1 (1 to 4)	50.81	0.712	-
Posttest	1 (1 to 5)	49.03	1 (1 to 5)	48.42	1 (1 to 5)	53.93	0.542	-
<b>4. A FS attack is a life-threatening event.</b>								
Pretest	1 (1 to 5)	45.88	2 (1 to 5)	46.05	2 (1 to 5)	50.95	0.682	-
Posttest	1 (1 to 4)	37.27	2.5 (1 to 5)	56.69	2 (1 to 5)	52	0.009	G-I and G-II: 0.009
<b>5. FS can cause brain damage.</b>								
Pretest	1 (1 to 5)	43.38	1 (1 to 5)	47.37	1 (1 to 5)	51.89	0.364	-
Posttest	1 (1 to 5)	39.82	2 (1 to 5)	56.89	2 (1 to 5)	50.37	0.031	G-I and G-II: 0.018
<b>6. FS can cause mental retardation</b>								
Pretest	2 (1 to 5)	46.17	2 (1 to 5)	45.7	3 (1 to 5)	50.52	0.725	-
Posttest	2 (1 to 5)	36.69	2 (1 to 5)	47.28	3 (1 to 5)	51.82	0.051	-
<b>7. FS can be outgrown.</b>								
Pretest	1 (1 to 5)	43.63	2 (1 to 5)	44.42	1 (1 to 5)	42.63	0.959	-
Posttest	1 (1 to 3)	42.15	2 (1 to 5)	50.84	2 (1 to 5)	48.02	0.371	-
<b>8. More attention and care are needed in FS children.</b>								
Pretest	1 (1 to 5)	47.94	1 (1 to 5)	48.94	1 (1 to 5)	50.12	0.912	-
Posttest	1 (1 to 3)	44.87	1 (1 to 5)	54.73	1 (1 to 5)	49.19	0.254	-
<b>9. If necessary, lumbar puncture is acceptable</b>								
Pretest	2 (1 to 5)	30.4	2 (1 to 5)	33.62	3 (1 to 5)	40	0.223	-
Posttest	3 (1 to 4)	38.67	2 (1 to 5)	34.46	2 (1 to 5)	45.64	0.18	-
<b>10. It is shameful to have an FS child.</b>								
Pretest	5 (1 to 5)	42.52	5 (1 to 5)	46.14	5 (1 to 5)	46.52	0.67	-
Posttest	5 (2 to 5)	43.45	5 (1 to 5)	45.5	5 (2 to 5)	52.18	0.162	-

Abbreviations: FS, Febrile seizure; G-I, Group I (control/no intervention); G-II, Group pamphlet; G-III, Group pamphlet plus verbal instruction.

<sup>a</sup>Verbal Instruction.<sup>b</sup>Based on Kruskal Wallis Test.<sup>c</sup>Based on Mann - Whitney U with Bonferroni Correction.

formation pamphlet plus verbal instruction were significantly effective in improving the knowledge, attitudes, concerns, and practices of mothers with febrile convulsive children compared to the method of routine verbal explanations. The findings of a review article have confirmed that providing written and verbal health information is more effective in improving knowledge and satisfaction than providing verbal information only for parents of children being discharged from the hospital (27). Similar to our study, Huang et al. studied the effects of educational programs on knowledge, attitudes, concerns, and first-aid measures among 129 parents with febrile convulsive children. After education, the experimental group showed significant improvement in knowledge, attitudes, concerns,

and anticipatory practices of febrile convulsion compared with the control group (21). Based on the study by Najimi et al., 44 parents whose children were admitted to the emergency room, participated in a three education sessions, each one lasting 60 min. Compared with the control group, the results showed a significant increase in the knowledge, attitudes, and practices in Intervention group one month after the intervention (24). In the study by Farsar and Kolahi, significant decrease was observed in the level of maternal anxiety in the intervention group. They recommended educational programs for mothers having children who suffer from febrile seizures (34). Additionally, the findings of a recent study by Taheri et al. (35) showed significant increase in the knowledge, attitudes, and prac-

**Table 4.** Kruskal-Wallis Test of Mothers' Concerns Scores Before and After the Interventions in Control, Pamphlet, and Pamphlet Plus Verbal Instruction Groups (N = 34)

Concern-Oriented Questions	G-I Control		G-II Pamphlet		G-III Pamphlet + Verbal <sup>a</sup>		p <sup>b</sup>	Post Hoc Test (Bonferroni) p <sup>c</sup>
	Med (Min - Max)	Mean Rank	Med (Min - Max)	Mean Rank	Med (Min - Max)	Mean Rank		
<b>1. Apt to develop fever.</b>								
Pretest	5 (1 to 5)	48.84	5 (1 to 5)	58.53	4 (2 to 5)	45.47	0.098	-
Posttest	5 (1 to 5)	59.13	4 (2 to 5)	47.41	4 (2 to 5)	44.41	0.068	-
<b>2. Potential brain damage.</b>								
Pretest	5 (1 to 5)	54.42	5 (1 to 5)	49.03	5 (1 to 5)	48.09	0.528	-
Posttest	5 (2 to 5)	60.12	4 (1 to 5)	43.58	4.5 (1 to 5)	45.88	0.019	G-I and G-II: 0.021
<b>3. Subsequent epilepsy.</b>								
Pretest	5 (1 to 5)	42.63	5 (1 to 5)	42.29	4 (1 to 5)	37.74	0.671	-
Posttest	5 (1 to 5)	55.91	3 (1 to 5)	40.21	4 (1 to 5)	44.52	0.045	-
<b>4. Inability to recognize the seizure episode earlier.</b>								
Pretest	5 (2 to 5)	54.93	5 (2 to 5)	44.64	4 (1 to 5)	35.24	0.159	-
Posttest	5 (1 to 5)	56.9	4 (1 to 5)	44.8	3 (1 to 5)	34.09	0.002	G-I and G-III: 0.000
<b>5. Further seizure episode.</b>								
Pretest	5 (1 to 5)	49.82	5 (2 to 5)	51.29	5 (3 to 5)	44.11	0.397	-
Posttest	5 (4 to 5)	56.84	4 (2 to 5)	41.8	4 (1 to 5)	35.32	0.001	G-I and G-III: 0.000
<b>6. FS episode is life threatening</b>								
Pretest	5 (1 to 5)	49	5 (1 to 5)	50.79	4 (1 to 5)	39.03	0.142	-
Posttest	4 (1 to 5)	54.39	3 (1 to 5)	41.24	4 (1 to 5)	44.83	0.123	-
<b>7. Unawareness of managing an FS episode.</b>								
Pretest	5 (1 to 5)	55.36	5 (1 to 5)	47.31	4.5 (2 to 5)	42.83	0.126	-
Posttest	4.5 (1 to 5)	59.21	3 (1 to 5)	41.63	3 (1 to 5)	40	0.005	G-I and G-II: 0.018; G-I and G-III: 0.015
<b>8. Delayed treatment at next FS episode.</b>								
Pretest	5 (2 to 5)	42.82	5 (2 to 5)	42.52	4 (2 to 5)	35.5	0.216	-
Posttest	5 (2 to 5)	57.48	3 (1 to 5)	40.62	3 (1 to 5)	37.47	0.004	G-I and G-II: 0.024; G-I and G-III: 0.006
<b>9. Siblings will have FS, too.</b>								
Pretest	3 (1 to 5)	33.82	3 (1 to 5)	33.88	3.5 (1 to 5)	42.52	0.255	-
Posttest	3 (1 to 5)	45.48	1 (1 to 5)	31.23	3 (1 to 5)	40.5	0.056	-
<b>10. Seizure at night.</b>								
Pretest	5 (2 to 5)	49.49	5 (1 to 5)	51.09	5 (1 to 5)	44.04	0.454	-
Posttest	5 (2 to 5)	54.46	5 (2 to 5)	43.55	5 (1 to 5)	43.57	0.087	-

Abbreviations: FS, Febrile seizure; G-I, Group I (control/no intervention); G-II, Group pamphlet; G-III, Group pamphlet plus verbal instruction.

<sup>a</sup>Verbal Instruction.<sup>b</sup>Based on Kruskal Wallis test.<sup>c</sup>Based on Mann - Whitney U with Bonferroni Correction.

tics of mothers after febrile seizure educational intervention. The results of the above-mentioned studies confirm the findings of the present study about the effectiveness of educational interventions on improving intended outcomes. However, these studies had some differences. For example, the time of intervention was months after a hospital visit for febrile seizures (15, 21). To decrease maternal anxiety, provision of information and psychosocial support was needed for parents of hospitalized children with febrile seizures during their hospital stay (36).

Regarding the issue of the effectiveness of pamphlets, our results are not in consistent with the literature. Huang et al. (15) evaluated the effects of educational interventions, a mailed pamphlet, and attendance of a 2 hours group education session, on parental practices for recur-

rent febrile convulsions. They found that parents who attended the educational program demonstrated significant improvements in recommended and non-recommended practices from initial to recurrent febrile convulsions. This is similar to our findings. They also found that parents who only received pamphlets did not show significant improvements. The findings of our study did not support this. The findings of another study showed that the provision of leaflets with written instruction to British parents did not appear to significantly improve their knowledge or reduce anxiety about febrile seizure. The authors concluded that additional strategies to inform parents may be necessary (7).

The purpose of the current study was to test the effects of distributing a febrile seizure information pam-

**Table 5.** Using Recommended and Non-Recommended Practices During Acute Seizure in Pre- and Posttests in Pamphlet, Pamphlet Plus Verbal Instruction, and Control Groups (N = 34)

	Pamphlet			Pamphlet + Verbal <sup>a</sup>			p <sup>b</sup>
	OR	95% CI	P	OR	95% CI	P	
<b>Recommended Practices</b>							
1. Lowering body temperature.	3.69	0.34 to 40.17	0.284	3.31	0.44 to 24.91	0.245	0.380
2. Laying the child down on a soft and safe surface.	3.90	1.11 to 13.72	0.034	3.86	1.05 to 14.21	0.042	0.041
3. Laying the child on his or her side.	13.22	2.53 to 68.95	0.002	35.06	3.25 to 377.82	0.003	0.001
4. Keep calm.	2.11	0.55 to 8.09	0.274	6.29	1.06 to 37.30	0.043	0.125
5. Observing seizure manifestations and duration.	7.26	1.46 to 36.14	0.015	3.31	0.79 to 13.87	0.101	0.040
<b>Non-recommended practices</b>							
6. Rushing the child to doctors without providing first aid first.	16.32	3.13 to 84.99	0.001	1.30	0.23 to 7.40	0.769	0.001
7. Shaking and the convulsing child.	2.82	0.92 to 8.69	0.071	5.32	1.65 to 17.16	0.005	0.018
8. Trying to prize the convulsing child's clenched teeth apart and putting things into the child's mouth.	7.72	1.49 to 40.04	0.015	18.96	3.59 to 100.11	0.001	0.002
9. Attempting to do mouth-to-mouth resuscitation.	4.81	1.62 to 14.27	0.005	5.82	1.89 to 17.87	0.002	0.003
10. Sucking discharge from the nose and mouth.	1.12	0.28 to 4.47	0.876	1.44	0.37 to 5.58	0.600	0.861
11. Cardiac massage.	8.73	2.65 to 28.69	0.000	5.99	1.86 to 19.29	0.003	0.001
12. Restraining the convulsing child.	4.23	1.37 to 13.07	0.012	4.12	1.24 to 13.72	0.021	0.021
13. Stimulating the convulsing child.	2.73	0.88 to 8.46	0.082	1.84	0.59 to 5.74	0.291	0.209
14. Throwing water on the child's body.	2.23	0.68 to 7.27	0.183	2.88	0.80 to 10.34	0.105	0.222
15. Pouring water into the child's mouth.	3.16	1.05 to 9.48	0.040	3.28	1.01 to 10.62	0.047	0.055

Abbreviations: CI, Confidence interval; OR, Odds ratio.

<sup>a</sup>Verbal Instruction.

<sup>b</sup>Based on binary logistic regression: Comparison of intervention effects on mothers' practices regarding febrile seizure using pretest practice and groups as covariates with control group chosen as reference group.

pamphlet alone with the febrile seizure information pamphlet plus verbal instruction on knowledge, attitudes, concerns, and practices of mothers regarding febrile convulsive children. The results showed that although only a slight change in attitudes toward febrile seizures was found, both the febrile seizure information pamphlet alone and the febrile seizure information pamphlet plus verbal instruction were significantly effective in improving the knowledge, attitudes, concerns, and practices of mothers regarding febrile convulsive children toward febrile seizures. However, written and verbal information should be given together, where possible.

The strong points of this study compared to the previous studies were that the design of the study was strengthened by adding one routine care group, and that the study interventions were feasible for implementation by health care providers. In a busy ward, it could be an easy and simple intervention to give parents a standard pamphlet and combine it with verbal explanation.

Our study had some limitations that did limit its gener-

alizability. There was the possibility of exposure of participants to other channels of communication as extraneous factors, and it was difficult to control them within clinical areas. There was no possibility of blinding in this study. Another limitation of this study was the lack of random allocation in grouping mothers. This limitation could cause a selection bias and may confound the study results. Finally, mothers were recruited from only one medical center; therefore, the findings could be generalizable only to settings that have similar characteristics to those of this study. Separating the study group's geographically in a multicenter study may improve the findings. Further research is necessary to validate our study findings using structured research programs in this area.

The occurrence of childhood febrile seizures is common; thus, parents and caregivers should be provided with information about it. The findings of our study can be used in parent education in pediatric hospitals.

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## Footnotes

**Authors' Contribution:** Study concept and design: Shahla Shahbazi, Mohammad Barzegar, Sousan Valizadeh, Morteza Gojazadeh and Vahid Zamanzadeh; acquisition of data: Shahla Shahbazi; analysis and interpretation of data: Shahla Shahbazi and Mohammad Asghari Jafarabadi; drafting of the manuscript: Shahla Shahbazi, Mohammad Asghari Jafarabadi and Sousan Valizadeh; critical revision of the manuscript for important intellectual content: Mohammad Asghari Jafarabadi and Sousan Valizadeh; statistical analysis: Shahla Shahbazi and Mohammad Asghari Jafarabadi; administrative, technical, and material support: Shahla Shahbazi; study supervision: Shahla Shahbazi.

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