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# Perspectives of febrile convulsions among parents: a local cross-sectional study

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## Abstract

**Background:** Globally, febrile convulsions (FC) constitute a respected prevalence scale among pediatric population. This usually induces a high parental anxiety.

**Aim:** To investigate the local community diversity of perception as regards FC.

**Method:** A cross-sectional anonymous Arabic questionnaire-based study took place targeting the Saudi community. The study included parents with at least a child who underwent FC. Excluded, were those who have children with convulsions due to other causes rather than FC.

**Results:** Eight hundred participants have fulfilled the study inclusion criteria. Majority of them (84%) were mothers. While 10.9% had only one child diagnosed with FC. Participants believed that FC may induce brain damage (41.4%). Others expressed FC attacks to be life-threatening events (52.9%). They were convinced that FC is not related to epilepsy (40.2%). However, a respected percentage of participants denoted the importance of using oral protective devices during the attacks (41.4%). Overall, most study population (84%) had poor perception of the different aspects of FC.

**Conclusion:** Social perception of FC problems may be significantly related to the educational level and profession of the parents. The majority of the study subjects have poor perception as regards FC. Therefore, holistic socially oriented educational programs are needed to orient the population about the problem. They may be implemented via various approaches.

**Keywords:** Febrile convulsions, Epilepsy, Infantile seizure

## Background

Febrile convulsions (FC) are among the commonly encountered benign clinical conditions within the pediatric population. They usually present among infants and children up to the age of 5 years [1].

FC are defined by The International League Against Epilepsy (ILAE) as seizures that occur in children since

their early infantile age because of fever and not related to the central nervous system (CNS) causes [2].

They occur when the temperature reached more than 38 °C [1, 3]. FC are not related to previous neonatal and/or unprovoked seizures. Moreover, they do not simulate other acute symptomatic seizures [2, 3].

Although the prevalence of FC have been discussed and highlighted in the literature [4–8], little were published as regards Saudi populations [3]. None the less, there is no international agreement concerning FC prevalence. It was reported that the peaked FC is around 2–3 years of life with an average rate 6.92% [5].

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FC have an unclear etiology, yet, they proved to have a familial tendency [1]. They may present as simple or complex seizures. Simple seizures account for 80–85% of FC [7]. However, those children with complex FC usually suffer of prolonged drowsiness that follows the increased temperature [7, 9].

Most parents, especially those who had an FC child for the first time, may be terrified as they consider it a lethal condition [10–12].

Most of them are intimidated by the notion that FC may lead to epilepsy, brain damage, as well as long-life physical disabilities [1, 13].

Hence, most parents do not properly respond to FC management [7, 14].

It is of paramount importance that knowledge about FC should be available to all society members.

The current study aimed to gauge the nation-wide parental perception of FC problem. Obtained results would be assets to create a realistic and holistic socially oriented educational program related to FC.

## Method

The current study took place on a national level. It recruits the whole parental population. The questionnaire was designed and validated based on initial pilot study. Validation was done with applying the Cronbach alpha equation aiming to measure the internal consistency and validity of the questions within the questionnaire.

The questionnaire constituted three sections: the first was the participants' demographic data such as age, sex, professions, and education.

The second section was concerned with the children's data such as gender, age, presence of FC, etc.

The third section included questions related to the parents' knowledge, concern, attitude, and practice towards FC.

The study initially involved 1000 participants. Yet, 800 were indulged as they met the inclusion criteria.

The excluded two hundred responders were those who have no children or did not fully respond to the questionnaire. Also, children with previous afebrile seizures, neurological disorders, CNS infections, and seizures with drug withdrawal were excluded.

Re-validation of the questionnaire as well as statistical analysis of the obtained data were done using Statistical Package for the Social Sciences (SPSS) version 22. Data were analyzed using two-tailed tests. A *p* value less than 0.05 was considered statistically significant.

## Results

Eight hundred participants responded to the questionnaire. Out of them, 674 (84%) were mothers. Their ages ranged from 18 to 60 years with a mean of  $43.6 \pm 12.4$

years. Six hundred and twenty-nine (78.6%) were university graduates. Sixteen (2.0%) had not completed secondary school education. Parents' professions and parity levels are shown in Table 1.

Information of families who have children with FC is illustrated in Tables 2 and 3.

Tables 4 thoroughly express the result for the rest of the questions.

Table 5 highlights the relationship between knowledge in relation to education and the profession of the parents. The parents' perception about their future progeny is shown in Fig. 1.

A Low percentage of perceptions is considered when below 60.

## Discussion

Febrile seizures are commonly presented as benign convulsions among the pediatric population. The condition is highly intimidating to the children's family [1]. The current qualitative study took place to investigate this notion.

Eighty-seven (10.9%) of the study population showed only one FC child. Prevalence of the initial attack

**Table 1** Personal data of respondent parents in Eastern region, Saudi Arabia

Parents personal data	No	%
Respondent		
<i>Father</i>	128	16.0%
<i>Mother</i>	672	84.0%
Age in years		
18–30	198	24.8%
31–40	225	28.1%
41–50	244	30.5%
51–60	133	16.6%
Educational level		
<i>Below secondary</i>	16	2.0%
<i>Secondary</i>	155	19.4%
<i>University/above</i>	629	78.6%
Mother job		
<i>Housewife</i>	330	41.3%
<i>Student</i>	61	7.6%
<i>Health care worker</i>	34	4.3%
<i>Non-health care worker</i>	375	46.9%
Father job		
<i>Not working</i>	78	9.8%
<i>Health care worker</i>	60	7.5%
<i>Non-health care worker</i>	662	82.8%
Children		
<i>One child</i>	127	15.9%
<i>&gt; 1 child</i>	673	84.1%

**Table 2** Febrile convulsions related data with family concern and practice, Eastern region, Saudi Arabia

FC related data	No	%
Had child with FC		
No	713	89.1%
Yes	87	10.9%
Age of first FC attack (n = 87)		
6–12 ms	35	40.2%
1–2 years	18	20.7%
2–3 years	24	27.6%
3–5 years	10	11.5%
Child gender (n = 87)		
Male	35	40.2%
Female	52	59.8%
FC was repeated (n = 87)		
Yes	32	36.8%
No	55	63.2%
What made you worry after having child with FC (n = 87)		
Nothing made me afraid	4	4.6%
Fear of being fevered again	35	40.2%
Fear of potential brain damage that affect the child's development	36	41.4%
Fear of risk of subsequent epilepsy	25	28.7%
Fear of that siblings will have FC too	13	14.9%
Fear that the child will die	35	40.2%
First behavior during FC attack (n = 87)		
Try to lower the child's body temperature	22	25.3%
Place the child on his/her side	8	9.2%
Rush the child to a doctor	44	50.6%
Suck discharge from the child's nose and mouth	6	6.9%
Shake and rouse the convulsing child	4	4.6%
Protect the child on a soft and safe surface	1	1.1%
Attempt mouth-to-mouth resuscitation	2	2.3%
What directed you to do such behavior during FC (n = 87)		
I acted unconsciously	50	57.5%
Physician	15	17.2%
Social media	4	4.6%
Books	4	4.6%
Previous experience with family member	5	5.7%
Others	9	10.3%

among their children was (29.9%). In a similar study, the FC prevalence was reported as 37% in the same pediatric age group [12].

On the other hand, a report from a different geographical area stated a higher percentage (50%) of toddlers with FC [15].

In the current study, 52 (59.8%) of children were girls. Among them, about 37% have repeated FC attacks. This data contradicts other literature that express a higher

**Table 3** Distribution of family attitude towards febrile convulsions according to having child with FC

Attitude items	No		Yes		P value
	No	%	No	%	
<b>Had child with FC</b>					
FC is due to possession by spirits					
Disagree	443	62.1%	70	80.5%	.003*
Neutral	234	32.8%	14	16.1%	
Agree	36	5.0%	3	3.4%	
FC attack is a life-threatening event					
Disagree	118	16.5%	24	27.6%	.005*
Neutral	245	34.4%	17	19.5%	
Agree	350	49.1%	46	52.9%	
FC can cause brain damage which affects the child's mental and intellectual development in the future					
Disagree	82	11.5%	16	18.4%	.043*
Neutral	254	35.6%	21	24.1%	
Agree	377	52.9%	50	57.5%	
Herbal remedies can help to manage FC					
Disagree	414	58.1%	67	77.0%	.003*
Neutral	258	36.2%	18	20.7%	
Agree	41	5.8%	2	2.3%	
More attention and care are needed for a child with FC					
Disagree	21	2.9%	5	5.7%	.284
Neutral	81	11.4%	12	13.8%	
Agree	611	85.7%	70	80.5%	
It is shameful to have a child with FC					
Disagree	625	87.7%	82	94.3%	.129
Neutral	67	9.4%	5	5.7%	
Agree	21	2.9%	0	0.0%	

P Pearson  $\chi^2$  test

\*P < 0.05 (significant)

incidence of FC among boys compared to girls [1, 12, 15–17].

Parents' ages at our study ranged from 18 to 60 years. Majority of them were university graduates. This partially coincides with a similar publication that showed an age range from 15 to 50 years, yet, more than 50% of the participants attained primary education [15]. In contrast, others reported 100% of mothers have no formal education [14].

It was reported that variations in educational level are the main pivot for the different parental FC perception [12, 17, 18]. In contrast, most of our study population was university graduates; yet, they showed limited knowledge and information about the FC problem.

Parents were highly concerned about FC complications. A quite respected percentage (41.4%) of them had the concept that FC may lead to irreversible brain

**Table 4** Distribution of family knowledge regarding febrile convulsions according to having child with FC

Knowledge items	No		Yes		P value
	No	%	No	%	
	<b>Had child with FC</b>				
FC is a type of epilepsy					
Correct	253	35.5%	13	14.9%	.001*
Incorrect	109	15.3%	35	40.2%	
Do not know	351	49.2%	39	44.8%	
Anticonvulsant drugs are required for every child with FC					
Correct	128	18.0%	6	6.9%	.001*
Incorrect	162	22.7%	34	39.1%	
Do not know	423	59.3%	47	54.0%	
FC is rare after 5 years					
Correct	117	16.4%	52	59.8%	
Incorrect	104	14.6%	4	4.6%	.001*
Do not know	492	69.0%	31	35.6%	
It is necessary to restrain the child during convulsion					
Correct	187	26.2%	20	23.0%	.040*
Incorrect	145	20.3%	28	32.2%	
Do not know	381	53.4%	39	44.8%	
It is necessary to put a protective device into the mouth to prevent tongue injury during convulsion					
Correct	422	59.2%	36	41.4%	.001*
Incorrect	60	8.4%	16	18.4%	
Don't know	231	32.4%	35	40.2%	
EEG or CT is necessary for every with FC					
Correct	432	60.6%	33	37.9%	.001*
Incorrect	26	3.6%	16	18.4%	
Do not know	255	35.8%	38	43.7%	
Overall knowledge level					
Poor	680	95.4%	73	84%	.001*
Good	33	4.6%	14	16.1%	

P Pearson  $\chi^2$  test

\*P < 0.05 (significant)

damage and developmental retardation. Others (40.2%) had the notion that continuous fever, epilepsy, and death may be the result of FC. These data are relatively comparable to previous similarly published literature [1, 15, 19]. The different concepts might be explained by the differences in educational and social background.

Many reported a high FC recurrence rate among children who had their initial seizures below the age of 15 months [7, 9, 19]. Children with precures suffering of epilepsy have a higher susceptibility rate to have the complex type of FC-related seizures [7, 20].

Such complex FC are also highly presented among children with neurodevelopmental growth retardation [7, 18]. Overall, FC are generally considered a

**Table 5** Distribution of family knowledge regarding febrile convulsions according to respondent's personal data and attitude

Factors	Poor		Good		P value
	No	%	No	%	
	<b>Knowledge level</b>				
Respondent					
Father	123	96.1%	5	3.9%	.301
Mother	630	93.8%	42	6.3%	
Age in years					
18–30	191	96.5%	7	3.5%	
31–40	210	93.3%	15	6.7%	.193
41–50	231	94.7%	13	5.3%	
51–60	121	91.0%	12	9.0%	
Educational level					
Below secondary	16	100.0%	0	0.0%	.049*
Secondary	151	97.4%	4	2.6%	
University/above	586	93.2%	43	6.8%	
Mother job					
Housewife	317	96.1%	13	3.9%	
Student	58	95.1%	3	4.9%	.010*
Health care worker	28	82.4%	6	17.6%	
Non-health care worker	350	93.3%	25	6.7%	
Father job					
Not working	74	94.9%	4	5.1%	.685
Health care worker	55	91.7%	5	8.3%	
Non-health care worker	624	94.3%	38	5.7%	
Children					
One child	121	95.3%	6	4.7%	.548
> 1 child	632	93.9%	41	6.1%	

P Exact probability test

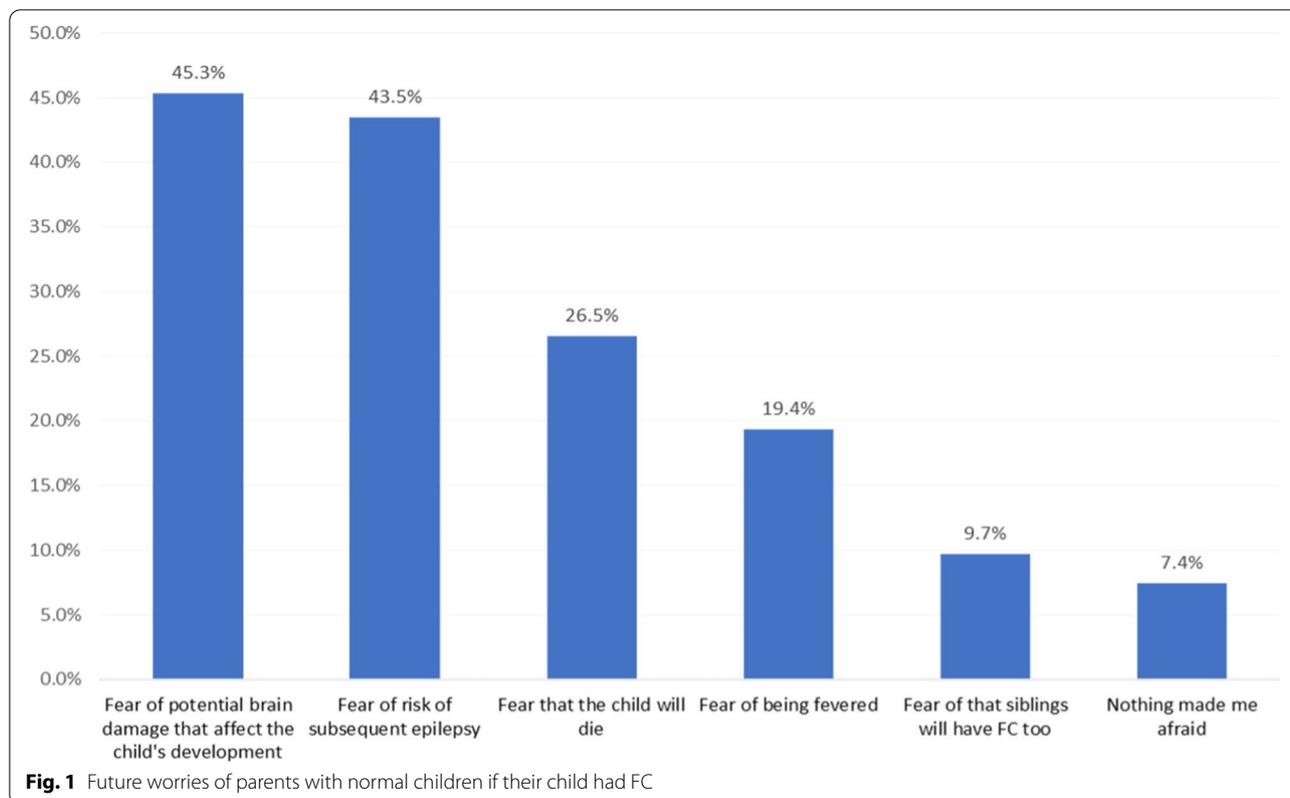
\*P < 0.05 (significant)

self-limited pathology with a good prognosis among the pediatric population. The recurrence rate is about (4%) [7].

We reported 52.9% of participants believing that FC is a life-threatening condition. They also thought that it may cause brain damage with a strong affection of their future mental and intellectual development. These conceptual ideas are supported by previously published reports [7, 9, 12, 18]. This may be attributed to parental fear and anxiety during the attack [1, 12, 14].

Contradicting other studies, 77% of our participants did not believe in herbal medicine as a treatment tool for FC [15, 17, 19, 21]. Interestingly, the majority of our subjects (94.3%) did not consider FC as a shameful condition, compared to others who reported more than 50% of participants believing FC is a stigmatic event [22].

A considerable percentage (40.2%) of the study population were convinced that FC are not a type of epilepsy



and needs not any antiepileptic therapy. Others denoted 73% of the population considering FC as an epilepsy that requires pharmacological therapy [15]. The reason is related to the disparity of educational level that may have influenced their overall perception about the problem [12, 13, 15, 17, 21].

## Conclusion

It may be concluded that FC social perception is highly related to parents' educational level. The current study subjects showed a limited perception of FC and its allied diseases. Therefore, it is recommended to design and implement special social oriented educational programs to holistically transfer the FC-related information to the community. Audiovisual tools, internet, and newspapers as well as other media tools may be helpful in fulfilling this task. Also, social workers and physicians should play an important role in the matter.

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## Authors' contributions

L.A. designed the study; M.A and S.K. collected and analyzed data; O.Z, L.A, and A.S. wrote the manuscript, M.K, R.M, A.A, LA, AA revised the manuscript. All authors read and approved the final manuscript.

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## Availability of data and materials

All data are available on request.

## Declarations

### Ethics approval and consent to participate

The patients' confidentiality and the privacy of their data are the priority. Nothing leads to any ethical issue will be used, such as the names of participants. The ethical clearance given by the ethical committee of college of medicine, King Faisal University. Reference number: 2020-10-71.

### Consent for publication

Not applicable.

### Competing interests

The authors declare that there are no conflict of interests.

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