

# Home Management of Febrile Convulsion among Ghanaian Parents with Children Under Five Years: An Exploratory Case Study

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**Abstract**

Febrile convulsion in children under five years is a common childhood problem, constitutes one of the causes of hospital admissions, and causes anxiety and fear among parents. Empirical information on the condition and how it is managed by parents in Ghana is scarce. This study was therefore, conducted to determine the 5-year (2018-2022) prevalence of the condition, knowledge, and home management of febrile convulsion among parents with children under five years, seeking healthcare for their children in the Holy Family Hospital, Berekum. A mixed method of data collection was used to collect data from 106 participants with interview questionnaires and focus group discussion (FGD) guide. Quantitative data were analyzed using SPSS (version 26) and descriptive statistics were used to interpret the findings. Qualitative data consisted of recorded responses from 2 FGDs, transcribed, and analyzed manually in tandem with the study objectives. The average prevalence of febrile convulsion on admission in the study facility was 2.8% for the 5-year period studied. 77.7% of the respondents had low knowledge on signs and symptoms of febrile convulsion. Causes of febrile convulsion according to participants ranged from elevated temperature (81.1%), inheritance (8.9%), evil spirit possession (6.7%) to no idea (3.3%). Home management of the condition included wiping affected child with water, application of herbal concoction, holding child's legs up with the head down among others. Facility and home management of febrile convulsion are critical to the survival of the affected child. Thus, misconceptions on the causes, signs and symptoms and proper home management and need for facility intervention should be tackled through mass education of parents. Hospital management should also collaborate with media houses to disseminate effective educational information on febrile convulsion and its management among the Ghanaian populace.

**Key words:** Febrile convulsion, Prevalence, Parental Knowledge, Home Management

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## Introduction

Febrile convulsion is one of the most common type of convulsions in children under five years and constitutes one of the causes of hospital admissions (Hakizimana et al., 2021). According to International League Against Epilepsy (ILAE), febrile convulsion is a seizure occurring in childhood between one month and five years of age with associated febrile illness excluding central nervous system infections, neonatal seizures, and acute symptomatic seizures. There are two types of febrile convulsion with 70% classified as simple and 30% as complex. The simple febrile convulsion involves tonic-clonic activity which is generalized and without the features of a focal seizure. Each convulsion lasts for less than ten minutes (Mewasingh, 2014). Whereas the complex febrile convulsion lasts for more than 10 minutes and may reoccur within 24 hours (Sadleir et al., 2007; Mewasingh, 2014).

Globally, seasonal, and diurnal variations in the occurrence of febrile seizures have been investigated. Population studies in Western Europe and the USA report an aggregate occurrence of 2–5%. The frequency elsewhere in the world varies between 5–10% (India), 8.8% (Japan), and 14% (Guam) (Waruiru & Appleton, 2004). In 2010, increased febrile convulsions (FC) occurred after administration of inactivated trivalent influenza vaccine (TIV) in Australia. Overall, FC is seen in about 5% of children - 460 out of 100,000 children under 4 years old (Khair & Elmagrabi, 2015). The prevalence of febrile convulsion among children in North America and Europe, is estimated as 3% to 5% respectively, and up to 14% in Asian children (RCN, 2013). The condition is more common in children from lower socioeconomic status, probably because of inadequate access to medical care (Sajadi &

Khosravi, 2017). The dearth of statistics on febrile convulsion in sub-Saharan Africa may be related to the difficulty in differentiating simple febrile seizures from acute symptomatic/infective seizures, especially if it is due to falciparum malaria infection (Waruiru & Appleton, 2004; Berg et al., 1997). In some cases, in Sub-Saharan Africa, the source of febrile convulsions in children under the age of 5 years could be malaria (Oke et al., 2021; Akpede, Sykes, & Abiodun, 1993), but most parents do not perceive the danger of convulsions when their children have malaria (Ramakrishna, Brieger, & Adeimiyi 1989), and when convulsions set in, the cause is mostly attributed to spiritual sources (Owusu, 2022). However, empirical research in the region has shown that about 25% to 35% of admissions in pediatric emergency wards are as a result of febrile convulsion and febrile-related conditions (Winkler et al., 2013; Nyaledzigbor et al., 2016).

In Ghana, febrile convulsions are the most common type of convulsions in children under five years (Jarret et al., 2012). The 2014 Annual Health Performance Reports from the Volta Region of Ghana indicated that febrile-related conditions accounted for 30% to 40% percent of admissions among children under five years in the region (GHS, 2013). Few studies on febrile convulsion have been conducted in the Volta and Northern regions of the country (Wuni et al., 2021; Konlan et al., 2019; Nyaledzigbor et al., 2016). Statistics in other parts of the country are scarce, and hence, makes this study very important and timely.

The impact of febrile convulsion on parents can be enormous. Parents are usually affected when their children are struck with febrile convulsion, thus, 95% of such parents have concerns about further

seizure attacks (Volta Regional Hospital, 2014), stemming from the emotional trauma and fear that entangle them with the first episode (Kayserili *et al.*, 2008). Parents who witness a healthy child's first seizure retain an unforgettable memory of the event which significantly influences family life and may manifest in parental behaviour such as remaining awake at night or measuring their child's temperature frequently (GHS, 2013). Anxiety increases when febrile convulsion occurs for the first time when they do not know what to do and how the prognosis of the episode would be. Some studies in India and Nigeria have found out that mortality is the most feared among mothers whose children experience seizures (Anigilaje & Anigilaje, 2013; Parmar *et al.*, 2001). More than 75% of respondents do not hold the opinion that their children will be alright during febrile convulsions, and the knowledge level of parents on febrile convulsion reflects the level of their anxiety (Syahida *et al.*, 2016).

Studies elsewhere have shown that more than half of the affected parents have high knowledge on the time-lapse and reoccurrence of febrile convulsion, for instance, a study in Britain indicated that 87 out of 89 parents with children having febrile convulsion lasted for 15 minutes, only two lasted for more than 15 minutes (Verity, 1998). Parents whose children have reoccurring seizures had a better experience in first aid practices (Volta Regional Hospital, 2014). More than 80% of these parents hold the opinion that seizures will reoccur (Syahida *et al.*, 2016). A study conducted in Saudi Arabia found that housewives appear to have more knowledge on febrile convulsion than working mothers (Al-Thaqafy *et al.*, 2022). The importance of parents' knowledge on febrile convulsion necessitated the study by

Toksoz *et al.* (2023) to acquire a scale that measures caregivers and parents' knowledge on febrile convulsion.

The majority of parents (91%) in India do not carry out any intervention before getting the child with febrile convulsion to the hospital (Parmar *et al.*, 2001). In Ghana, parents apply herbal preparations; onions, garlic, and other concoctions to the convulsive child (Wuni *et al.*, 2021; Konlan *et al.*, 2019). However, the realization that these interventions as a way of managing the condition do not work, leads to orthodox medical treatment intervention in a critical state of the child (GHS, 2013).

Abeyssekara *et al.* (2017) reported that 54.6% of mothers in Sri Lanka Considered the family history of convulsion as a factor that increases the risk of FC. Respondents in this study showed that 70% of them believed that it would improve with age. However, Nyaledzigbor *et al.*, 2016 reported that mothers in Ghana believe that FC can be prevented at home, 60% of them indicate that FC can be prevented by reducing fever in children by sponging, while 44% of them mentioned that giving paracetamol syrup to the child having fever can prevent FC.

Although febrile convulsion may not cause death, brain damage or learning disorders, it is quite frightening to observers and parents who witness an episode of febrile convulsion (Hakizimana *et al.*, 2021). Parents also must understand the right time to take their children to the nearest health facility when febrile convulsion occurs. In consequence, parents' ignorance, and poor understanding about how to deal with seizures could lead to mismanagement of febrile convulsion. Hence, knowledge on febrile convulsion is important for parents, especially regarding febrile control, seizure

features and how to manage convulsion at home. Correct managerial skills among parents can prevent complications associated with febrile convulsion, such as head injury, mouth and teeth injury and neck suffocation. Even in the case of health practitioners, when the right protocols are overlooked, it can be dangerous to patients (Kopsidas et al., 2023). This study was therefore carried out to determine the 5-year prevalence rate, knowledge, and home

management of febrile convulsion among parents with children under five years in a Ghanaian peri-urban hospital, to contribute to literature on the subject matter, to form the basis for developing educational messages to parents on the causes, signs and symptoms and home or first aid management of febrile convulsions to improve upon the interventions and outcome of febrile convulsions in the country.

## Methods

### Study Area, Sampling, and sample size

The study was conducted in Berekum, a town in the Bono Region of Ghana with a population of 129,628 people (Population

and Housing Census, 2021), and projected to have a population of 132,869 in 2023 with an annual growth rate of 2.5%. Figure 1 shows the location of Berekum on the map of Ghana.

**Figure 1: The location of Berekum on the map of Ghana.**



The study population consisted of parents seeking healthcare for their children at the Holy Family Hospital, in Berekum. This hospital was selected purposefully for the study because it is the largest referral center in the municipality and access to eligible study participants was relatively easier.

Purposive sampling technique was used to select 106 parents with children admitted on the pediatric ward or attending child welfare clinic in the Holy Family Hospital. All the selected parents were adults aged 18 years and above, had children under 5 years of age, and were willing to participate fully in the study.

### Data Collection Methods and Instrument

The sequential mixed method (Quantitative – Qualitative) approach to data collection was used. The quantitative study utilized interview questionnaires for data collection, and the qualitative study involved focus group discussion (FGD) with an FGD guide. The study instruments for data collection were pretested in another hospital in Berekum (Happy Hospital) and finalized for data collection. Ninety (90) and 16 eligible parents took part in the quantitative and qualitative studies, respectively. The questionnaires for the

quantitative study were made up of semi-structured questions that were divided into three sub-sections: socio-demographic background of respondents, knowledge on what febrile convulsion is, signs and symptoms, causes and management of febrile convulsion. Statistics on Febrile convulsion in the hospital were obtained from the Hospital's records department for 2018 to 2022 to determine the prevalence of febrile convulsion quantitatively in the study hospital. Data collection took place in the last quarter of 2022.

Two FGDs consisting of 8 participants each were conducted to elicit spontaneous responses on what febrile convulsion is, signs and symptoms and how it is managed among parents in the home, for the qualitative aspect of the study. Questionnaire interviews and FGDs were conducted in the English and in Akan languages in a convenient manner to generate the required data for the study.

### **Ethical Consideration**

Approval to conduct the study was given by the Ethics Committee for Humanities (ECH), University of Ghana with the study protocol prior to the commencement of the study in 2022. Approval to conduct the study was sought from the Holy Family Hospital management to collect data in the hospital. Written consent was sought from individual participants before they were interviewed. Interviews were preceded by an explanation of the study purpose and its prospective contribution to the management of febrile convulsion. Participants were then informed about the voluntary nature of their participation and were thus assured of their rights to withdraw from the study any time they felt like doing so without any untoward consequences. Consent was also sought to audio-record the responses from the FGDs

and to publish findings of the study with anonymous quotes from them.

### **Data Analysis**

Quantitative data were analyzed using the statistical package for social science research (SPSS version 26) and descriptive statistics were used to interpret the results. Knowledge of febrile convulsion was assessed based on the correct identification of 6 clinical signs of febrile convulsion - loss of consciousness, global or local twitching/jerking of arms and legs, difficulty breathing, foaming at the mouth, pallor or going blue, and eyes rolling back in the head. Respondents were scored as having high, moderate, or low knowledge based on the number of signs picked from the options provided in the questionnaire. Thus, selecting 5-6 signs was scored high, 3-4 signs was scored as moderate and 0-2 was scored as low knowledge on febrile convulsion.

Responses from the two FGDs were recorded with an electronic audio recorder, and notes were also taken during the FGDs. The recordings were transcribed verbatim and analyzed manually by groping them into themes with the objectives of the study as a guide. Quotes were then selected to instantiate the themes.

### **Results**

Socio-demographic characteristics of quantitative respondents

As depicted in Table 1, about 92.2% (83/90) of participants were females and 7.8% (7/90) were males. The majority of them 65.6% (59/90) were between the ages of 30 and 40 years, about 16.7% (15/90) of the respondents were between 19 and 29 years and the remaining 17.7% (16/90) were 41 years old or above. Most of the respondents- 78.9% (71/90) were married,

16.7% (15/90) had never married before, 3.3% (3/90) were divorced and only of them was a widow. The majority of the respondents 67.7% (61/90) had secondary education (junior high or senior high), 15.6% (14/90) had tertiary education and the remaining 16.7% (15/90) had no formal education. The overwhelming majority-

93.3% (84/90) of the respondents were Christians, 5.6% (5/90) were Muslims and the remaining one was a traditionalist. Most of the respondents- 80% (72/90) were engaged in informal activities as their occupation with the remaining working in the formal sector- (20% (18/90)).

**Table 1: Socio-Demographic Characteristics of Respondents (n = 90)**

	Variable	Frequency	Percentage
Gender	Male	7	7.8
	Female	83	92.7
Age	19-29years	15	16.7
	30-40years	59	65.6
	41+years	16	17.7
Education	No formal education	15	16.7
	Primary/JHS/SHS	61	67.7
	Tertiary	14	15.6
Occupation	Informal	72	80
	Formal	18	20
Religion	Christian	84	93.3
	Muslim	5	5.6
	Traditionalist	1	1.1
Marital status	Married	71	78.9
	Never married	15	16.7
	Divorced	3	3.3
	Widow	1	1.1

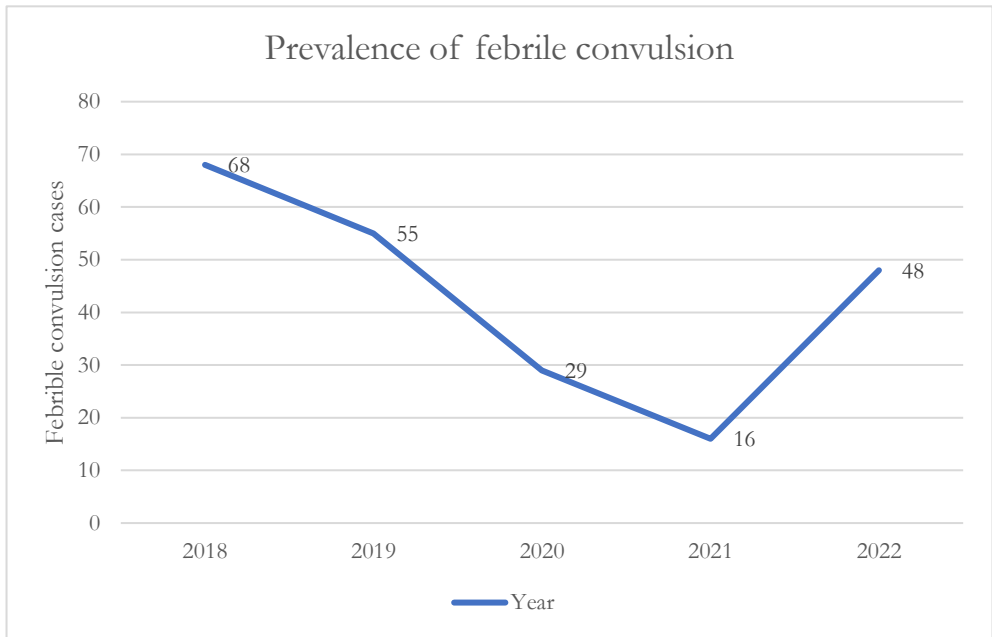
### Socio-Demographic Characteristics of Focus Group Discussion Participants

Participants for the FGDs were made up of 2 males (12.5%) and 14 females (87.5%), their ages ranged from 20 to 47 years old. Eleven (68.8%) were married and the remaining five (31.2%) were single or divorced. Nine (56.3%) had either undergone primary or secondary education, whilst 7 (43.7%) had no formal education.

### Prevalence of febrile convulsion

The figure below shows the number of febrile convulsion cases presented in the

study facility (Holy Family Hospital) in the Berekum Municipality from 2015 to 2019. Information derived from the institutional records of the facility indicated that the highest number of cases of febrile convulsion were admitted in 2015, representing 4.5% (68/1,511) of total admissions as compared to 2.8% (55/1,964) in 2016, 2.4% (29/1,208) in 2017, 1.0% (16/1563) in 2018 and 3.4% (48/1410) in 2019 respectively. The average prevalence per year within the specified period was 2.8% (216/7656) (see Figure 2).

**Figure 2: Prevalence of Febrile Convulsion**

### Perception of what febrile convulsion is among respondents

Participants' responses to what febrile convulsion is ranged from a child falling with elevated temperature 44.4% (40/90), severe shaking or tightening of the muscles 26.8% (24/90), child losing consciousness 17.7% (16/90), difficulty in breathing 8.9% (8/90), to no idea 2.2 % (2/90).

### Respondents' knowledge on the six clinical signs and symptoms of febrile convulsion

The majority, 77.7% (70/90) of the respondents had low knowledge on signs

and symptoms (0-2 clinical signs correctly identified) associated with febrile convulsion, 15.6% (14/90) had moderate

knowledge (3-4 clinical signs correctly identified), with the remaining 6.7 % (6/90) having high knowledge on febrile convulsion (5-6 clinical signs correctly identified).

### Perception of causes of febrile convulsion among respondents

The majority of respondents 81.1% (73/90) indicated elevated temperature as the cause of febrile convulsion, 8.9% (8/90) and 6.7% (6/90) indicated inheritance and evil

spirit possession respectively as the cause of febrile convulsion with the remaining 3.3% (3/90) indicating that they had no idea as to what causes febrile convulsion (see table 2).

**Table 2: Perception of Causes of Febrile Convulsion among respondents, (n= 90)**

Variable	Frequency	Percentage (%)
High temperature	73	81.1
Inheritance	8	8.9
Evil spirit	6	6.7
No idea	3	3.3

#### Home Management of Suspected Febrile Convulsion Among Respondents

About forty percent (37/90) of respondents indicated that it is a common practice among them to wash a convulsive child's face with water, 23.3% (21/90) apply local herbal preparation, 17.8%

(16/90) revealed that holding a convulsing child's legs up with the head down will remedy the situation, 11.1% (10/90) call only men to hold the child or expose the child to smoke and the remaining 6.7% (6/90) indicated that they pray or send the child to a spiritualist (see table 3).

**Table 3: Home management of Febrile Convulsion among Respondents (n= 90)**

Variable	Frequency	Percent (%)
1. Wash the child's face with water	37	41.1
2. Application of herbal concoction (grinded onion, garlic and herbs) on the child's body	21	23.3
3. Hold the child's legs up with the head down	16	17.8
4. Only men are called to attend to the child	6	6.7
5. Expose the child to smoke	4	4.4
6. The child is sent to spiritualist/herbalist	4	4.4
7. Pray for the child	2	2.3

#### Findings from Focus Group Discussion

##### *What is febrile convulsion?*

FGD participants described febrile convulsion in relation to the signs and

symptoms that the child exhibits when he/she is attacked by the condition to include twitching, mouth foaming, loss of consciousness, evil possession, difficulty in breathing and high temperature.



*“Febrile convulsion is when a child becomes stiff and twitch with high temperature” (Participant FGD 1)*

*“Febrile convulsion is when a child losses consciousness and you see foam in his month” (Participant FGD 2)*

*“A child with febrile convulsion shakes severely and falls down, in some cases the child can’t breathe well” (Participant FGD 2)*

Signs and symptoms of febrile convulsion FGD participants stated that high temperature, stiffness, eyes becoming white, and weakness are signs of febrile convulsion. Thus,

*“From experience, the child starts off with high temperature, and the twitching follows with stiffness for some time” (Participant, FGD 2)*

*“A herbalist has informed me that anytime I see my child’s eyes turning white with weakness and high temperature, I must know that my child is having febrile convulsion” (Participant, FGDs 1)*

### **Causes of Febrile convulsion**

FGDs participants mentioned several causes associated with febrile convulsion with a lot of misconceptions on the condition. These include curses from evil spirits, hereditary, improper transmission of blood in the body, and excessive intake of rice porridge as substitute for breast milk. Some participants also attributed the cause of febrile convulsion to elevated temperature resulting from malaria and fever associated with teething in children.

*“My grandmother told me that witches and wizards in some families see children with brighter future and curse or bewitch them with difficulty in breathing and high temperature. Mostly the children shake especially when they are in a public place, thus, disgracing them” (Participant FGD 1)*

*“Me I believe it’s high blood in the head! This can cause the child to lose consciousness and shake severely with febrile convulsion” (Participant FGD 1)*

*“I give my son rice porridge because I want to wean him from the breast, and anytime I give him rice porridge, he falls sick. He will have high temperature, vomit, and shake” (Participant FGD 2)*

*“I have observed that anytime my two-year old daughter’s temperature rises, she twitches and falls down”. (Participant FGD 1)*

*“Growing up, I know children fever results from teething and malaria. When the fever becomes severe, they black out or loss consciences” (Participant FGD 1)*

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### **Home management of febrile convulsion**

Some FGD participants opined that they first use water to wipe a child with febrile

convulsion at home to manage the rise in temperature. Some also indicated holding the child upright with the head down for some time. Others said they grind onions, garlic and local herbs together and smear it on the child. at home to manage febrile convulsion. All these, according to participants are done to manage temperature and seizure before the child is taken to the hospital or a herbalist.

*“I wipe the child with water several times to help bring down the temperature before I take the child to the hospital” (Participant FGD 1)*

*“I smear the child’s body with a mixture of onion, garlic and herbs, I let the child inhale the scent, so as to stop the convulsion” (Participant FGD 2)*

*“I have some friends who manage their children’s high temperature and stiffness with herbal medicine. They say it is very sharp! One touch, and the child gets well” (Participant FGD 2)*

### **Discussion**

Caregivers of sick children have natural preconceived notions and information about their child’s illness, which is likely the case with seizures and febrile convulsion (Hakizimana et al., 2021). Approximately 1 in 20 children will have one before the age of 5 years and is mostly due to common illnesses such as ear infection, cough, colds, and viral infections (GSS, 2010).

The mean annual prevalence of febrile convulsion in the Holy Family hospital as found by the study was 2.8% for children on admission for the period between 2015 – 2019. This figure is quite substantial, and these children deserve to be treated with the best available care. This can only be achieved when parents who are primary caregivers of such children are knowledgeable on the condition and can apply knowledge-based home management techniques to sustain the child until orthodox healthcare facility intervention is sought.

Although the study by Wuni *et al.*, 2021 indicated that 95% of the parents they studied in Northern Ghana had heard about febrile convulsion mostly from other family members, they did not assess their knowledge on the condition. Our study, however, assessed knowledge of the condition among study participants, and findings revealed that most parents had low knowledge on the causes, signs, and symptoms of febrile convulsion. This suggests that the parents' low knowledge of febrile convulsion affected the management of febrile convulsion at home.

This finding is consistent with how Ghanaian parents in the Volta region manage febrile convulsion at home, as they employ herbal preparations, onions, garlic, and concoctions to convulsive children as a way of managing this frightening condition (GHS, 2013; Nyaledzigbor *et al.*, 2016). This indicates how widespread the use of local herbal preparation in the treatment of febrile convulsion in Ghana is, and this is at the detriment of poor and innocent children who have the right to healthy life, and evidence-based treatment of the condition for preservation of life.

When Ghanaian parents are educated on the causes and management of febrile convulsion among children, their fear, anxiety, and misconceptions on the condition will be allayed, consequently, proper home management of the condition may be observed (Oche & Onankpa, 2013) for improved management and outcomes of febrile convulsion among children in the country.

Our study is limited regarding generalization of findings to other parts of the country and elsewhere due to the case

study design and the relatively small number of participants involved. However, in areas within Ghana and elsewhere, where similar contextual issues are observed, our findings may be applicable and useful for drawing up interventions aimed at improving prevention and home management of febrile convulsion.

## Conclusion

This study has unveiled several misconceptions surrounding febrile convulsion among parents that potentially impact on the home management of febrile convulsion in Berekum, Ghana. These misconceptions about febrile convulsion and how the condition is managed at home can lead to increased morbidity or even avoidable death of affected children. Hence, meaningful, and effective interventions on febrile convulsion management at home are possible only when misunderstandings about the causes, signs, and symptoms of febrile convulsion are addressed through mass education of adults and parents. There should, therefore, be an urgent increased effort to institute effective interventional programmes to educate Ghanaian parents especially in the rural areas on febrile convulsion, what it is, signs and symptoms, first aid management and the urgent need to take an affected child to the hospital for appropriate intervention. These educational activities can be integrated into ante-natal and postnatal clinic activities, child welfare clinics and general out-patient department activities. At the community level, the hospital authorities should collaborate with the media houses (TV stations, radio stations and information centers), to plan and implement educational programmes on febrile convulsion consistently for sustained effect.

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