ORIGINAL RESEARCH

Impact of educational program about care of children with febrile convulsion on nurses' knowledge and performance

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ABSTRACT

Background and objective: A febrile (fever) convulsion is a fit or seizure that occurs in children with fever. The key responsibilities of the nurse are to protect the child from injury during seizure and assist in the treatment of the underlying cause. The objective of this study is to determine the impact of educational program on nurses' knowledge and performance.
Methods: Design: Quasi-experimental research design. Subjects and methods: 44 nurses who working at Assiut Children Hospital. Tools: A structured interview sheet and observational check list.
Results: Statistically significant difference between nurses' knowledge and practices after post-test and follow-up.
Conclusions: The nurses' knowledge regarding care of child with febrile seizure were not enough with some unsafe practices. The study recommended On Job Training (OJT) programs are suggested in order to refresh and update nurses' knowledge.

Key Words: Nurses, Pediatric febrile seizures, Convulsions, Febrile convulsion and seizure disorders

1. INTRODUCTION

Febrile Convulsion (FC) is a type of seizures specifically in infancy and childhood. FC is associated with fever and occurs usually between the age 6 months and 6 years that shows no evidence of intracranial infection or defined other causes.[1] There are different types of FC. Convulsions with fever have three explanations: (1) An infection of C.N.S; (2) Seizure disorders in which the initial seizures are triggered by the stress of fever, although subsequent seizures may be a febrile; (3) A simple febrile seizure.[2]

FC is believed to be genetically determined and maternal inheritance is an important factor. Eighty percent of monozy-gotic twins are concordant for FC and siblings of patients with epilepsy are at increased risk of FC.[3] The most common extracranial sources of fever in cases of FC are upper respiratory tract infection, otitis media, pneumonia, influenza, gastroenteritis, or urinary tract infection.[4]

The exact degree of temperature at which FC occur is not exactly known, but usually develops when the temperature reaches 39°C or greater especially if there is rapid rise of temperature.[5] Simple FC is defined as a single brief (< 15 minutes) generalized seizures occurring during the rapid rise of temperature with a brief post-ictal period of drowsiness.[6] Complex febrile (atypical FC) is prolonged (> 15 minutes),

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focal or multiple during the same illness or with prolonged postictal drowsiness.[7] The risk of developing unprovoked seizures is increased by several factors; neurodevelopmental anomalies, complex febrile seizures, recurrent FC, brief duration of fever before initial seizures, and family history of epilepsy.[8]

The main aim of the investigations is to determine the cause of the fever and to exclude intracranial infection, the history and examination may suggest an obvious source of fever such as an otitis media, pharyngitis, pneumonia, gastroenteritis, or urinary tract infection which should be confirmed by urine culture.[3]

Blood cell counts, measurements of glucose, calcium, electrolytes, and urine analysis are not cost effective and can be done according to the circumstances of every case. EEG should be performed on every infant who presented with abnormal neurological examination or with positive family history of epilepsy. CT and MRI are indicated in focal convulsions with focal deficits even transitory following a seizure.[9]

The treatment of FC is controversial. Prophylactic antiepileptic drugs don't appear to be effective in preventing FC Phenobarbital has been recommended in the past but is no more effective than Placebo and the drug has detrimental effect on cognitive and intellectual development in children. Rectal Diazepam, given at the onset of febrile episode, has been recommended to prevent febrile seizures in susceptible children.[10]

In case of febrile convulsion the nurse must reduce the fever by bringing the child's fever down as quickly as possible, remove the child's clothing and apply cold washcloths to the face and neck. If the seizure persists, sponge the rest of the body with cool water. When the convulsion is over and the child is awake, the nurse must give the usual dose of oral fever-reducing medicines (as doctors order's) for the child's weight and age, gradual monitoring for body temperature, and encourage the child to drink cool fluids.[11]

1.1 Significance of the study
During the researcher's work in the neurology and reception units at the Assiut Children Hospital, it has been observed that nurses need to improve their knowledge and performance regarding caring for child with febrile convulsion. So, developing an intervention program will improve nurses' knowledge and performance.

1.2 Aim of the study
This study aimed to determine the impact of educational program about febrile convulsion care on nurses' knowledge

and performance at Assiut Children Hospital.

1.3 Research questions
- What were the nurses known about febrile convulsion?
- In what way nurses deal with child having febrile convulsion?

2. SUBJECTS AND METHODS
The purpose of this chapter is to discuss the research methodology and procedures including the description of the research hypothesis, design, setting, sample, tools, procedure and data analysis.

2.1 Research design
Quasi-experimental research design was used to conduct this study. This design is the same as the classic controlled experimental design except that the subjects cannot be randomly choose. The most common quasi-experimental design is the comparison group Pre-test/Post-test design.

2.2 Setting
The present study was carried out in the neurology & reception units at Assiut Children Hospital. Neurology unit contains from 2 patient rooms, each room has 8 beds and intensive care room have 8 beds. Reception unit contains 8 patient rooms, each room have 5 beds and intensive care room have 8 beds.

2.3 Subjects
The current study included all the available (44) nurses, which consisted from (9) baccalaureate and (35) secondary school degree who working in neurology & reception units at Assiut children Hospital.

2.4 Tools of the study
Two different tools were used to collect study data. These are knowledge test, and an observation checklist.

Tool I: A designed structured interview form was developed by the researcher after reviewing the relevant literature and related studies to collect data for this study. It consisted of two parts.

The first part: Personal and socio-demographic data sheet. It included data about study subjects such as age, marital status, qualification, job position, years of experience, current job experience and previous attendance of training courses. The second part involved the following data. It was developed by the researcher based on related literatures and studies. It was used to assess nurses' knowledge about febrile convulsion care. This part included questions about febrile convulsion such as definition, causes, classification, signs and symptoms,

febrile convulsion precautions and nursing care during and after febrile convulsion.

Tool II: Observation Check list. A checklist, sometimes called a tick chart, is an inventory of behaviors or skills that the observer marks or checks if the pupil is seen to demonstrate them. This tool covered the performance of the study subjects. It included especially design observation checklist form was developed by the researcher to assess the performance of the nurses. This tool was used before and after the program to evaluate the effectiveness of the training program on the nurses' performance while using educational model.

The observation checklist included the following procedures:

- Nurses' performance as regards to nursing role during febrile convulsion.
- Nurses' performance as regards to nursing role after febrile convulsion.
- The same tools was used immediately after implementation of the program (immediate post-test), in addition to three months later to evaluate the gain of knowledge after the intervention.

2.5 Study method
2.5.1 *Preparatory phase and administrative design*
- An official letter approval was obtained from the Dean of Faculty of Nursing, Assiut University to the Director of Assiut Children Hospital.
- This letter included a permission to carry out the study and explain the purpose and nature of the study.

2.5.2 *Pilot study*
A pilot study was carried out before starting data collection on three nurses chosen randomly who was excluded from the sample. The aim of pilot study is to test the clarity, applicability of tools and to estimate the time required to fill the questionnaire. Based on the pilot study, the necessary modifications in the sheet were done.

2.6 Ethical consideration
The purpose of this study was explained for every individual that include Director of the Neurology & Reception Units and subjects of the study sample. Nurses have ethical rights to participate or refuse participation in the study. Consent to participate in the study was written from director and oral from nurses, informed them that the information obtained would be confidential and used only for the purpose of the study.

2.7 Validity
The validity of the study tool was assessed to check the relevance, coverage, and clarity of the questions by a jury panel

of professors from five expert pediatric fields.

2.8 Reliability
Reliability was estimated by Alpa Cronbachs test for study.

2.9 Results of the test
Knowledge scale = 0.851; Practice scale = 0.883; Total = 0.819.

2.10 Practical work
Data was collected in the period from first of April to the end of the July at first; the researcher assessed the nurses' needs before the program through an interview questionnaire and follow up 3 months for post-test after program directly.

The study was carried out in three phases:

Phase 1: Identification of the training needs for the nurses through:
- Assessment of nurses knowledge about febrile convulsion such as definition, causes, classification, signs and symptoms, febrile convulsion precautions and nursing care during and after febrile convulsion.
- Assessment of nurse's performance by using the observation check-list. This was conducted by the researcher in the neurology & reception units at Assiut Children Hospital. Care taken that the nurses were not recognized that.

Phase 2: Educational program
(1) Design a training program according to nurse's needs.
(2) Develop and implement an educational program meeting the nurses need regarding to the care of febrile convulsion.
(3) Develop an educational booklet to the nurses to provide them with needed information for caring of child with FC (definition of FC, different types, nursing care, *etc.*).

Table 1 shows the plan of the educational program.
- General objective of the educational training health program. Improve knowledge and performances of nurses regarding caring of child with FC.
- Teaching time: The time of teaching sessions started at 8 pm during the night shift.
- Teaching place: The program conducted at Assiut Children Hospital

Phase 3: Evaluate the degree of improvement for the nurse's knowledge and performance by using immediate post-test for knowledge and performance at 3 months after the program. An interview was conducted for nurses on an individual basis.

2.11 Scoring system

2.11.1 Assessment of nurses' knowledge

To assess the knowledge of nurses regarding seizure disorders and care of child with seizure, a scoring system was applied, one score was given for each correct answer and zero for incorrect answer. The maximum total score for knowledge was 50 divided as follows:

- Knowledge concerning the disease scored 22.

- Knowledge concerning nursing role during seizure scored 14.
- Knowledge concerning nursing role after seizure scored 2.
- Knowledge concerning indication for calling E.M.S. scored 7.
- Knowledge concerning seizure's precautions scored 5.

Table 1. Time table of the educational program for nurses regarding FC

Day / Session	Contents	Method of teaching and Media	Evaluation
First day/session I: 2 hs	Orientation - Definition of FC - The different types of FC	- Brainstorming - Discussions - Handout	Posttest questionnaire
Second day/session II: 2 hs	- Causes of FC - When FC can be fatal - Preventive measures for child at risk for FC	- Brainstorming - Discussions - Handout	Posttest questionnaire
Third day/session III: 2 hs	-Diagnosis and treatment of FC - Nursing care before FC - Nursing care during FC - Nursing after FC	- Brainstorming - Discussions - Handout - Role play - Simulation	Posttest questionnaire Observational checklist
Fourth day/session V: 2 hs	- Revision - Post-test	- Brainstorming - Discussions - Handout	Posttest questionnaire

2.11.2 Assessment of nurses' performance

To assess the performance of nurses regarding care of child with seizure, scoring system was applied, one score was given for each item done correctly and zero for each incorrect and/or not done item. The maximum total score for performance was 16 divided as follows:

- Nurses' performance during seizure scored 14;
- Nurses' performance after seizure scored 2.

The total score of either knowledge or performance of nurses was judged as follows: Each question have correct answer = 1 or incorrect = 0; < 50% = poor; 50%-<75% = moderate; 75 and more = good.

2.12 Analysis of data

Collected data was revised and coded for computerized data entry. Data were then verified prior to statistical analysis. Statistical methods were applied including descriptive statistics such as (frequency, percentage, ANOVA and χ^2) were used. p-values were considered statistically significant when they were less than .05.

Table 2 shows the personal data of the studied nurses in Assiut Child Hospital. Regarding age of the studied nurses, it was observed that 43.2% of them aged < 24 years, while 47.7% of them had < 5 years of experience. According to their qualifications, 79.5% of them had secondary school degree.

Table 2. Personal data of the studied nurses in Assiut Child Hospital, 2014

Items	No. (n = 44)	%
Age		
< 24 years	19	43.2
24-28 years	9	20.4
29-33 years	5	11.4
≥ 34 years	11	25.0
Years of experience		
< 5 years	21	47.7
5-10 years	10	22.7
> 10 years	13	29.5
Attending training courses		
Yes	24	54.5
No	20	45.5
Qualifications		
Baccalaureate degree	9	20.5
Secondary school degree	35	79.5

Table 3. Nurses' knowledge regarding febrile seizure throughout intervention program phases, Assiut Children Hospital, 2014

Items	Pre		Post		Follow up		p-value
	No.	%	No.	%	No.	%	
Knowledge concerning the disease							
a-Definition of febrile seizure	8	18.2	34	77.3	23	52.3	.001**
b-Classifications of febrile seizure							
Simple	6	13.6	5	11.4	1	2.3	.002**
Complex	9	20.5	1	2.3	3	6.8	
Both	20	45.5	36	81.8	35	79.5	
c-Manifestations of febrile seizure							
Fever	37	84.1	40	97.7	40	97.7	.508
Disturbance in Consciousness	26	59.1	36	81.8	32	72.7	.060
Perception	5	11.4	23	52.3	14	31.8	.001**
Behaviors	7	15.9	28	63.6	24	54.5	.001**
Sensation	18	40.9	29	65.9	28	63.6	.032*
Posture	4	9.1	17	38.6	10	22.7	.005**
Involuntary movements	39	88.6	40	90.9	36	81.8	.416
Knowledge concerning nurses' role during febrile seizure							
1) Determine seizure duration.	17	38.6	40	90.9	33	75.0	.001**
2) Do not attempt to restrain child.	23	52.3	38	86.4	34	77.3	.001**
3) Place small cushion or blanket under child's head.	10	22.7	26	59.1	22	50.0	.002**
4) Do not put anything in child's mouth.	22	50.0	37	84.1	29	65.9	.003**
5) Remove eyeglasses if present.	3	6.8	18	40.9	18	40.9	.001**
6) Loosen clothes.	25	56.8	24	54.5	22	50.0	.808
7) Prevent child from hitting head on sharp objects.	18	40.9	31	70.5	24	54.5	.020*
8) Remove hazards (furniture).	11	25.0	29	65.9	28	63.6	.001**
9) Pad objects such as: side rails.	5	11.4	19	43.2	16	36.4	.003**
10) Keep side rails raised when child is sleeping.	24	54.5	25	56.8	27	61.4	.805
11) No interference during seizure attack.	10	22.7	23	52.3	17	38.6	.017*
12) Position child with head in mid-line.	13	29.5	37	84.1	25	56.8	.001**
13) Turn child to side in case of vomiting.	23	52.3	24	54.5	20	45.5	.674
14) Use non pharmacological methods for decrease body temperature.	27	61.4	42	95.5	39	88.6	.001**
15) Give medication as doctor's prescriptions.	43	97.7	44	100.0	41	93.2	.165
Knowledge concerning nurses' role after febrile seizures							
Determine postictal duration.	17	38.6	39	88.6	32	72.7	.001**
Maintain child in a side position.	17	38.6	35	79.5	36	81.8	.001**
Use non pharmacological methods for decrease body temperature.	28	63.6	36	81.8	35	79.5	.100ns
Give antipyretic medication as doctor's prescriptions.	41	93.2	43	97.7	40	90.9	.394ns
Knowledge concerning indication for call EMS if							
Child stops breathing.	30	68.2	38	86.4	36	81.8	.095ns
There is evidence of injury.	21	47.7	26	59.1	24	54.5	.491ns
Seizure lasts for more than 5 minutes.	14	31.8	35	79.5	31	70.5	.001**
Status epilepticus occurs.	2	4.5	28	63.6	25	56.8	.001**
Child vomits continuously30minutes after seizure has ended.	19	43.2	32	72.7	33	75.0	.003**
Child cannot be a wakened and is unresponsive to pain after seizure has ended.	26	59.1	36	81.8	34	77.3	.040*
This is child's first seizure.	17	38.6	32	72.7	36	81.8	.001**
Knowledge concerning febrile seizures precautions							
Observe for child's body temperature to early detection for hyperthermia.	24	54.5	38	86.4	41	93.2	.001**
Reduce body temperature when hyperthermia by encourage the child to drink cool fluids.	14	31.8	22	50.0	26	59.1	.033*
If hyperthermia occurs remove the child's clothing and apply cold compresses to the face and neck and sponge the rest of the body with cool water.	24	54.5	34	77.3	32	72.7	.081ns
Give the usual dose of oral fever-reducing medicines (as doctor's prescriptions) for the hyperthermic child.	35	79.5	40	90.9	39	88.6	.300ns

* Statistically significant difference (p level < .05); ** Statistically significant difference (p level < .01); Ns: No statistically significant difference (p level > .05)

Table 3 indicates nurses' knowledge regarding FC throughout intervention program phases; it was observed that 18.2% of nurses had knowledge about FC before the educational program while 77.3% of them had knowledge after the program application. Concerning their knowledge about classification of FC before the educational program, it was found that 13.6%, 20.5% and 45.5% of them had knowledge about classification. So, it was found that there are statistical significant differences between pre, post and follow-up in referring to nurses' knowledge about definition and classifications of FC.

In referring to nurses' knowledge about their role during FC, it was noticed that before application of the program 38.6%, 52.3%, 22.7%, 50.0%, 6.8% of them had knowledge about; determine seizure duration, do not attempt to restrain child, place small cushion or blanket under child's head, do not put anything in child's mouth and remove eyeglasses if present respectively. While after the application of the program 90.9%, 86.4%, 59.1%, 84.1% and 40.9% respectively of them had knowledge about their role during FC.

In referral to their knowledge about their roles after FC, it was found that 38.6% of the studied nurses had knowledge about determine postictal duration and maintain child in a side position. While these improved after the program to be 88.6% and 79.5%. As regarding to nurses' knowledge about F.C precautions; it was found that before the program 54.5% and 31.8% of nurses had knowledge about observing for child's body temperature to early detection for hyperthermia and reducing body temperature when hyperthermia by encourage the child to drink cool fluids, compared with 86.4% and 50.0% after the program.

Table 4 shows nurse's performance about febrile seizure throughout intervention program phases, it was found that nurses' role during the attack improved after the intervention program. While there are no statistical significant differences in accordance to turning the child to side in case of vomiting, removing the eyeglasses and loosening the child's clothes 36.4%, 9.1% and 45.5% compared with 31.8%, 22.7% and 63.6% respectively after the application of the program.

Table 4. Nurse's performance about febrile seizure throughout intervention program phases, Assiut Children Hospital, 2014

Items	Pre (n = 44)		Post (n = 44)		Follow up (n = 44)		p-value
	No.	%	No.	%	No.	%	
Nursing role during febrile seizure							
1) Determine seizure duration.	16	36.4	34	77.3	33	75.0	.001**
2) Do not attempt to restrain child.	27	61.4	42	95.5	43	97.7	.001**
3) Place small cushion or blanket under child's head.	3	6.8	7	15.9	11	25.0	.066ns
4) Do not put anything in child's mouth.	24	54.5	40	90.9	39	88.6	.001**
5) Remove eyeglasses if present.	4	9.1	10	22.7	7	15.9	.217ns
6) Loosen clothes.	20	45.5	28	63.6	21	47.7	.177ns
7) Prevent child from hitting head on sharp objects.	10	22.7	21	47.7	12	27.3	.029*
8) Remove hazards (furniture).	11	25.0	25	56.8	19	43.2	.010**
9) Pad objects such as: side rails.	2	4.5	11	25.0	6	13.6	.024*
10) Keep side rails raised when child is sleeping.	16	36.4	23	52.3	10	22.7	.016*
11) No interference during seizure attack.	20	45.5	38	86.4	40	90.9	.001**
12) Position child with head in mid-line.	10	22.7	11	25.0	9	20.5	.879ns
13) Turn child to side in case of vomiting.	16	36.4	14	31.8	11	25.0	.511ns
14) Use non pharmacological methods for decrease body temperature.	22	50.0	39	88.6	37	84.1	.001**
15) Give medication as doctor's prescriptions.	43	97.7	44	100.0	38	86.4	.009**
Nursing role after febrile seizure							
Determine postictal duration.	15	34.1	37	84.1	32	72.7	.001**
Maintain child in a side position.	10	22.7	33	75.0	26	59.1	.001**
Use non pharmacological methods for decrease body temperature.	19	43.2	29	65.9	20	45.5	.141ns
Give antipyretic medication as doctor's prescriptions.	42	95.5	42	95.5	39	88.6	.342ns

Note. Chi-square test used to obtain *p* value; * Statistically significant difference (*p* level < .05); ** Statistically significant difference (*p* level < .01); Ns: No statistically significant difference (*p* level > .05).

As regarding to their role after the attack, there are improvement in their performance in determining the postictal duration and maintain the child in a side position, compared with no improvement in the practice of using of non-pharmacological drug methods for decrease body temperature and giving antipyretic drug as doctor's prescriptions p-value .001, .001, .141 and .342 respectively.

Figure 1 shows the total score of nurse's knowledge and practice during pre, post and follow up, it indicates that there is improvement in nurses and performance after intervention of the educational program; 18.9%, 30.2% and 27.6% for nurses' knowledge and 7.5%, 16% and 14.3% respectively for the nurses' practices.
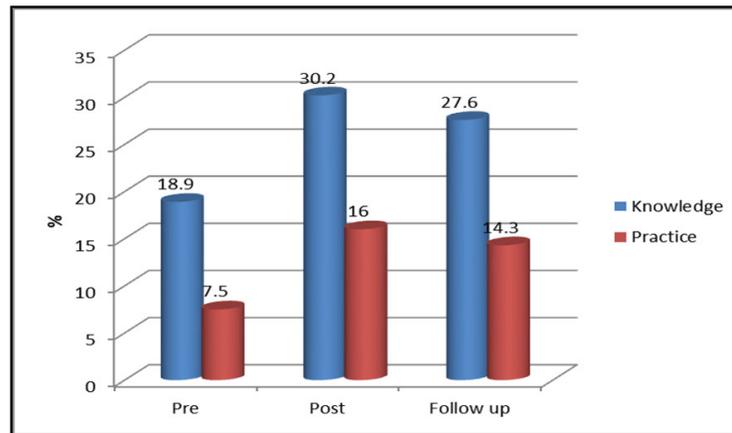
Figure 1. Total score of nurse's knowledge and practice during pre, post and follow up, Assiut Children Hospital, 2014

Table 5 shows comparison between total nurse's knowledge and practice among pre, post and follow up, it was noticed that there is statistical significant difference between nurses' knowledge and practices after post-test and follow-up.

Table 6 shows the relationship between nurse's knowledge and their characteristics during pre, post and follow up; there is statistical differences between nurses' knowledge and their history of attending training courses p-value = .001.

Table 7 indicates the relationship between nurse's performance and their characteristics during pre, post and follow up; there is statistical differences between nurses' performance and their history of attending training courses p-value

= .013.

3. DISCUSSION

FC presents the most common problem in pediatric neurology. Occurring in childhood after age one month associated with a febrile illness not caused by an infection of the CNS, without previous neonatal seizures or a previous unprovoked seizure and not meeting criteria for other acute symptomatic seizures characteristics. The typical febrile convulsion is a generalized tonic clonic seizure lasting between a few seconds and 15 minutes, followed by a period of drowsiness.[12, 13]

Table 5. Comparison between total nurse's knowledge and practice among pre, post and follow up in Assiut Children Hospital, 2014

Items	Pre		Post		Follow up		*p*-value
	No.	%	No.	%	No.	%	
Knowledge							
Poor	23	52.3	3	7.1	10	22.7	< .001**
Moderate	21	47.7	15	35.7	14	31.8	
Good	0	0.0	24	57.1	20	45.5	
Practice							
Poor	29	65.9	8	18.2	9	20.5	< .001**
Moderate	13	29.5	14	31.8	16	36.4	
Good	2	4.5	22	50.0	19	43.2	

Note. ANOVA test used to obtain *p* value flowed by SLD for multiple comparisons; ** Statistically significant difference (*p* level < .01).

Table 6. Relationship between nurse's knowledge and their characteristics during pre, post and follow up in Assiut Children Hospital, 2014

	knowledge before program					knowledge post program							knowledge follow up						
	Poor		Moderate		Good	p	Poor		Moderate		Good		p	Poor		Moderate		Good		p
	No.	%	No.	%	No.	%		No.	%	No.	%	No.	%		No.	%	No.	%	No.	%	
Age																				
< 24 years	8	34.8	11	52.4	0	0.0		0	0.0	6	40.0	13	50.0		1	11.1	6	42.9	12	57.1	
24-28 years	6	26.1	3	14.3	0	0.0	.350	2	66.7	2	13.3	5	19.2	.330	2	22.2	4	28.6	3	14.3	.081
29-33 years	4	17.4	1	4.8	0	0.0		0	0.0	3	20.0	2	7.7		3	33.3	2	14.3	0	0.0	
≥34 years	5	21.7	6	28.6	0	0.0		1	33.3	4	26.7	6	23.1		3	33.3	2	14.3	6	28.6	
Years of experience																				
< 5 years	10	43.5	11	52.4	0	0.0		1	33.3	7	46.7	13	50.0		2	22.2	7	50.0	12	57.1	
5-10 years	6	26.1	4	19.0	0	0.0	.805	1	33.3	3	20.0	6	23.1	.973	2	22.2	4	28.6	4	19.0	.334
> 10 years	7	30.4	6	28.6	0	0.0		1	33.3	5	33.3	7	26.9		5	55.6	3	21.4	5	23.8	
Qualification																				
Baccalaureate degree	2	8.7	7	33.3	0	0.0	.043*	0	0.0	2	13.3	7	26.9	.385	0	0.0	4	28.6	5	23.8	.220
Secondary school degree	21	91.3	14	66.7	0	0.0		3	100.0	13	86.7	19	73.1		9	100.0	10	71.4	16	76.2	
Attending training courses																				
Yes	7	30.4	17	81.0	0	0.0	.001**	0	0.0	8	53.3	16	61.5	.127	2	22.2	7	50.0	15	71.4	.042*
No	16	69.6	4	19.0	0	0.0		3	100.0	7	46.7	10	38.5		7	77.8	7	50.0	6	28.6	

Note. Chi-square test used to obtain *p* value; * Statistically significant difference (*p* level < .05); ** Statistically significant difference (*p* level < .01); Ns: No statistically significant difference (*p* level > .05).

Table 7. Relationship between nurse's performance and their characteristics during pre, post and follow up in Assiut Children Hospital, 2014

Characteristics	Performance before program						p	Performance post program						p	Performance follow up						p
	Poor		Moderate		Good			Poor		Moderate		Good			Poor		Moderate		Good		
	No.	%	No.	%	No.	%		No.	%	No.	%	No.	%		No.	%	No.	%	No.	%	
Age																					
< 24 years	11	37.9	7	53.8	1	50.0		2	25.0	4	28.6	13	59.1		2	22.2	4	26.7	13	65.0	
24-28 years	7	24.1	1	7.7	1	50.0	.333	3	37.5	3	21.4	3	13.6	.368	2	22.2	3	20.0	4	20.0	.136
29-33 years	5	17.2	0	0.0	0	0.0		1	12.5	3	21.4	1	4.5		2	22.2	3	20.0	0	0.0	
>34 years	6	20.7	5	38.5	0	0.0		2	25.0	4	28.6	5	22.7		3	33.3	5	33.3	3	15.0	
Years of experience																					
< 5 years	12	41.4	7	53.8	2	100.0		2	25.0	6	42.9	13	59.1		3	33.3	5	33.3	13	65.0	
5-10 years	8	27.6	2	15.4	0	0.0	.529	4	50.0	2	14.3	4	18.2	.197	2	22.2	4	26.7	4	20.0	.275
> 10 years	9	31.0	4	30.8	0	0.0		2	25.0	6	42.9	5	22.7		4	44.4	6	40.0	3	15.0	
Qualification																					
Baccalaureate degree	4	13.8	3	23.1	2	100.0	.013*	1	12.5	1	7.1	7	31.8	.167	3	33.3	0	0.0	6	30.0	.052
Secondary school degree	25	86.2	10	76.9	0	0.0		7	87.5	13	92.9	15	68.2		6	66.7	15	100.0	14	70.0	
Attending training courses																					
Yes	13	44.8	11	84.6	0	0.0	.016*	5	62.5	5	35.7	14	63.6	.230	5	55.6	5	33.3	14	70.0	.098
No	16	55.2	2	15.4	2	100.0		3	37.5	9	64.3	8	36.4		4	44.4	10	66.7	6	30.0	

Note. Chi-square test used to obtain *p* value; * Statistically significant difference (*p* level < .05); ** Statistically significant difference (*p* level < .01); Ns: No statistically significant difference (*p* level > .05).

FC is the most common type of seizure in children. They are generally of excellent prognosis. It has become generally accepted that seizures known to be symptomatic of an underlying infection should not be called febrile convulsions. It is an epileptic seizure occurring in childhood after age one month, associated with a febrile illness not caused by an infection of the CNS, without previous neonatal seizures or a previous unprovoked seizure and not meeting criteria for other acute symptomatic seizures.[14, 15]

According to nurses' knowledge about febrile convulsion through pre, post and follow-up, it was found that there was improvement in the nurses' knowledge about definition of febrile convulsion after the educational program and follow-up *p*-value .001. Many of the participated nurses due to their educational qualifications may didn't have the adequate knowledge regarding this point, but their knowledge improved after the educational program and also during period of follow-up.

Recently, clinicians have begun classifying FS as either simple or complex. Simple FS is defined as generalized, lasting less than 15 minutes, comprised of generalized tonic and clonic activity without a focal component, and without recurrence within 24 hours or within the same febrile illness. Complex or complicated FS is defined as exhibiting one or more of the following features: Partial onset or focal features; prolonged duration of more than 15 minutes; recurrent febrile seizure within 24 hours of the first episode and association with postictal neurological abnormalities.[16, 17]

In referral to the nurses' knowledge regarding classifications of febrile convulsions, there was improvement in knowledge about both types of febrile convulsion after post and follow-up of educational program p-value .002.

A seizure is an abnormal and excessive discharge of neurons in the brain involving hyper-synchrony (many neurons firing simultaneously). There may be clinical behavioral changes such as: the child/infant often presenting with impaired consciousness and rhythmic jerking of the extremities, other symptoms may include: Sudden tightening (contractions) of muscles on both sides of the body, crying or moaning, falling if standing, vomiting or biting of tongue, sometimes the child may not breath and begin to turn blue, rhythmic jerking and no response to external voices, the passing of urine and feces. Less commonly, the child becomes rigid or has twitches in only a portion of the body such as an arm or a leg, or on the right or the left side of the body.[18, 19]

According to nurses' knowledge about manifestations of febrile convulsion, it was found that there aren't statistical significance differences in nurses' knowledge about fever, disturbance in consciousness and involuntary movements p-values: .508, .060 and .416 respectively, during pre, post and follow-up. While, there are improvement in their knowledge about perception, behaviors, sensation and posture, p-values: .001, .001, .032 and .005 respectively regarding manifestations of febrile convulsion.

Initial nursing assessment and management is aimed at maintaining oxygenation and minimizing the risk of complications. The nurse must remain with the child and family and ensure that oxygen, suction and resuscitation equipment are readily accessible.[20]

The child should be placed in a semi-prone position and protected from any additional injury. It is imperative that the nurse observe, assess and document the presenting characteristics of the febrile convulsion: Assess the child's color, continuous assessment of vital signs including pulse oximetry, accurate timing of the febrile convulsion, note for alterations in consciousness and document motor sensory and autonomic function, as soon as is appropriate record the

child's temperature, if possible remove warm clothing and pharmacological and non-pharmacological methods of temperature regulation.[20–22]

Regarding the nurses' roles during the attack of convulsion, there were statistical significance differences in referral to determine seizure duration, do not attempt to restrain child, place small cushion or blanket, do not put anything in child's mouth, p-values: .001, .001, .002, 0.003, respectively, while there aren't statistical significant differences in referral to loosen clothes, keep side rails raised, turn child to side in case of vomiting and give medication as doctor's order, p-values: .808, .805, .674 and .165 respectively through pre, post and follow-up after educational program.

Nurses' performances during pre, post and follow up revealed that there are improvement in referral to the following practices determine seizure duration, do not attempt to restrain child, do not put anything in child's mouth, prevent child from hitting, remove hazards, keep side rails raised, p-values: .001, .001, .001, .029, .010 and .024 respectively, while there no change in their practices regarding place small cushion or blanket under child's head, remove eyeglasses, loosen clothes and turn child to side in case of vomiting, p-values: .066, .217, .177 and .511 respectively during phases of educational program.

Regarding to nurses' performances after febrile seizure, it was observed that there was improvement in their practices regarding to determine postictal duration and maintain child, p-values: .001 and .001, while there isn't statistical significance difference in referral to their practices in using non pharmacological and giving antipyretic p-values: .141 and .342.

The comparison between nurses' knowledge and their practices during their fever management practices with improved knowledge will be in an ideal position to educate the parents of the febrile children in their care, providing an ongoing improvement in the health of these children.

4. CONCLUSION

The nurses' knowledge regarding care of child with FC were poor before application of the program with some unsafe practices. The study results showed a marked improvement of overall knowledge and performance scores after educational intervention. The study emphasis on the importance of enhancing of nurses' knowledge and it's implication on their performance. Also, the study confirms the need for further multifaceted educational training program for improving nurses' management of child with FC.

CONFLICTS OF INTEREST DISCLOSURE

The authors declare that there is no conflict of interest.

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