PSYCHOLOGICAL FUNCTIONING IN PARENTS OF CHILDREN BEING ADMITTED FOR FEBRILE SEIZURES IN HOSPITAL UNIVERSITI SAINS MALAYSIA

DR MUHAMMAD AMIRO RASHEEQ BIN MOHD RADZI

DISSERTATION SUBMITTED IN PARTIAL FULLFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF MEDICAL (PAEDIATRICS)

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LIST OF ABBREVIATION AND SYMBOLS

DASS	Depression Anxiety Stress Score
HUSM	Hospital Universiti Sains Malaysia
ILAE	International League against Epilepsy
AAP	American Academy of Pediatrics
FS	Febrile seizures
UTI	Urinary tract infections
AGE	Acute gastroenteritis
USD	United States Dollar
RM	Ringgit Malaysia
SPSS	Statistical package for the social sciences
SD	Standard deviation
CI	Confidence Interval
OR	Odds ratio

ABSTRAK

Pengenalan: Demam sawan dalam kalangan kanak-kanak merupakan pengalaman yang membimbangkan ibu bapa. Kajian ini bertujuan untuk menilai fungsi psikologi ibu bapa kanak-kanak semasa mereka dimasukkan untuk rawatan sawan demam di hospital, kepentingannya jelas memandangkan ibu bapa adalah penjaga utama anak-anak mereka.

Kaedah: Kajian keratan rentas ini dijalankan dalam kalangan 110 peserta kepada kanak-kanak yang telah dimasukkan ke Hospital Universiti Sains Malaysia untuk rawatan susulan demam sawan yang bermula dari September 2020 hingga Jun 2021. Tahap kemurungan, kebimbangan dan tekanan emosi ditentukan menggunakan borang soal selidik Depression, Anxiety and Stress Scales (DASS-21) yang telah disahkan dalam versi Bahasa Melayu. Di samping itu, regresi logistik berganda digunakan untuk menentukan faktor-faktor yang berkaitan dengan fungsi psikologikal peserta.

Keputusan: Purata umur kanak-kanak yang mengalami demam sawan ialah 21 bulan, dan kebanyakan kanak-kanak menunjukkan ciri-ciri demam sawan ringkas (71.8%). Secara keseluruhan, sejumlah 58.2% peserta mengalami kebimbangan, 29% mengalami tekanan dan 23.6% mengalami kemurungan. Menggunakan kaedah regresi logistik berganda, umur kanak-kanak ($p<0.050$), sejarah keluarga yang mengidap demam sawan ($p=0.027$), sejarah keluarga yang menghidap epilepsi ($p=0.045$), dan tempoh tinggal di wad ($p=0.041$) didapati mempunyai kaitan yang signifikan dengan kebimbangan apabila dibandingkan untuk pembolehubah lain.

Kesimpulan: Tahap kebimbangan dalam kalangan peserta amat tinggi apabila anak-anak mereka dimasukkan ke hospital untuk demam sawan. Beberapa faktor mempengaruhi kebimbangan

mereka, hal ini termasuklah semakin rendah umur kanak-kanak itu, peserta yang tidak mempunyai sejarah keluarga yang mengalami demam sawan dan tempoh tinggal di hospital yang lebih lama. Oleh itu, kajian lanjut dan intervensi untuk mengurangkan kebimbangan dalam kalangan ibu bapa perlu lebih ditekankan untuk kajian pada masa hadapan.

ABSTRACT

Introduction: Febrile seizures in children are an alarming experience for parents. This study aimed to assess the psychological functioning of parents of children when they were being admitted for treatment of febrile seizures in hospital, the importance of which is clear since parents are the primary custodian of their children.

Methods: This is a cross-sectional study conducted on 110 participants whose child had been admitted for a febrile seizures to Hospital Universiti Sains Malaysia from September 2020 until June 2021. The depression, anxiety, and stress levels were determined based on a validated Bahasa Melayu questionnaire of the Depression Anxiety Stress Scale (DASS-21). In addition, multiple logistic regression was used to determine the associated factors related to the participants' psychological functioning.

Results: The mean age of children with febrile seizures was 21 months old, and most children showed features of simple febrile seizures (71.8%). The prevalence of anxiety, stress, and depression was 58.2%, 29% and 23.6%, respectively. Using multiple logistic regression, child age ($p<0.050$), family history of febrile seizures ($p=0.027$), family history of epilepsy ($p=0.045$), and length of stay in the ward ($p=0.041$) were found to be significantly associated with anxiety when adjusted for other variables. Otherwise, for depression and stress, no significant associated variables were found when adjusted for other variables.

Conclusion: Anxiety was highly reported by participants when their children were admitted for febrile seizures. Several factors impacted their anxiety, including the lower the child's age, participants with no family history of febrile seizures before, and the longer duration of hospital

stay. Therefore, further study and intervention on reducing the parent's anxiety could be emphasized in the future.

Keywords: Febrile seizures, depression, anxiety, stress, parents

CHAPTER 1

INTRODUCTION

1.1. Febrile seizure: prevalence and risk factor

Febrile seizures are the most frequent seizure disorder among pediatric populations (1). According to the International League against Epilepsy (ILAE), a febrile seizure is a seizure occurring in association with a febrile illness in the absence of a central nervous system infection or an acute electrolyte imbalance in children older than 1 month of age without prior afebrile seizures (2).

Based on the study, it has been reported that 1 in every 25 children among the general population will experience a febrile seizure once in their lifetime (3). In the United States and Western Europe, the prevalence of febrile seizures was 2% and 4% respectively (4). Similarly in North America, 2% to 5% of children will encounter at least one episode of febrile seizures (1). A higher prevalence i.e. around 8-11 % was reported among children in East Asia (5). This was followed by a recent population-based cohort study conducted among children born at different gestational age in Japan. It was revealed that the prevalence of febrile seizure was 9.0% (8.8%–9.2%), 10.5% (9.5%–11.5%), 11.8% (9.7%–14.5%) and 11.2% (6.9%–17.7%) in children born at 37–41, 34–36, 28–33 and 22–27 gestational weeks, respectively (6). The study concluded that even though the very preterm baby may contribute to the risk of febrile seizure (6). Contrastingly, the prevalence of febrile seizure was low in Bombay, India which was around 1.8% and this was probably due to

under reported (7). Unfortunately, a detailed prevalence study is yet to be conducted in Malaysia (8). The differences in the geographical setting can be contributed by many factors for example the genetic differences (6). In addition, several studies demonstrated that environmental risk factors have also been contributing to the prevalence of febrile seizure (9).

Majority of febrile seizures occur in patients around 6 months to 3 years of age with the utmost at 18 months (10). Based on a case-control study done in New Jersey the male to female ratio is 1.4:1 (11). Another case-control population-based study had identified four factors that were associated with an increased risk for febrile seizure (12). They include first or second-degree relatives with febrile seizures, neonatal nursery stay for more than 30 days, developmental delay, and attendance at daycare. The presence of at least two out of four risk factors predisposes children to 28% risk of febrile seizure. In addition, when a patient is diagnosed to have a febrile seizure, around 10% of his siblings and 10% of his offspring may be affected (11). Apart from that, the presence of iron-deficiency anemia is the risk factor for the first febrile seizure episode (13).

About one-third of children with febrile seizures will experience an episode of recurrence and around 10% will have three or more febrile seizures (4). Most common risk factors are positive family history of febrile seizures and the onset of the first seizure episode is less than 18 months of age (4). Besides, the peak of body temperature and the duration of fever before the seizure occurred were another identified risks for recurrence febrile seizure (14). Hypothetically, the higher the peak temperature, the lower the possibility of recurrence. The study showed that patients with a peak temperature of 38.3 degree Celsius had a 42% risk of recurrence at 1 year when compared to 29% risk in patients with a peak temperature of 39.4 degrees Celsius and the risk dropped to 12% in patients with temperature more than 40.5 degree Celsius (15) (14). On the other hand, the shorter the duration of established fever, the higher the risk of recurrence. The recurrence

risk at 1 year in patients who developed seizures within an hour of the onset of fever was 46% compared to 25% risk in patients with 1 to 24 hours fever duration and 15% risk in patients with fever more than 24 hours before the onset of febrile seizure.

1.2. Classification and diagnosis

Febrile seizures are divided into two subgroups i.e. simple and complex. Simple febrile seizures is characterized by generalized tonic-clonic seizures, isolated, short duration lasting less than 15 minutes and does not recur within 24 hours. On the other hand, complex febrile seizures is classified in the presence of either 1) the duration of seizures of more than 15 minutes; or 2) recurrence within 24 hours; or 3) focal; or 4) have post-ictal paralysis (16).

Despite its benign nature, febrile seizures are one of the most common admissions to pediatric emergencies worldwide (17). They are frightening experiences to the parents. To observe their child having seizures is a terrifying experiences for many parents (18). Most parents believed that their children might die because of febrile seizures (19). This situation may also cause severe anxiety and worsening panic conditions in parents who think that their children may die and suffer from brain damage if they survive (20) (21). The event may be followed by restrictions on the quality of family life and parents may suffer a prolonged anxiety and insecurity whenever their children develop fever (22). Therefore, the best medicine for febrile seizures is an effective communication between parents and healthcare providers (23).

To date, a physiological distress especially depression is on increasing trend worldwide. The prevalence varied from region to region as well from one country to another. It may cause a regression in the individual function, quality of life, and pose an economic burden to the individual,

family and country as a whole (24). According to National Health and Morbidity Survey Malaysia 2019, the prevalence of depression among adults in Malaysian was 2.3% (25). Depression is the commonest mental illness in adults, and it is frequently co-existed with anxiety and stress (24). Besides, depression is an important risk factor to the global burden of disease and it can affect any people in all communities. World Health Organization has defined depression as a common mental disorder that is manifested by mood depression, loss of pleasure or interest, the decline in energy, feelings of guilt or low self-worth, disturbed sleep or appetite, and poor concentration (26). A study conducted among Malaysian young adults showed that depression was significantly associated with suicidal ideation (27).

Anxiety is a normal response to a threatening or challenging environment. It is the most common psychological reaction to stress and frustration in the daily activity of life. However, it can escalate to anxiety disorder when it involves an excessive fear or worrying about the future and affects the daily function (28). In Malaysia, the prevalence of anxiety disorder based on a study conducted in Selangor was 8.2% (29). In contrast, about 1 in 50 people in East Asia were been diagnosed with anxiety disorder in 2010 (30). Apart from that, there is a consistent relation between severe anxieties among parents whose child suffers from febrile seizure (22). From the data above, the psychological functioning is a very crucial aspect of maintaining a healthy and balanced nation.

1.3. Rationale of Study

Children are dependent and in the custody of their parents. Therefore, the objective of this study was to assess the psychological functioning in parents of children admitted for febrile seizures. Apart from that, this study aimed to assess the relationship between psychological functioning

among parents of febrile seizure with their sociodemographic status and clinical characteristics of their child with a febrile seizure.

Literature has proven that febrile seizures can cause severe anxiety and panic situations to the parents (31). The event may be followed by restrictions on the quality of family life and parents might suffer anxiety and insecurity for a long period whenever their child subsequently develops a fever (22). However, the prevalence rate of depression varies depending on the local population and also from geographical perspective (32). Thus due to differences in the prevalence of data across countries and cultures, this study is essential to get an overview of the local data regarding the demographic factors and the clinical factors that can affect the psychological functioning among parents of febrile seizure patients. While the identification of the associated risk factors that affect psychological aspects, it will help the managing doctor to give the appropriate information to the parents. In addition, the best medicine for febrile seizure is not medicine prescriptions but effective communication between parents and healthcare providers (23).

Besides, due to limited data in Malaysia, this study can provide local epidemiological data about the association between psychological functioning among parents with their demographic factors and clinical factors of their children with febrile seizures.

Apart from that, this study also can be used to screen for the psychological impaired among parents of children with febrile seizure. Thus, early referral and interventions can be done in the future.

CHAPTER 2

OBJECTIVE

2.1. General Objective:

To determine the psychological functioning in parents of children with febrile seizures admitted in Paediatric ward Hospital Universiti Sains Malaysia and associated factors.

2.2. Specific Objectives:

I. To measure the prevalence of psychological functioning among parents of children with febrile seizures.

II. To determine the association between the psychological functioning among parents of febrile seizures patients with parental socio demographic status.

III. To determine the association between the psychological functioning in parents of febrile seizures patients with selected clinical characteristics of children with febrile seizures.

**All objectives have been covered in the manuscript; (Chapter 4)

CHAPTER 3

STUDY PROTOCOL

3.1. Full Study Protocol

Research title: Psychological functioning in parents of children being admitted for febrile seizures in Hospital Universiti Sains Malaysia

Principal investigator **:** DR MUHAMMAD AMIRO RASHEEQ BIN MOHD RADZI (MPM: 70800)

Co-researchers **:**

Main Supervisor **:** Prof Madya Dr Salmi binti Abd Razak (MPM: 30493)

Co- Supervisors **:** 1) Prof Madya Dr Azizah binti Othman

2) Prof Madya Dr Ariffin bin Nasir (MPM: 31850)

Introduction

Febrile seizures are the most common convulsive disorder in children (1). It has been reported that 1 in every 25 children in the general population will experience febrile seizure at least once during their childhood (2).

According to the International League against Epilepsy (ILAE), febrile seizure is a seizure occurring 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 (3).

Febrile seizures are divided into two subgroups: simple febrile seizures consist of generalized tonic-clonic seizure lasting less than 15 minutes which does not recur within 24 hours, and complex febrile seizures which last longer than 15 minutes or recur within 24 hours or are focal or have post ictal paralysis (4).

Despite its benign nature, febrile convulsions are one of the most common reasons for admission to paediatric emergencies worldwide (1).

Febrile seizures also are frightening experiences to the parents. Many parents think that their child might die because of febrile seizure (5). The event may be followed by restrictions on the quality of family life and parents might suffer anxiety and insecurity for a long period whenever their child subsequently develops a fever (6). The best medicine for FS is not medicine prescriptions but effective communication between parents and healthcare providers (7).

Problem statement & Study rationale

Literature has proven that febrile seizures can cause severe anxiety and panic situations to the parents (8). The event may be followed by restrictions on the quality of family life and parents might suffer anxiety and insecurity for a long period whenever their child subsequently develops a fever (6). However, the prevalence rate of depression varies depending on the local population and also from geographical perspective (9). Thus due to differences in the prevalence of data across countries and cultures, this study is essential to get an overview of the local data regarding the demographic factors and the clinical factors that can affect the psychological functioning among parents of febrile seizure patients. While the identification of the associated risk factors that affect psychological aspects, it will help the managing doctor to give the appropriate information to the parents. In addition, the best medicine for febrile seizures is not medicine prescriptions but effective communication between parents and healthcare providers (7).

Besides, due to limited data in Malaysia, this study can provide local epidemiological data about the association between psychological functioning among parents with their demographic factors and clinical factors of their children with febrile seizures.

Apart from that, this study also can be used to screen for the psychological impaired among parents of children with febrile seizures. Thus, early referral and interventions can be done in the future.

Research Question(s)

I. What are the psychological functioning among parents of children with febrile seizures?

II. What is the relationship between psychological functioning among parents of febrile seizures children with their sociodemographic status?

III. What is the relationship between psychological functioning among parents with selected clinical characteristics in their children with febrile seizures?

Hypothesis

There is an association between parents' sociodemographic and clinical characteristics of children with febrile seizures with parents' psychological functioning.

Objective

General:

To determine the psychological functioning in parents of children with febrile seizures admitted in Paediatric ward Hospital Universiti Sains Malaysia and associated factors.

Specific:

I. To measure the prevalence of psychological functioning among parents of children with febrile seizures.

II. To determine the association between the psychological functioning among parents of febrile seizures patients with parental socio demographic status.

III. To determine the association between the psychological functioning in parents of febrile seizures patients with selected clinical characteristics of children with febrile seizures.

Literature review

	Study Design	**Duration**	**(n)**	**Outcome**
Parental thoughts and actions regarding their child's first febrile seizure Hideaki K, Fumikazu Sano, Sonoko	Cross-sectional study	April 2001 to March 2006	84	• Parents without prior knowledge of FS showed a **higher rate of thinking** that FS were **harmful** than parents with prior knowledge (P<0.03)

Mizorogi, Kanji Sugita, Masao Aihara Official Journal of the Japan Pediatric Society, 2013				• Parents with prior knowledge **were aware** that their child was having FS at a higher rate than parents without prior knowledge (P<0.001) • Moreover, parents without prior knowledge managed the convulsions **less appropriately** than parents with prior knowledge (P<0.03)

Conclusions: Parental fears that the death of their child was imminent and the misperception of FS as a serious, life-threatening condition indicate a lack of knowledge regarding FS. Organizing parental support groups and effective educational intervention program for parents should be given priority in the care of children with FS.

	Study Design	**Duration**	**(n)**	**Outcome**
Febrile seizures and parental anxiety: Does information help?	Cross-sectional study	April 1995 December 1999	135	• Febrile seizures are unknown to 44% of parents

Tanja Flury, Christine Aebi, Filippo Donati Children's Hospital Wildermeth, Biel Department of Neurology, University Hospital, Switzerland Swiss Med Wkly 2001				• 121 parents (91%) reported severe anxiety on witnessing first febrile seizure • In 69% the **anxiety was so strong**, that the parents believed their child would die • Severe anxiety was significantly associated with lack of knowledge about febrile seizures • The level of anxiety appeared to be associated with **low educational level** but not with ethnic background or income

Conclusions: There is an association between severe anxiety and lack of knowledge on febrile seizures. Although some parents knew about febrile seizures, they still had very high anxiety levels. Thus, the information provided to parents must be specific, especially about which measures are to be taken or avoided respectively.

	Study Design	**Duration**	**(n)**	**Outcome**
Parental reactions to febrile seizures in Malaysian children CT Deng HI Zulkifli B H O Azizi Med J Malaysia Vol 51 no 4 Dec 1996	A prospective study in which the parents of consecutive children admitted for febrile seizure in pediatrics wards of UKM. Study was conducted over 9 months.	August 1990 to April 1991	117	• In 88.9% of the cases, the adult present at the seizure usually the mother • Most of the parents 66.7% did tepid sponging to bring the fever down. Over half of the parents brought the child to private clinic first before bringing to the hospital • In 92 (78.6%) parents, they answered that the seizure was caused by fever • There were a small number of (6.0%) who believed that it was caused by **'spirits'** or **'ghosts'**