Indonesian Journal of Global Health Research
Volume 7 Number 3, June 2025
e-ISSN 2715-1972; p-ISSN 2714-9749
http://jurnal.globalhealthsciencegroup.com/index.php/IJGHR

MATERNAL FACTORS IN MANAGING SEIZURES IN CHILDREN

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ABSTRACT
Febrile seizures are medical emergencies commonly occurring in children aged 6 months to 5 years that require immediate and appropriate response. Maternal knowledge plays a critical role in managing these events to prevent complications.Objective : This study aims to examine the relationship between maternal knowledge, education, occupation, and age with the management of febrile seizures in children at Mitra Plumbon Hospital. A quantitative research design with a cross-sectional approach was used. A total of 84 mothers whose children experienced febrile seizures were selected through total sampling. A validated structured questionnaire was used as the instrument. The questionnaire underwent validity and reliability testing on a sample of 10 mothers to ensure its appropriateness for the study. Data were analyzed using the Spearman Rank test and ordinal regression.Result : The results showed that 45.2% of mothers had good knowledge and 47.6% demonstrated appropriate seizure management. Significant relationships were found between knowledge ($r = 0.567$; $p < 0.001$) and education ($r = 0.287$; $p = 0.008$) with seizure management. Age and occupation showed no significant correlation.Conclusion : It is concluded that maternal knowledge and education significantly influence the proper management of febrile seizures. Continuous health education for mothers is essential to improve emergency handling of febrile seizures at home.

Keywords: children; education; febrile seizures; maternal knowledge; seizure management

How to cite (in APA style)
Purbasari, D. (2025). Maternal Factors in Managing Seizures in Children. Indonesian Journal of Global Health Research, 7(3), 889-898. https://doi.org/10.37287/ijghr.v7i3.6265.

INTRODUCTION

Febrile seizures are the most common type of convulsions in children, occurring typically between the ages of 6 months and 5 years, and are often triggered by a rapid rise in body temperature without evidence of central nervous system infections (Smith et al., 2019). These seizures usually peak between 12 and 18 months of age and are generally considered benign. However, when not managed properly, febrile seizures can lead to severe complications such as physical injuries, status epilepticus, or long-term psychological disturbances affecting both children and their caregivers (Karakis et al., 2025).According to the World Health Organization (WHO), febrile seizures affect approximately 2–5% of children globally, with a higher incidence in developing countries, including Indonesia. In 2017, the prevalence of febrile seizures in Indonesia was reported at 17.4%, increasing to 22.2% in 2018 (Sawaf et al., 2023). These figures suggest an upward trend, emphasizing the need for enhanced preventive and management strategies. Unfortunately, there is currently no comprehensive national surveillance system to monitor the true incidence of febrile seizures in Indonesia, with most available data being limited to hospital-based records (Anisa & Nova Handayani, 2023).

At the local level, Mitra Plumbon Hospital has recorded a consistent burden of febrile seizure cases in pediatric patients. In 2021, there were 454 cases documented, which increased by 51.9% to 690 cases in 2022. This figure slightly declined by 9.9% in 2023 to 622 cases. These fluctuations highlight the urgency of implementing better control measures and improving community awareness (Laino et al., 2018). When appropriately managed, febrile seizures generally have a favorable prognosis. Neurological and cognitive development usually

progresses normally in children without pre-existing health conditions (Corsello et al., 2024). Nonetheless, prolonged or recurrent febrile seizures can result in complications, including cognitive impairments and the development of epileptic syndromes. Research has shown that prolonged febrile seizures may impair recognition memory, which reinforces the importance of timely seizure management (Ikatan Dokter Anak Indonesia, 2016In emergency situations, the caregiver's response most often the mother's is critical. Mothers are typically the first individuals to witness and respond to a child's seizure episode. Their knowledge and awareness of febrile seizures play a significant role in determining the effectiveness of first aid interventions and may directly impact the child's prognosis (Paizer et al., 2023). Rapid and appropriate management of febrile seizures can significantly reduce the risk of complications (Siagian et al., 2018).

Several studies indicate that maternal knowledge has a direct influence on the quality of seizure management. Mothers who are well-informed are more likely to administer appropriate first-aid actions such as placing the child on their side, loosening clothing, and avoiding harmful practices like force-feeding or shaking the child (Sirait et al., 2021). In contrast, inadequate knowledge may lead to inappropriate responses. A local survey involving 100 mothers of children with febrile seizures revealed that only 40% had accurate knowledge of proper seizure management techniques, while the majority relied on antipyretics or traditional remedies not aligned with clinical recommendations (Sartika, 2024).Furthermore, maternal attitudes and levels of anxiety significantly affect decision-making. Field observations suggest that mothers with heightened anxiety tend to seek medical assistance immediately, even when seizures are brief and self-limiting. Conversely, mothers who are calmer or less informed often delay seeking care due to underestimating the severity of the condition, concerns about medical costs, or accessibility issues (Putri et al., 2023). This delayed response can increase the duration of the seizure and the risk of complications.

Cultural beliefs and traditional practices also influence seizure management(Siagian et al., 2018). In some communities, febrile seizures are still viewed as conditions treatable by traditional methods such as herbal remedies or spiritual healing. Interviews with mothers around Mitra Plumbon Hospital revealed that approximately 30% preferred consulting traditional healers before seeking professional medical care. These practices pose a significant challenge for healthcare providers who must work to promote evidence-based medical responses in communities where traditional beliefs persistThese findings underline the existing gap in maternal knowledge and the urgent need for comprehensive education strategies(Eltrikanawati & Febrina, 2022). Despite having sufficient medical facilities, the main issue at Mitra Plumbon Hospital lies in the lack of maternal preparedness and understanding regarding febrile seizure management. This knowledge gap is compounded by socio-economic disparities and limited access to health services, which hinder timely hospital visits even when symptoms are recognized.

Therefore, this study aims to analyze maternal factors—including knowledge, education, occupation, and age—in relation to the management of febrile seizures in children treated at Mitra Plumbon Hospital. By identifying the specific barriers and facilitators to appropriate maternal responses, this research intends to provide targeted recommendations for health education interventions. Ultimately, the study seeks to improve pediatric seizure outcomes, reduce maternal anxiety, and contribute to the development of community-based health promotion strategies.

METHOD

This study employed a quantitative research design with a cross-sectional approach to analyze maternal factors influencing the management of febrile seizures in children. A quantitative

design was chosen to enable the objective measurement and statistical analysis of variables such as maternal knowledge, education, occupation, and age. The researchers do to identify associations between maternal characteristics and seizure management practices without manipulating any variables. This design is particularly suitable for understanding current conditions and relationships among variables within a defined population.

Population and Sample

The population of this study consisted of mothers whose children experienced febrile seizures and received treatment at Mitra Plumbon Hospital during the specified period. The total sample size was 84 respondents, selected using the total sampling technique. This approach involved including all mothers who met the inclusion criteria during the study period(Pandey & Pandey, 2015). The inclusion criteria were: mothers of children aged 6 months to 5 years who had experienced at least one febrile seizure, and mothers who provided informed consent to participate in the study. The exclusion criteria were: mothers who could not provide consent or were unavailable during the study, and mothers whose children had a history of neurological disorders or epilepsy before the febrile seizure event.

Data Collection

Data were collected using a structured questionnaire that was pre-tested for validity and reliability(Creswell & Creswell, 2018). This questionnaire was designed to gather information about maternal knowledge, attitudes, and practices related to the management of febrile seizures. The instrument consisted of several sections, including demographic information (such as age, education level, and socio-economic status), maternal knowledge regarding febrile seizures, and the management steps taken during a seizure. The questionnaire also assessed whether mothers followed the guidelines set by the Indonesian Pediatric Society (IDAI) for managing febrile seizures. The questionnaire was piloted on a sample of 10 mothers to ensure its clarity and reliability(Ferretti et al., 2024). The final instrument showed strong internal consistency, with a Cronbach’s alpha value of 0.85, indicating that it was a reliable tool for data collection.

Maternal Knowledge Assessment

Maternal knowledge regarding febrile seizures was assessed by asking mothers about the causes, signs, and immediate steps to take during a seizure, as well as when to seek medical intervention(Bustomi et al., 2019). Based on their responses, the mothers were categorized into three levels of knowledge: "Good," "Moderate," and "Poor." The scoring system awarded one point for each correct answer and zero points for incorrect answers. Mothers who scored high on the questionnaire, demonstrating a clear understanding of the condition and its management, were classified as having "Good" knowledge. Those who displayed a basic understanding but lacked detailed knowledge were classified as having "Moderate" knowledge. Mothers with little to no knowledge of febrile seizures were categorized as having "Poor" knowledge.

Management Practices Evaluation

The management practices of mothers were evaluated based on their adherence to the IDAI guidelines for managing febrile seizures(Ikatan Dokter Anak Indonesia, 2016). The guidelines recommend several key practices, such as ensuring the child’s safety by preventing injury during a seizure, positioning the child on their side or back with the head slightly elevated, and avoiding the use of physical restraint or placing objects in the child’s mouth. Mothers who followed these recommended practices were categorized as having "Appropriate Management," while those who deviated from the guidelines were categorized as having "Inappropriate Management." This evaluation allowed for a clear distinction between mothers

who managed the febrile seizure effectively and those who used incorrect methods, such as applying cold water to the child or delaying medical intervention(Girianto & Fuadah, 2024).

Data Analysis

The collected data were analyzed using statistical methods to examine relationships and identify predictive factors(Tong et al., 2022). To assess the relationship between maternal characteristics (e.g., education level, socio-economic status, and maternal age) and the management of febrile seizures, Spearman's Rank correlation test was used. This test was chosen because the data were ordinal and non-parametric. Additionally, ordinal regression analysis was applied to identify factors that predicted the likelihood of mothers engaging in appropriate management practices. Ordinal regression allowed for the identification of multiple factors that simultaneously influenced maternal decision-making(Goundar, 2012).

Materials and Equipment

The primary materials used for this study included the structured questionnaire for data collection, as well as pen and paper for recording responses(Garg, 2016). A digital device, such as a laptop, was used to input the collected data into Excel for further processing. These materials and tools were essential for ensuring the collection of reliable data and for conducting the statistical analyses required for this study.

Ethical Considerations

Ethical approval for the study was granted by the ethical review board of Mitra Plumbon Hospital. Before participating in the study, all respondents provided informed consent, and they were informed that their participation was voluntary and that they could withdraw at any time without any consequences(W.Creswell, 2019). Confidentiality was maintained throughout the research process by anonymizing the data, and no personal identifying information was recorded. Participants were assured that the information provided would be used solely for the purposes of this research, in line with ethical standards for research involving human subjects..

RESULT

Table 1.

This section presents the results of the univariate analysis for all variables included in the study.

Variable		f	%
Seizure Management	Inappropriate Management	30	35.7
	Appropriate Management	54	64.3
Knowledge	Poor	16	19.0
	Moderate	30	35.7
	Good	38	45.2
Education	SD	24	28.6
	SMP	16	19.0
	SMA/SMK	36	42.9
	S1	8	9.5
Occupation	Educational Services	4	4.8
	Housewife	64	76.2
	Trade	8	9.5
	Corporate Services	6	7.1
	Health Services	2	2.4
Mother's age	Young	14	16.7
	Adult	50	59.5
	Middle-aged	20	23.8

Out of 84 respondents, the majority demonstrated appropriate febrile seizure management (47.6%) and possessed good knowledge regarding febrile seizures (45.2%). Most of the

mothers had completed senior high school (SMA/SMK) education (42.9%) and were homemakers (76.2%). In terms of age distribution, the respondents were predominantly adults (aged 26–45 years), comprising 59.5% of the sample.Overall, the findings suggest that the majority of mothers had a moderate educational background, were not engaged in formal employment, and showed relatively adequate knowledge and practices related to febrile seizure management.

Table 2.
Bivariate analysis showing the relationship between maternal age, education level, occupation, and knowledge with the appropriateness of febrile seizure management.

Variabel	r (Korelasi Spearman)	p-value	Description
Mother's age	-0.174	0.113	Not significant
Education	0.287	0.008	Significant
Occupation	0.004	0.968	Not significant
Knowledge	0.567	< 0.001	Significant

Further analysis revealed a statistically significant positive correlation between maternal knowledge and febrile seizure management (r = 0.567; $p < 0.001$), indicating that higher levels of knowledge were associated with more appropriate management practices. Education level also demonstrated a significant positive relationship with seizure management (r = 0.287; $p = 0.008$), suggesting that mothers with higher educational attainment tended to manage febrile seizures more effectively. Conversely, maternal age and occupation were not significantly associated with seizure management. Age showed a weak negative correlation (r = -0.174; $p = 0.113$), while occupation had a near-zero correlation (r = 0.004; $p = 0.968$). These results suggest that neither age nor employment status plays a dominant role in influencing a mother's ability to manage febrile seizures appropriately. These findings are summarized in Table 2, which presents the correlation coefficients and significance values for each variable in relation to seizure management outcomes.

Table 3.
Ordinal Regression Multivariate Results

Variable	Coefficient (B)	Standard Error	p-value	Interpretation
Mother's Age	-0.379	0.182	0.038	Significant (negative association)
Education	0.395	0.192	0.040	Significant (positive association)
Occupation	0.066	0.218	0.757	Not significant
Knowledge	0.760	0.220	0.001	Highly significant

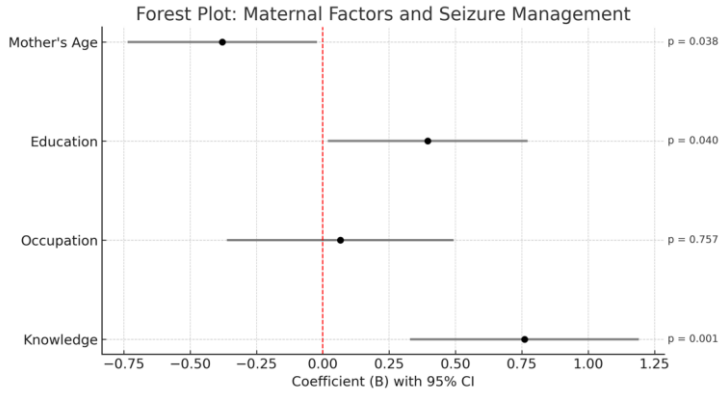

Chart 1. Forest Plot From Multivariat Analisys

The findings of the ordinal regression analysis indicate that maternal knowledge exerts the most substantial and statistically significant influence on the appropriateness of treatment received (*B = 0.760; p = 0.001*). This suggests that higher levels of knowledge among mothers are strongly associated with an increased likelihood of receiving appropriate care. Education also demonstrated a statistically significant positive relationship with treatment outcomes (*B = 0.395; p = 0.040*), implying that maternal educational attainment plays a

critical role in facilitating access to or utilization of appropriate health services. Conversely, maternal age exhibited a significant negative association with treatment (*B = -0.379; p = 0.038*), indicating that younger mothers are more likely to receive appropriate care compared to their older counterparts. In contrast, occupational status did not show a statistically significant effect (*B = 0.066; p = 0.757*), suggesting that employment may not be a key determinant of treatment quality within this sample. Collectively, these results underscore the importance of enhancing maternal knowledge and education as strategic priorities in efforts to improve the quality of maternal and child health services.

DISCUSSION

The ordinal regression model revealed that maternal knowledge (*B = 0.760; p = 0.001*) and education (*B = 0.395; p = 0.040*) significantly predicted better seizure management. Maternal age, while not significant in the bivariate analysis, showed a negative relationship in the multivariate model (*B = -0.379; p = 0.038*), suggesting that younger mothers were more likely to apply proper management practices. Maternal occupation did not show a significant influence (*B = 0.066; p = 0.757*). These results suggest that informational and educational aspects are more influential than occupational or age-related factors.

Maternal Knowledge and Seizure Management

Maternal knowledge was the strongest predictor of appropriate seizure management, as indicated by a significant regression coefficient (*B = 0.760; p = 0.001*). This highlights the critical role of maternal understanding in recognizing seizure symptoms, applying safe positioning techniques (such as the recovery position), maintaining airway patency, and avoiding harmful practices such as inserting objects into the child's mouth or giving oral fluids during a seizure. These findings are consistent with other research, who observed that mothers with higher knowledge levels performed significantly better in first aid management for seizures. Their study emphasized the effectiveness of health education in improving maternal responses to emergency conditions. Mothers who have received seizure education demonstrated significantly better handling of febrile seizure episodes(Nur, 2024). Knowledge empowers caregivers to make informed decisions under pressure, demonstrating that education campaigns focused on seizure first aid can have a tangible impact on child health outcomes.

Educational Attainment and Seizure Management

Maternal education level also significantly predicted seizure management practices (*B = 0.395; p = 0.040*). Mothers who had completed senior high school or higher were more likely to implement appropriate management strategies. Education enhances cognitive skills, increases access to reliable information, and fosters greater health literacy, which are all critical during emergency events. This finding aligns with Sitorus et al., (2022), who noted that mothers with higher education were better able to interpret health advice and apply correct practices during febrile seizures. Higher educational attainment improves mothers' capacity to interpret and implement medical guidance. It is essential that seizure education materials be tailored to accommodate various educational levels. Visual guides, simple language, and scenario-based demonstrations can bridge literacy gaps and ensure comprehension. The educational background of the family, particularly the parents, plays a crucial role in the management of seizures. As the primary support system, the family is responsible for providing initial assistance and ongoing care for children with a history of seizures. Parental education significantly influences their ability to recognize symptoms, respond appropriately during seizure episodes, and seek timely medical attention(kasmad et al., 2021; D. E. Marisa, 2018).

Maternal Occupation and Seizure Management

Surprisingly, maternal occupation was not identified as a significant predictor in the multivariate analysis (B = 0.066; p = 0.757), even though the majority of respondents (76.2%) reported being housewives. This indicates that a mother's employment status does not significantly influence her ability to appropriately manage febrile seizures in children. This finding may seem counterintuitive, as employed mothers are often assumed to have greater access to information and social networks that may facilitate better health-related decision-making. However, the results of this study suggest that occupation alone is not a sufficient determinant of seizure management competence. Similar conclusions were drawn by Eilbert & Chan, (2022), who reported that maternal work status, when not paired with targeted health education, does not automatically translate into better readiness or response in medical emergencies involving children. Likewise, Kopsidas et al., (2023) emphasized that knowledge, awareness, and exposure to health promotion materials are far more impactful factors than whether a mother is employed or not. These findings reinforce the understanding that health literacy and practical knowledge are critical determinants of appropriate caregiving behavior during seizure episodes.

Importantly, non-working mothers, particularly housewives, often serve as the primary caregivers and are most likely to be present during emergency situations such as febrile seizures. Therefore, it is vital that they are not overlooked in health education efforts(Fadiyah et al., 2020). Community-based interventions, maternal support groups, and targeted counseling during routine child health visits should be designed to reach housewives just as effectively as employed mothers. Public health messaging must also acknowledge the caregiving role of housewives and ensure equitable access to accurate and actionable health information. By focusing on knowledge dissemination rather than occupation status, healthcare systems can empower all mothers to respond competently and confidently to seizure events, thereby improving outcomes for affected children.

Maternal Age and Seizure Management

While maternal age was not significantly correlated with seizure management in the bivariate analysis (r = -0.174; p = 0.113), the multivariate analysis revealed a significant negative relationship (B = -0.379; p = 0.038). This finding indicates that younger mothers were more likely to manage febrile seizures appropriately compared to older mothers. One possible explanation for this outcome is that younger mothers tend to be more engaged with modern sources of health information, including social media, digital health platforms, and mobile applications. They may also have more recent exposure to health education during antenatal or postnatal care sessions, which often emphasize the importance of timely and accurate responses to pediatric emergencies.

Interestingly, previous studies, such as those by Mewasingh et al., (2020), suggest that maternal age alone is not a reliable determinant of seizure management skills, highlighting that knowledge and experience are far more impactful. Dougherty et al., (2008) further support this by stating that age is not a consistent predictor of knowledge or responsiveness in emergency pediatric care. However, the present study extends this discourse by showing that, after adjusting for confounding variables, maternal age may indirectly influence health behaviors. This may reflect generational differences in parenting practices, familiarity with technology, and engagement with healthcare services. Moreover, the role of the family as a unit cannot be overlooked. Parents, especially mothers, are the central figures in providing initial care during seizure episodes, but broader family dynamics including support from spouses, grandparents, or extended relatives also contribute to a child's overall well-being. A well-informed and cooperative family environment enhances the ability to respond effectively during emergencies (Karlina et al., 2022; D. Marisa & Syaripusin, 2020). Thus, while

maternal age is a factor, the family's collective knowledge, communication, and attitudes toward healthcare form an essential support system for children with a history of seizures.

Implications for Practice and Policy

These findings underscore the need for public health strategies that prioritize maternal knowledge and education to improve child health outcomes during febrile seizures. Hospitals and community health centers should integrate seizure management training into routine maternal health services(Faidah & Hanifah, 2023). Booklets, posters, videos, and interactive workshops can serve as effective tools for knowledge dissemination(Rivas-García et al., 2022). Moreover, outreach programs should ensure inclusivity by targeting housewives and older mothers who may lack access to digital resources or formal education. Community-based organizations, such as Posyandu and Puskesmas, offer ideal platforms to deliver consistent and culturally relevant education. Educational interventions should focus not only on what actions to take but also why these actions matter fostering deeper understanding and behavioral change(Girianto & Fuadah, 2024). This approach can significantly enhance maternal confidence and competence in managing pediatric emergencies, ultimately reducing morbidity associated with febrile seizures.

CONCLUSION

This study concludes that maternal knowledge and educational level play a pivotal role in the proper handling of febrile seizures in children, whereas maternal age and occupation do not significantly influence seizure management behaviors. These findings suggest that empowering mothers through targeted health education can lead to more effective responses during seizure episodes, independent of demographic factors. The research contributes to the field of pediatric nursing and maternal-child health by reinforcing the importance of maternal health literacy as a key determinant in managing acute childhood conditions. It also emphasizes the potential of integrating seizure first aid education into existing maternal health programs to enhance caregiving capacity at the household level. This insight lays the groundwork for future investigations into the design and long-term efficacy of maternal education strategies in improving seizure outcomes.

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