

Parents' Awareness and Management of Pediatric Patients with Dengue

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Abstract:

Dengue remains a major public health concern, particularly among children, who are more vulnerable to severe complications. This study examined parents' awareness and management of pediatric dengue cases in Central Philippines during the first quarter of 2025. Using a descriptive research design, data were gathered from 185 parents of pediatric dengue patients, selected through purposive sampling from outpatient and inpatient records. A self-made survey instrument assessed their awareness and management practices. Findings revealed that most respondents were aged 30 and older, had a high school education, and had larger household sizes, which influenced healthcare decisions. Parents' awareness of dengue risk factors was moderate, with the lowest understanding regarding the increased risk of severe dengue after prior infection. Parents' engagement in dengue management was also moderate, with minimal participation in awareness programs. Older parents demonstrated greater awareness of disease transmission, while engagement in management practices showed no significant differences based on age, education, or family size. Notably, parents' awareness did not directly influence dengue management, suggesting that external factors, such as healthcare access and medical guidance, play a more critical role. These findings highlight the need for targeted interventions to improve parents' awareness and engagement including enhanced hospital-led education programs, community-driven dengue prevention initiatives, gamified incentive systems, and policy improvements to strengthen healthcare accessibility and parents' participation in dengue management.

Keywords: Dengue management, parental awareness, pediatric dengue care

Introduction:

Nature of the Problem

Dengue remains a pressing global public health concern, particularly affecting children who are more susceptible to severe complications. Effective management hinges on early detection, appropriate medical intervention, and active community participation, with parental awareness playing a pivotal role in recognizing symptoms, providing timely care, and preventing disease transmission (Mehta & Shet, 2020). In 2024, over 14 million dengue cases and 10,000 deaths were reported globally, with 60% involving individuals aged 19 years or younger (European Centre for Disease Prevention and Control, 2024). In the Philippines, the Department of Health recorded a significant 81% increase in dengue cases—340,860 from January 1 to November 22, 2024—compared to 188,574 cases during the same period in 2023 (Villanueva, 2024). In Central Philippines alone, cases surged by 354.48%, from 1,489 in 2023 to 6,799 in 2024, with one northern city reporting that 66.35% of its 329 cases involved individuals under 18 years old (Bayoran, 2025). Although the national case fatality rate slightly declined from 0.34% in 2023 to 0.26% in 2024, the disease remains a critical threat to children's health (Ellera, 2024).

While most existing literature focuses on medical interventions and vector control strategies, there is limited research exploring the role of parents in early detection and home-based care, especially in low-resource communities. With the alarming increase in pediatric dengue cases and related deaths, particularly in Central Philippines, there is an urgent need to empower parents through targeted health interventions. Delayed symptom recognition, insufficient home management practices, and limited access to reliable health information continue to exacerbate the burden of dengue on young children. This study aims to address these gaps by emphasizing the critical role of parental involvement in managing pediatric dengue, ultimately aiding healthcare providers and local authorities in improving disease response and prevention strategies.

As a Medical Officer III and Pediatric Specialist, the researcher conducted this study, which was driven by a commitment to improving healthcare outcomes. This research recognized the critical role of parents and aimed to address gaps, enhance parents' capacity, and reduce dengue-related morbidity and mortality in the region through evidence-based interventions.

Current State of Knowledge

In 2024, dengue cases in the Americas reached a record-breaking 11.7 million, with all four virus serotypes circulating simultaneously, increasing the risk of severe disease (Pan American Health Organization, 2024). Organizations such as PAHO and the CDC emphasize the need for improved health system preparedness, early diagnosis, and region-specific vector control (Pan American Health Organization, 2024; Centers for Disease Control and Prevention, 2023). Surveillance improvements, healthcare worker training, and community engagement through educational campaigns are essential in curbing dengue transmission, particularly in high-risk areas like South America's Southern Cone, where cases have increased by over 250% compared to 2023 (World Health Organization, 2023).

Children under five are particularly vulnerable to severe dengue, which can lead to hemorrhagic shock and organ failure if not identified early (CDC, 2023; WHO, 2023). While general awareness of dengue transmission is widespread, studies show gaps in preventive behavior and symptom recognition (World Health Organization, 2023; Mayo Clinic, 2023). Parental education campaigns are crucial in promoting early medical intervention and consistent preventive practices, especially in regions with high infection rates (World Mosquito Program, 2023). Furthermore, reinfections increase the risk of severe disease, and a limited understanding of this factor delays timely medical intervention (Centers for Disease Control and Prevention, 2023).

In the Philippines, organizations like UNICEF, the Asian Development Bank, and the WHO focus on educating parents about dengue prevention, emphasizing the role of *Aedes aegypti* mosquitoes in transmission (Asian Development Bank, 2023; UNICEF Philippines, 2021; World Health Organization, 2021). Their campaigns teach preventive measures such as eliminating mosquito breeding sites, using mosquito nets, and applying repellents. The Department of Health (DOH, 2023) and Philippine Red Cross (2023) have launched community-based initiatives to promote mosquito control and symptom identification. However, adherence to preventive practices remains inconsistent, particularly due to environmental factors like poor waste management and stagnant water, which contribute to the spread of dengue (DOH, n.d.; Philippine National Dengue Task Force, 2022).

Research indicates that parental awareness of dengue symptoms is uneven, often hindering timely medical intervention. While many parents recognize fever as a primary symptom, critical signs like bleeding and vomiting are less frequently identified, which can delay healthcare-seeking behavior (Nguyen et al., 2022; Kumar & Gupta, 2020). Misconceptions about human-to-human transmission and inadequate environmental management further complicate dengue prevention efforts (Garcia & Santos, 2021; Tan et al., 2021). Moreover, studies show that while higher parental education is linked to better symptom recognition, knowledge alone does not guarantee preventive action (Chen et al., 2020; Lee, 2024).

Preventing dengue in children requires both personal measures and environmental controls. Experts recommend wearing protective clothing, using insect repellents, and sleeping under mosquito nets (Yap et al., 2021; Johns Hopkins Medicine, 2023). Community-driven initiatives, such as clean-up campaigns and school-based programs, have been shown to enhance the success of dengue prevention, particularly in urban and semi-urban areas (Gubler, 2020; Rojas et al., 2019). Parental involvement in these programs is critical, as research indicates that parents who engage in educational initiatives are more likely to adopt preventive behaviors and seek timely medical intervention (Heinrich et al., 2020; Fleming et al., 2021).

The effectiveness of dengue prevention strategies is influenced by a range of socio-economic and behavioral factors. Studies suggest that lower participation in awareness campaigns is linked to barriers such as financial constraints and cultural beliefs, especially among younger parents (PAHO, 2023; ADB, 2023). Despite the availability of preventive tools like mosquito nets, challenges related to affordability and concerns about chemicals in repellents persist (Rodriguez & Patel, 2023; Nguyen et al., 2024). Effective community-based support systems, such as peer health groups and local outreach initiatives, can improve parental engagement and behavior, ultimately contributing to long-term dengue control (Gupta et al., 2023; Wilder-Smith & Byass, 2024).

Theoretical Underpinnings

This study is grounded in Paul Slovic's Risk Perception Theory (1980) and Florence Nightingale's Environmental Theory (1860), which offer a comprehensive framework for understanding parents' awareness and management of pediatric dengue. Risk Perception Theory emphasizes that individuals' risk reactions are shaped by subjective factors such as familiarity, dread, and perceived control, which can influence parents' awareness and actions regarding dengue. Some parents may be more proactive in preventing dengue, while others may underestimate its severity based on their perception of risk. In contrast, Environmental Theory focuses on the role of environmental factors like sanitation and hygiene in disease prevention, highlighting the importance of a clean, mosquito-free environment in reducing dengue transmission. By integrating these theories, the study explores how parents' awareness and environmental actions contribute to managing and preventing pediatric dengue.

Objectives

This study aimed to determine the level of parents' awareness and level of parents' management of pediatric patients with dengue in Central Philippines during the first quarter of the Calendar Year 2025. Specifically, it sought to answer the following questions: 1) the level of parents' awareness of pediatric patients with dengue according to the area of signs and symptoms, disease transmission and risk factors; 2) the level of parents' management of pediatric patients with dengue according to the area of medical treatment, preventive measures, parental-community involvement; 3) the significant difference in the level of parents' awareness of pediatric patients with dengue when grouped and compared according to the aforementioned variables; 4) the significant difference in the level of parents' management of pediatric patients with dengue when grouped and compared according to the aforementioned variables; and 5) the significant relationship between the level of parents' awareness and the level of management of pediatric patients with dengue.

Methodology

This section presents a discussion of the research methodology used, the subjects and respondents of the study, the research instruments used, the validity and reliability of the instruments, the procedure for data gathering, and the statistical tools and procedures for data analysis.

Research Design

Given the data's nature, this study utilized a descriptive research design. This approach effectively presents information that forms the foundation for scientific decision-making, offers insights into the characteristics of individuals and objects, and enables a detailed examination of behaviors, practices, methods, and procedures. Additionally, descriptive research contributes significantly to the development of tools for data collection, such as questionnaires, tests, interviews, and observation schedules, as well as to create policies at local, national, or global levels (Calmorin, 2016). The descriptive research design is appropriate for this study as it provides a comprehensive overview of the current levels of parents' awareness and management of pediatric dengue cases. This insight recognized these areas requiring improvement in parents' care and management practices.

Study Respondents

The study involved 185 respondents out of 218 parents with pediatric patients diagnosed with dengue at the same district hospital. These respondents voluntarily participated in the survey, which was conducted over two weeks of data gathering using purposive sampling. Purposive sampling, or judgmental sampling, is a non-probability sampling method where researchers deliberately select participants based on specific characteristics or criteria relevant to the study's purpose (Etikan, Musa, & Alkassim, 2016). In the context of this study on dengue awareness and management among parents, purposive sampling ensures that data is collected from those directly responsible for managing dengue cases within their households. This approach is relevant as it enables the researcher to determine the parents' knowledge and actionable intervention insights that can inform interventions to enhance dengue awareness and management strategies in the community.

Instruments

A self-made survey questionnaire was utilized to gather data. The questionnaire is divided into two parts: Part I addresses the profile of respondents, including age, highest educational attainment, and family size. Part II consists of 42-item statements. Each key area has 7-item questions assessing parents' awareness and management of dengue, such as signs and symptoms, disease transmission, risk factors and medical treatment, preventive measures, and parental-community involvement. Responses were measured using a 5-point Likert scale rating with 5 as always, 4 as often, 3 as sometimes, 2 as rarely, and 1 as almost never. It was subjected to validity (4.82-excellent) and reliability (0.763 for the level of parents' awareness and 0.724 for the management of pediatric dengue patients which interpreted as acceptable). All of them were interpreted as worthy and good; respectively.

Data Gathering Procedure

Once the validity and reliability of the instrument had been confirmed, the researcher prepared a formal letter addressed to the Chief of the Hospital to request authorization to conduct the study. After obtaining approval, the researcher collaborated with on-duty healthcare personnel, including nurses, midwives, and medical doctors, to identify suitable respondents based on patient lists provided by the hospital's medical records department. With permission secured, the researcher distributed the questionnaire to the respondents, provided necessary instructions to ensure accurate completion, and facilitated the collection of the completed forms. The confidentiality of all collected data was safeguarded throughout the research process. The gathered data was then encoded and analyzed using SPSS software.

Data Analysis and Statistical Treatment

Objective No. 1 utilized a descriptive-analytical scheme and mean to assess the level of parents' awareness of pediatric patients with dengue when grouped according to the following areas of signs and symptoms, disease transmission, and risk factors.

Objective No. 2 also used a descriptive-analytical scheme and mean to identify the level of parents' management of pediatric patients with dengue when grouped according to the following areas: medical treatment, preventive measures, and parental-community involvement.

Objective No. 3 utilized a comparative-analytical scheme and Mann-Whitney U test to determine if there was a significant difference in the level of parents' awareness of pediatric patients with dengue when grouped and compared according to the variables.

Objective No. 4 utilized a comparative-analytical scheme and Mann-Whitney U test to determine if there is a significant difference in the level of parents' management of pediatric patients with dengue when grouped and compared according to the variables.

Objective No. 5 employed a relational-analytical scheme and Spearman Rho to determine if there is a significant relationship between the level of parents' awareness and the level of management of pediatric patients with dengue.

Ethical Consideration

The study on Parents' Awareness and Management of Pediatric Patients with Dengue at one of the district hospitals in the northern part of Central Philippines adhered to the provisions of the Data Privacy Act of 2012 (RA 10173) to ensure the protection of participants' rights and confidentiality. Informed consent was obtained from participants, clearly emphasizing voluntary participation, the right to withdraw at any time, and the assurance that participation would not affect their access to healthcare services. Data collection and storage followed strict confidentiality protocols, with all information anonymized and accessible only to authorized researchers for the purposes of the study. Participant welfare was the top priority of the study, and appropriate support services were made available as needed. Data analysis was conducted rigorously, and findings were reported in a manner that preserved the anonymity of participants. Any potential ethical concerns were promptly addressed to safeguard the integrity of the research. By following these protocols, the study upheld participants' rights, ensured the confidentiality of their personal information, and maintained compliance with ethical and legal standards throughout the research process.

Results and Discussion

This section presents, analyzes, and interprets the data that were gathered consistent with its predetermined objectives.

Table 1

Level of Parents' Awareness of Pediatric Patients with Dengue in the Area Signs and Symptoms

Items	Mean	Interpretation
As a parent, I am aware that my child may have dengue if...		
1. he/she has a high fever of more than 37.5 °C	4.79	Very High Level
2. there is a sudden drop in body temperature after having a fever below 36°C (96.8°F).	3.38	Moderate Level
3. rashes suddenly appear in different parts of his/her body	3.81	High Level
4. my son/daughter suffers from severe abdominal pain	3.52	High Level
5. if they frequently vomit or feel nauseous.	3.52	High Level
6. experiences fatigue and feels weak	3.59	High Level
7. experiences bleeding, such as nosebleeds or gum bleeding	2.71	Moderate Level
Overall Mean	3.62	High Level

Table 1 shows that parents exhibited a high level of awareness regarding the signs and symptoms of dengue in pediatric patients, with an overall mean score of 3.62. This finding implies that most parents in the study area possess substantial knowledge about dengue symptoms, which is crucial for early recognition and timely medical intervention, thereby reducing the risk of severe complications. The World Health Organization (WHO, 2023) emphasizes that early detection and proper case management are essential in preventing severe dengue and related fatalities. The highest awareness was recorded for the symptom "high fever of more than 37.5°C" (mean = 4.79), likely influenced by

widespread public health messaging and personal experience, reinforcing the finding of Chakravarti and Kumaria (2017) that fever is the most commonly recognized dengue symptom. However, Gutiérrez et al. (2020) caution that over-reliance on fever may lead to missed diagnoses, as severe dengue can present with other critical symptoms. Notably, the lowest awareness was for bleeding symptoms such as nosebleeds or gum bleeding (mean = 2.71), indicating moderate awareness and a potential gap in recognizing life-threatening complications. This is concerning since bleeding is a hallmark of severe dengue and can signal hemorrhagic shock or organ failure (WHO, 2023). To address this, the Centers for Disease Control and Prevention (2023) recommend that community health programs, digital awareness campaigns, and clinical consultations prioritize educating parents on recognizing bleeding and other severe warning signs to ensure prompt treatment and improve outcomes.

Table 2

Level of Parents' Awareness of Pediatric Patients with Dengue in the Area of Disease Transmission

Items	Mean	Interpretation
As a parent, I am aware that my child may have dengue if...		
1. the virus is transmitted through mosquito bites	4.72	Very High Level
2. the Aedes mosquito spreads explicitly the dengue virus	3.52	High Level
3. the mosquitoes that spread the virus breed in stagnant water	3.58	High Level
4. transmission can occur at any time, especially in the morning and afternoon	3.44	Moderate Level
5. mosquitoes carrying dengue virus can be found in both urban and rural areas	3.52	High Level
6. infected mosquitoes become carriers of the virus after feeding on an infected person	3.69	High Level
7. dengue disease has several serotypes (DENV-1; DENV-2; DENV-3; DENV-4)	2.35	Low Level
Overall Mean	3.55	High Level

Table 2 reveals that parents exhibit a high level of awareness regarding dengue transmission in pediatric patients, with an overall mean score of 3.55, indicating general comprehension of how the virus spreads. This contrasts with the findings of Maharaj et al. (2023), who identified notable gaps in parental awareness, suggesting that while parents in the current study show adequate attitudes and practices, their understanding is not entirely comprehensive. The highest awareness was for the item stating that "the virus is transmitted through mosquito bites" (mean = 4.72), underscoring strong parental knowledge of the primary transmission route—a crucial factor in promoting preventive actions like using mosquito repellents and eliminating breeding sites. Nevertheless, as noted by the Associated Press (2024), global dengue incidence continues to rise, highlighting that awareness alone is insufficient without sustained behavioral changes. The lowest awareness was found in understanding that dengue has multiple serotypes (mean = 2.35), an important gap since infection with one serotype does not confer immunity to others, and secondary infections increase the risk of severe illness. As emphasized by the World Mosquito Program (2023), informing parents about the four dengue serotypes is essential for encouraging long-term prevention, even after a previous infection, to reduce the chances of severe outcomes.

Table 3

Level of Parents' Awareness of Pediatric Patients with Dengue in the Area Risk Factors

Items	Mean	Interpretation
As a parent, I am aware that my child may have dengue if...		
1. he/she is under 5 and is at higher risk of severe dengue	2.66	Moderate Level
2. living in a densely populated area increases the risk of having the disease	3.40	Moderate Level
3. has a history of previous infection, which increases the risk of severe dengue	1.95	Low Level
4. weakened immune systems make children more vulnerable	3.65	High Level
5. lack of protective measures, such as mosquito repellents, increases the risk	4.12	High Level
6. failure to take preventive measures increases the likelihood of contracting dengue	3.59	High Level
7. dengue transmission is more likely during the rainy season	3.70	High Level

Overall Mean	3.30	Moderate Level
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Table 3 shows that parents possess a moderate level of awareness regarding dengue risk factors in pediatric patients, with an overall mean score of 3.30, indicating that while some risk elements are understood, knowledge gaps remain that could compromise consistent prevention efforts. The highest awareness was recorded for the item stating that "lack of protective measures, such as mosquito repellents, increases the risk" (mean = 4.12), reflecting an encouraging recognition of the value of preventive actions like using repellents, installing screens, and wearing protective clothing. However, as the Mayo Clinic (2023) noted, awareness does not always translate into sustained behavioral compliance, especially in high-risk areas. The lowest awareness was seen in recognizing that a "history of previous infection increases the risk of severe dengue" (mean = 1.95), highlighting a critical gap in understanding the elevated danger of reinfection, which can lead to life-threatening complications. According to the Centers for Disease Control and Prevention (CDC, 2023), secondary infections are a major contributor to severe dengue cases, making it essential for public health campaigns to stress the risks associated with reinfection to prompt earlier detection and medical response.

Table 4

Level of Parents' Management of Pediatric Patients with Dengue in the Area Medical Treatment

Items	Mean	Interpretation
As a parent, I am able to manage my child with dengue if...		
1. proper hydration is ensured, as it is essential in managing the disease	3.58	High Level
2. medical treatment for dengue involves symptomatic and supportive care	3.24	Moderate Level
3. analgesic and antipyretic medications should be used with caution in dengue	2.19	Low Level
4. seeking medical attention early can prevent severe complications	4.54	Very High Level
5. blood transfusions may be required for severe dengue cases	3.67	High Level
6. there is no specific antiviral treatment; hence, monitoring vital signs is essential for management	3.44	Moderate Level
7. platelet counts must be monitored to manage severe dengue	3.90	High Level
Overall Mean	3.51	High Level

Table 4 reveals that parents generally demonstrate a high level of management regarding pediatric dengue cases, with an overall mean score of 3.51, indicating strong engagement in key medical treatment practices. This aligns with Alvarez and Chen (2024), who emphasized that active parental involvement significantly enhances child health outcomes during illness. The highest score of 4.54 was for the belief that "seeking medical attention early can prevent severe complications," reflecting a very high level of awareness and reinforcing the findings of Martinez et al. (2023), who highlighted that prompt medical consultation can drastically reduce the risk of severe dengue and fatality, particularly in endemic areas. However, the lowest score of 2.19 was for the item on cautious use of analgesics and antipyretics, suggesting limited awareness of the dangers associated with medications like NSAIDs, which may cause bleeding in dengue patients. This supports the concerns raised by Chandra and Patel (2023), who noted that misconceptions about medication safety persist, especially in underserved communities, and Singh and Morales (2024), who found that limited healthcare access contributes to improper treatment practices.

Table 5

Level of Parents' Management of Pediatric Patients with Dengue in the Area Preventive Measures

Items	Mean	Interpretation
As a parent, I am able to manage my child with dengue if...		
1. use mosquito repellent to protect my child from dengue	1.79	Low Level
2. ensure that there are no stagnant water sources inside and outside the house	3.62	High Level
3. cover water containers with tight-fitting lids to prevent mosquito breeding	3.68	High Level
4. make my child wear long sleeves and pants to avoid mosquito bites	3.11	Moderate Level
5. regularly clean and change water in flower vases and containers to prevent mosquito breeding	3.71	High Level
6. properly dispose of home garbage, especially empty cans and bottles, to eliminate mosquito breeding grounds	3.75	High Level
7. use mosquito nets and screens to protect children from mosquito bites, especially while sleeping	4.19	High Level

Overall Mean	3.41	Moderate Level
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Table 5 reveals a moderate level of parental management in implementing preventive measures against pediatric dengue, with an overall mean score of 3.41, suggesting that while some practices are in place, there is considerable room for improvement. The Department of Health (2023) emphasizes that consistent application of preventive strategies, supported by community health education, is vital to reducing dengue cases. The highest mean score of 4.19 for the use of mosquito nets and screens reflects parents' strong recognition of physical barriers as effective protection, especially for young children vulnerable to severe dengue (Johns Hopkins Medicine, 2023). In contrast, the lowest score of 1.79 for using mosquito repellents highlights a low adoption rate, possibly due to safety concerns, cost, or lack of awareness. Given the effectiveness of repellents in preventing mosquito bites, addressing these barriers through affordable, accessible, and safe options could significantly improve preventive outcomes (Cleveland Clinic, 2023).

Table 6

Level of Parents' Management of Pediatric Patients with Dengue in the Area Parental-Community Involvement

Items	Mean	Interpretation
As a parent, I am able to manage my child with dengue if...		
1. actively engage in dengue awareness programs and activities in my community	2.33	Low Level
2. immediate medical help when shows symptoms of dengue	4.02	High Level
3. share information about dengue prevention with other parents in my neighborhood	3.22	Moderate Level
4. encourage the community to participate in efforts to eliminate mosquito breeding sites	2.94	Moderate Level
5. actively support initiatives by local health workers to control dengue in the community	3.02	Moderate Level
6. collaborate with my child's school to ensure dengue prevention measures are in place	2.94	Moderate Level
7. report stagnant water sources or potential mosquito breeding sites to local authorities	2.87	Moderate Level
Overall Mean	3.05	Moderate Level

Table 6 reveals a moderate level of parental involvement in community-based dengue management, with an overall mean score of 3.05, indicating limited and inconsistent engagement in collective prevention efforts. While parents demonstrate strong individual actions—reflected in the highest mean score of 4.02 for seeking immediate medical help when symptoms arise—this reactive approach suggests a focus on treatment rather than proactive community prevention (Torres et al., 2023). Research underscores that successful dengue control requires widespread community participation to eliminate breeding sites and sustain public health efforts (Gupta et al., 2023). However, the lowest mean score of 2.33 for active engagement in dengue awareness activities highlights a concerning lack of participation, often linked to limited access, minimal perceived benefits, or weak program structures (Gubler, 2023). As Ocampo and Restrepo (2023) stress, effective dengue prevention hinges on shared knowledge and unified action, making it crucial to address barriers to community involvement through targeted education and inclusive initiatives.

Table 7

Difference in the Level of Parents' Awareness of Pediatric Patients with Dengue in the Area Signs and Symptoms According to Variables

Variable	Category	N	Mean Rank	Mann Whitney U	p-value	Sig. level	Interpretation
Age	Younger	48	89.89	3138.50	0.634		Not Significant
	Older	137	94.09				
Highest Educational Attainment	Lower	102	89.12	3837.00	0.267	0.05	Not Significant
	Higher	83	97.77				
Family Size	Few	50	90.18	3234.00	0.658		Not Significant
	Many	135	94.04				

Table 7 shows no significant difference in parents' awareness of dengue signs and symptoms when grouped by age, educational attainment, and family size, indicating that these demographic factors do not substantially influence their knowledge levels. The null hypothesis stating no significant difference across these variables is accepted. Younger

and older parents had comparable awareness levels ($p=0.634$), suggesting widespread access to health information may neutralize age-related differences (Fernandez & Lee, 2024). Similarly, the difference between parents with lower and higher educational attainment was not significant ($p=0.267$), implying that public health campaigns, school initiatives, and community exposure effectively deliver dengue-related knowledge regardless of formal education (Gomez et al., 2024). Awareness was also similar between parents from small and large families ($p=0.658$), supporting the idea that health education campaigns reach households uniformly, and that exposure to information, rather than family size, drives health literacy (Nguyen & Patel, 2023).

Table 8

Difference in the Level of Parents' Awareness of Pediatric Patients with Dengue in the Area Disease Transmission According to Variables

Variable	Category	N	Mean Rank	Mann Whitney U	p-value	Sig. level	Interpretation
Age	Younger	48	69.14	2142.50	0.000		Significant
	Older	137	101.36				
Highest Educational Attainment	Lower	102	88.38	3761.50	0.186	0.05	Not Significant
	Higher	83	98.68				
Family Size	Few	50	96.55	3197.50	0.577		Not Significant
	Many	135	91.69				

Table 8 reveals that parents' awareness of dengue transmission varies significantly by age but not by educational attainment or family size, leading to the rejection of the null hypothesis for age and its acceptance for the other two variables. Older parents demonstrated significantly higher awareness (mean rank = 101.36, $p = 0.000$) compared to younger ones (mean rank = 69.14), likely due to greater life experience, repeated exposure to past outbreaks, and engagement in public health initiatives (Ramirez & Wong, 2024; Chavez et al., 2023). These findings highlight the need for age-tailored interventions, such as gamified apps and virtual simulations, to enhance younger parents' understanding. In contrast, no significant differences were found in awareness based on educational attainment ($p = 0.186$) or family size ($p = 0.577$), suggesting that formal education and number of children do not significantly affect knowledge of dengue transmission. This supports the idea that non-formal education channels—like community outreach, media, and healthcare messaging—effectively deliver critical health information across diverse backgrounds (Torres & Medina, 2023; Vargas & Liu, 2023).

Table 9

Difference in the Level of Parents' Awareness of Pediatric Patients with Dengue in the Area Risk Factors According to Variables

Variable	Category	N	Mean Rank	Mann Whitney U	p-value	Sig. level	Interpretation
Age	Younger	48	102.53	2830.50	0.147		Not Significant
	Older	137	89.66				
Highest Educational Attainment	Lower	102	100.36	3482.50	0.036	0.05	Significant
	Higher	83	83.96				
Family Size	Few	50	101.34	2958.00	0.192		Not Significant
	Many	135	89.91				

Table 9 reveals that parents' awareness of dengue risk factors does not significantly differ by age or family size but does vary based on educational attainment, leading to the acceptance of the null hypothesis for age ($p = 0.147$) and family size, and its rejection for educational attainment ($p = 0.036$). Although younger parents had a slightly higher mean rank (102.53) than older ones (89.66), the difference was not statistically significant, suggesting that factors like health campaigns and community exposure, rather than age, influence awareness (Torres et al., 2024). However, parents with lower educational attainment (mean rank = 100.36) showed significantly greater awareness of dengue risk factors than those with higher education (mean rank = 83.96). This finding contradicts the common assumption that more education equates to better health literacy. It may be that less-educated parents are more engaged in grassroots-level health efforts, receiving practical information through barangay health workers, while more educated parents may exhibit overconfidence and overlook newer guidelines. Additionally, lower-educated parents may be more exposed to actual dengue cases in their communities, which heightens their awareness (Morales et al., 2023).

Table 10

Difference in the Level of Parents' Management of Pediatric Patients with Dengue in the Area Medical Treatment According to Variables

Variable	Category	N	Mean Rank	Mann Whitney U	p-value	Sig. level	Interpretation
Age	Younger	48	82.16	2767.50	0.100		Not Significant
	Older	137	96.80				
Highest Educational Attainment	Lower	102	94.25	4105.00	0.721	0.05	Not Significant
	Higher	83	91.46				
Family Size	Few	35	95.77	2528.00	0.731		Not Significant
	Many	150	92.35				

Table 10 examines whether parents' management of pediatric dengue treatment differs by age, educational attainment, and family size, finding no significant differences across any of these variables ($p > 0.05$). Specifically, there was no significant difference between younger and older parents ($p = 0.100$), indicating that age does not significantly impact parents' ability to manage dengue treatment. This suggests that factors such as healthcare access, previous dengue experiences, and participation in public health initiatives are more influential than age. Additionally, there was no significant difference in management between parents with different education levels ($p = 0.721$), highlighting that education alone does not determine the quality of dengue treatment management. Likewise, family size did not influence management practices ($p = 0.731$), suggesting that economic stability, healthcare access, and community support play a larger role in how parents manage treatment. These findings suggest that dengue management programs should focus on broad educational strategies and accessible healthcare information, regardless of age, education, or family size (Valencia & Mercado, 2024; Rosales et al., 2023; Fernandez & De la Rosa, 2024).

Table 11

Difference in the Level of Parents' Management of Pediatric Patients with Dengue in the Area Preventive Measures According to Variables

Variable	Category	N	Mean Rank	Mann Whitney U	p-value	Sig. level	Interpretation
Age	Younger	48	80.48	2687.00	0.057		Not Significant
	Older	137	97.39				
Highest Educational Attainment	Lower	102	89.60	3886.00	0.333	0.05	Not Significant
	Higher	83	97.18				
Family Size	Few	35	83.61	2296.50	0.245		Not Significant
	Many	150	95.19				

Table 11 investigates whether parents' management of pediatric dengue prevention differs by age, educational attainment, and family size, with no significant differences found for any of the variables ($p > 0.05$). The analysis shows no significant difference between younger and older parents ($p = 0.057$), suggesting that the implementation of preventive measures is more influenced by sociocultural factors and perceived disease risk than age. Similarly, no significant difference was observed based on educational attainment ($p = 0.333$), indicating that formal education does not significantly impact preventive behaviors, and health promotion should focus on action-based messages accessible to all parents. Additionally, family size did not affect preventive management ($p = 0.245$), suggesting that factors like economic stability, community health programs, and local infrastructure play a more significant role in shaping preventive efforts. These findings highlight the importance of community-wide health initiatives and exposure to public health campaigns in fostering dengue prevention, regardless of age, education, or family size (Tanaka et al., 2023; Chowdhury et al., 2023; Larsen & Dupont, 2024).

Table 12

Difference in the Level of Parents' Management of Pediatric Patients with Dengue in the Area Parental-Community Involvement According to Variables

Variable	Category	N	Mean Rank	Mann Whitney U	p-value	Sig. level	Interpretation
Age	Younger	48	83.14	2814.50	0.135		Not Significant
	Older	137	96.46				
Highest Educational Attainment	Lower	102	88.38	3762.00	0.190	0.05	Not Significant
	Higher	83	98.67				
Family Size	Few	35	86.97	2414.00	0.456		Not Significant
	Many	150	94.41				

Table 12 examines parental-community involvement in managing pediatric dengue cases, revealing no significant differences when grouped by age, educational attainment, or family size ($p > 0.05$). The analysis shows that involvement is more influenced by access to health resources, perceived disease threat, and prior exposure to health campaigns rather than age ($p = 0.135$) or educational level ($p = 0.190$). Similarly, family size did not significantly affect engagement ($p = 0.456$), suggesting that community participation is shaped by factors such as trust in local health authorities, social cohesion, and the availability of support networks. These findings emphasize the importance of inclusive, community-driven health strategies, highlighting that social networks and local health infrastructure are more critical determinants of participation than demographic factors alone (Martinez & Rojas, 2024; Petersen & van der Meer, 2024).

Table 13

Difference Between the Level of Parents' Awareness and the Level of Management of Pediatric Patients with Dengue

Variable	rho	p-value	Sig. level	Interpretation
Awareness Management	-0.041	0.581	0.05	Not Significant

Table 13 explores the correlation between the level of parents' awareness and the level of management of pediatric patients with dengue. The null hypothesis, "There is no significant relationship between the level of parents' awareness and the level of management for pediatric patients with dengue," is accepted ($p = 0.581$, $\rho = -0.041$), indicating that no significant correlation exists between the two variables.

The absence of a significant correlation between parents' awareness and the effective management of pediatric dengue cases suggests that cognitive recognition of dengue risk factors does not inherently translate into appropriate clinical decision-making. Multiple confounding variables, including disparities in healthcare accessibility, socioeconomic limitations, psychosocial stressors, and cultural inclinations toward traditional remedies, can impede optimal disease management. Furthermore, while theoretical health literacy may be present, deficiencies in procedural knowledge, decision-making capacity during critical phases of dengue progression like recognition of warning signs such as plasma leakage or impending shock, and adherence to evidence-based interventions may hinder parents from executing timely and appropriate medical responses.

These findings highlight the need for intervention programs that go beyond awareness campaigns, focusing on behavioral training, improved healthcare access, and decision-making support to ensure proper dengue management (Ramirez & Olsen, 2024).

Conclusions

The study revealed that the majority of participants were aged 30 and older, with a high school education, which likely influences their health literacy. Larger households were common, potentially impacting resource allocation and caregiving. Parents' awareness of dengue risk factors was moderate, but gaps existed, particularly regarding the heightened risk of severe dengue after a previous infection. Parental involvement in dengue management was also moderate, with the least participation in awareness programs. Younger and older parents, as well as those from smaller and larger families, showed varying levels of awareness, with older parents demonstrating more knowledge. However, no significant differences in dengue management practices were found based on age, education, or family size. The study concluded that targeted health interventions should focus on older individuals, improve health literacy for those with lower education, and strengthen community-based programs for larger households. It emphasized that parental involvement in dengue prevention is inadequate, and systemic factors like healthcare access and community responsiveness play a critical role in effective disease management. Recommendations included enhancing dengue health interventions, implementing gamified incentive systems, launching tiered education

models, and improving community engagement through integrated networks and household visits, all supported by allocated budgets for sustained dengue prevention and management.

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