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Ricalde, MAL, Sanchez-Mostiero, DO. Determinants of Delayed Consultation in Pediatric Dengue: A Cross-Sectional Study in Batangas, Philippines
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ORIGINAL ARTICLE

DETERMINANTS OF DELAYED CONSULTATION IN PEDIATRIC DENGUE: A CROSS-SECTIONAL STUDY IN BATANGAS, PHILIPPINES

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ABSTRACT

Objective: Dengue remains a critical public health concern in the Philippines. Late consultation and delayed presentation of dengue patients to hospitals constantly challenge doctors. This study aimed to identify factors contributing to late consultation of dengue patients.

Methodology: This analytic, cross-sectional study examined patient, parental, socioeconomic, cultural, and health system factors influencing delayed consultation among parents of patients 0 - 18 years at Batangas Medical Center and Lipa Medix Medical Center. A total of 668 parents were enrolled. Descriptive statistics and frequency tables summarized the key characteristics. Test of proportions assessed differences between groups. Univariate logistic regression screened possible predictors, followed by multiple logistic regression to identify significant factors.

Results: Univariate analysis identified significant predictors of late consultation, including older patient age ($p=0.002$), residence >50 km from the hospital ($p<0.001$), and maternal widowed status ($p=0.035$). Multiple logistic regression showed that for every additional year of patient age, the odds of late consultation increased by 7% ($p=0.015$). Private hospital patients had 51% lower odds of late consultation than public hospital patients ($p=0.03$). Parents residing >50 km from the hospital were 2.7 times more likely to consult late ($p=0.01$).

Conclusion: Delayed consultation was influenced by the patient age, hospital type, geographic distance from the hospital, maternal marital status, and cultural beliefs in home remedies and faith healing. Strategies to improve early consultation should consider these factors.

KEYWORDS: *dengue, pediatric, late consultation, health-seeking behavior, cross-sectional study*

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INTRODUCTION

Dengue is an endemic mosquito-borne viral infection in the Philippines. Unfortunately, there is no specific antiviral treatment or licensed dengue vaccine in the Philippines. Mortality is still high for severe dengue despite improvements in dengue management, infrastructure progress, availability of specialists, and diverse dengue research. However, timely consultation and patient admission are critical for reducing mortality. Late consultation and presentation of patients with dengue to the hospital or outpatient department are a constant challenge to the doctors. The Philippine government acknowledges the toll of dengue on human health, hindering development goals, economic progress, and tourism. The Department of Health has channeled the message to the barangay health centers that it is imperative to seek early consultation in health facilities for proper medical management to avoid serious complications if fever is persistent, with or without rashes. In pediatric cases, signs of dehydration are more pronounced in infants and young children than in adolescents and adults with dengue, making early consultation even more important.

In the Philippines, previous studies focused on dengue-related knowledge and preventive practices in various communities, but none investigated the causes of delayed consultation among dengue-infected patients.[1] From 2008 to 2014, Abello et al. conducted a retrospective study in Region VIII (Eastern Visayas) using secondary data from notified dengue cases to identify variables associated with the time between fever onset and admission. The study included over 16,000 cases and considered age, sex, hospital sector and level, disease severity, and the presence of an epidemic. It classified admission as early (0-2 days), regular (3-5 days), and late (6 or more days), and found significant associations between disease severity, age, hospital sector and level, period of admission, and time of admission. Late admission, severe disease, tertiary hospitals, public hospitals, and female patients had a case fatality rate of 1 or more.[2] Elsinga et al. studied the behaviors of parents and guardians with children experiencing fever. The study revealed that most parents first treated their child's fever at home, but they preferred to visit a doctor for dengue fever. Dengue fever was considered more serious, and parents took their children to the doctor sooner than other causes of fever.[3] A study on Thai individuals who had dengue between 2012 and 2013 compared patients who sought medical attention early (within 4 days of symptoms) to those who delayed seeking care (after 5 days). The study found that delayed care-seeking was associated with a higher rate of admission to the hospital, but there was no link between delayed presentation and negative outcomes such as death or complications.[4]

Our study aimed to determine the factors associated with late consultation, including parental education level, age, marital status, work, average household monthly income, government subsidy recipient status, and health beliefs. We also analyzed the correlation between the patient's biological factors (age, sex, day of illness, comorbidities, primary or secondary dengue infection), socioeconomic and cultural factors (parental age, level of education, work, income, place of residence, marital status, health beliefs, and religion), and health system factors (hospital sectors, health insurance, 4Ps, and out-of-pocket expenses).

MATERIALS AND METHODS

Study Design

This is an analytic, cross-sectional study that investigated the patient, parental, socioeconomic, cultural, and health system factors that contributed to late consultation of pediatric patients 0 - 18 years old at the Batangas Medical Center and Lipa Medix Medical Center.

Population and Sample Size

The study population consisted of parents of patients aged 0-18 years who were diagnosed with dengue fever based on the 2009 WHO dengue case definition. These parents sought consultation for their children for the first time at the Outpatient Department (OPD) or Emergency Room (ER) of Batangas Medical Center (a public hospital) or Lipa Medix Medical Center (a private hospital). Exclusion criteria included parents whose children did not meet the 2009 WHO dengue case definition, those who transferred their children from other institutions to either study site, parents whose children had prior consultations, parents under 18 years old, and those who did not give their consent to participate in the study.

The study participants consisted of 214 couples, 109 single parents, and 11 widowed parents. Single and widowed parents provided details about their partners, bringing the total participants to 334 couples or 668 individual parents. The participants were distributed as follows: 300 parents (150 children) from Batangas Medical

Center and 368 parents (184 children) from Lipa Medix Medical Center.

Assuming a power of 80%, a significance level of 0.05, a small association among factors, and a slightly strong association between the main variable of interest and outcome, the required sample size to determine which factors were significant predictors of late consultation was 636. The sample size was computed using Stata 13.0 (StataCorp LLC, 4905 Lakeway Drive, College Station, Texas, USA).

Data Collection Process

The study was done from April 2021 to December 2022. Enrollment started in April 2021 at Batangas Medical Center and in May 2021 at Lipa Medix Medical Center. Parents were grouped according to the timing of their child's consultation: those who sought consultation within 5 days of fever onset and those who consulted after 5 days. The patients themselves did not directly participate in the study; instead, data were gathered from chart reviews and interviews with the parents.

The researcher conducted chart reviews to collect information on the patient's age, sex, comorbidities, type of dengue infection (primary or secondary), place of residence, hospital sector, health insurance, and religion. Additional details such as parental education level, marital status, occupation, family income, government subsidy (4Ps) recipient, and health beliefs, were obtained through face-to-face key informant interviews with the parents.

Pretesting was done with the first 50 respondents to measure the coefficient of reliability of the 10-item health beliefs questionnaire using the Kuder-Richardson formula 20 (KR-20). Items with a reliability coefficient of 0.7 were considered acceptable for this study; hence, items number 2, 3, and 6 were suggested to be excluded from the questionnaire. To assess the construct validity, we used Bartlett's test of sphericity and the Kaiser-Meyer-Olkin Measure of Sampling Adequacy. Bartlett's Test yielded a highly significant result ($p<0.001$), leading to the rejection of the null hypothesis that the variables in the correlation matrix are uncorrelated. Although factor analysis could be considered, the KMO measure of 0.365 indicates that it is unsuitable for the variables to undergo factor analysis. Additionally, factor analysis was not pursued due to the sample size of 50 respondents, which is below the recommended minimum.

Meanwhile, to assess the known group validity in the health belief scores comparing those who consulted early (<5 days) and those who consulted late (>5 days), we conducted the Mann-Whitney test. This significant result ($p = 0.004$) rejects the null hypothesis that the median health belief scores are equal between the early and late consultation groups.

Based on the responses from the first 50 participants, three items were removed from the original 10-item questionnaire to enhance its reliability.

The interview utilized the aforementioned structured, pretested questionnaire consisting of 7 questions focused on health beliefs. The researcher recorded the responses and assured the participants that all information would remain confidential and that any decision to withhold specific details was fully respected. The interviews were conducted only after the patient had been stabilized.

In light of the COVID-19 pandemic, the respondents and the researchers strictly observed proper wearing of masks, 6-feet distance, handwashing, and wearing of appropriate personal protective equipment (PPE) depending on the area where the interview was conducted.

Statistical Analysis

Descriptive analysis was performed to summarize key characteristics of the dataset, with frequency tables used for categorical variables. A test of proportions assessed significant differences between characteristics across two or more groups, using a p-value threshold of 0.05 for significance and <0.01 for high significance.

Stepwise multiple logistic regression examined the relationship between consultation timing (early vs. late) and various predictor variables. A preliminary crude model was constructed for each predictor, computing and interpreting odds ratios to evaluate the strength and direction before selecting significant factors.

All statistical analyses were conducted using Stata13 (StataCorp LLC, 4905 Lakeway Drive, College Station, Texas, USA).

Ethical Considerations

The study adhered to the ethical considerations and principles of the Declaration of Helsinki (2013), World Health Organization guidelines, the International Conference on Harmonization-Good Clinical Practice, the Data Privacy Act of 2012, and the 2017 National Ethics Guidelines for Health and Health-related Research. The research protocol and all relevant documents were

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reviewed and approved by the Batangas Medical Center Research Ethics Review Committee (BatMC-RERC) with Protocol Number BatMC-RERC 2020-052 and approval dated March 12, 2021. The approved protocol included Lipa Medix Medical Center as one of the study sites.

While Lipa Medix Medical Center does not maintain its own independent Research Ethics Committee, ethical oversight for the conduct of the study at this site was provided by the BatMC-RERC. In addition, formal administrative permission to conduct the study at Lipa Medix was obtained from the Medical Director, the Chief of Clinics, and the Chair of the Department of Pediatrics. All participants from Lipa Medix provided written informed consent using the Informed Consent Form that was likewise approved by the BatMC-RERC. Patient confidentiality was respected by ensuring the anonymity of patient records. The investigators ensured the integrity of the data collected.

RESULTS

In this study, 668 parents participated to examine factors influencing decision-making on seeking medical consultation for their children with fever.

Table 1. Fathers' Characteristics Influencing Decision for Early or Late Consultation of their Children with Dengue

Characteristics	Early consultation ≤5 days		Late Consultation >5 days		Total		P-value*
	n	%	n	%	N	%	
Father's Age, years							0.36
15 to 20	5	2.1	0	0	5	1.5	
21 to 30	40	16.5	20	21.7	60	18	
32 to 40	114	47.1	36	39.1	150	44.9	
41 to 50	70	28.9	31	33.7	101	30.2	
Above 50	13	5.4	5	5.4	18	5.4	
Father's Educational Level							0.085
Elementary	20	8.3	11	12	31	9.3	
Highschool	98	40.5	48	52.2	146	43.7	
College	119	49.2	31	33.7	150	44.9	
Postgraduate	5	2.1	2	2.2	7	2.1	
Father's Type of Work							0.668
Health professional	8	3.3	3	3.3	11	3.3	
Education professional	6	2.5	1	1.1	7	2.1	
Legal, social, and welfare	5	2.1	2	2.2	7	2.1	
Science	-	-	-	-	-	-	
Engineering	4	1.7	0	0	4	1.2	
Information technology	3	1.2	1	1.1	4	1.2	
Business, HR, and finance	38	15.7	9	9.8	47	14.1	
Marketing, PR, sales	19	7.9	6	6.5	25	7.5	
Arts, design, and media	5	2.1	0	0	5	1.5	
Childcare, health and education	17	7	6	6.5	23	6.9	
Clerical, secretarial	14	5.8	7	7.6	21	6.3	
Retail	8	3.3	2	2.2	10	3	
Others	115	47.5	55	59.8	170	50.9	
Father's Average Monthly Income, PHP							0.438
<10,000	140	57.9	63	68.5	203	60.8	
10,000 – 20,000	45	18.6	16	17.4	61	18.3	
21,000 – 30,000	30	12.4	8	8.7	38	11.4	
31,000 – 40,000	10	4.1	1	1.1	11	3.3	
41,000 – 50,000	3	1.2	1	1.1	4	1.2	
>50,000	14	5.8	3	3.3	17	5.1	
4Ps Recipient**							**0.046**
Yes	10	4.1	9	9.8	19		
No	232	95.9	83	90.2	315	5.7	
Father's Marital status							**<0.001**
Single	68	28.1	41	44.6	109	32.6	
Married	170	70.2	44	47.8	214	64.1	
Separated	-	-	-	-	-	-	
Widowed	4	1.7	7	7.6	11	3.3	
Others	-	-	-	-	-	-	

Legend:
**p-value ≦0.050 is considered significant; p-value < 0.01 is highly significant*
***4Ps means "Pantawid Pamilyang Pilipino Program", a government poverty reduction program that provides conditional cash transfers to poor households.*

Tables 1 and 2 present the socioeconomic and cultural profiles of the parents in the study. The majority of fathers were aged 32-40 years, with most having completed either high school or college and earning a monthly income below 10,000 PHP. A significantly higher proportion of fathers receiving 4Ps support delayed their consultation (9.8% vs. 4.1% for early consultation, $p<0.05$). Furthermore, a significantly higher proportion of single fathers delayed seeking care (44.6% vs. 28.1% for early consultation, $p<0.001$).

More mothers aged 41 years and above consulted late (53.3% vs. 43.8% for early consultation). A significantly higher proportion of mothers with only elementary education delayed consultation (23.9% vs. 12.4%, $p<0.05$). Most mothers had a monthly income below 10,000 PHP. A significantly larger proportion of those receiving 4Ps support delayed consultation (6.5% vs. 1.7%, $p<0.05$). Additionally, single mothers were significantly overrepresented among late consultations (45.7% vs. 29.3%, $p<0.01$).

Table 2. Mothers' Characteristics Influencing Decision for Early or Late Consultation of their Children with Dengue

Characteristics	Early consultation ≤ 5 days		Late Consultation >5 days		Total		P-value*
	n	%	N	%	N	%	
Mother's Age, years							**0.023**
15 to 20	2	0.8	0	0	2	0.6	
21 to 30	24	9.9	16	17.4	40	12	
32 to 40	110	45.5	27	29.3	137	41	
41 to 50	84	34.7	34	37	118	35.3	
Above 50	22	9.1	15	16.3	37	11.1	

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Mother's Educational Level							**0.013**
Elementary	30	12.4	22	23.9	52	15.6	
Highschool	98	40.5	42	45.7	140	41.9	
College	112	46.3	28	30.4	140	41.9	
Postgraduate	2	0.8	0	0	2	0.6	
Mother's Type of Work							0.432
Health professional	1	0.4	0	0	1	0.3	
Education professional	-	-	-	-	-	-	
Legal, social, and welfare	19	7.9	5	5.4	24	7.2	
Science	-	-	-	-	-	-	
Engineering	21	8.7	5	5.4	26	7.8	
Information technology	11	4.5	0	0	11	3.3	
Business, HR, and finance	43	17.8	16	17.4	59	17.7	
Marketing, PR, sales	17	7	6	6.5	23	6.9	
Arts, design, and media	1	0.4	1	1.1	2	0.6	
Childcare, health and education	2	0.8	0	0	2	0.6	
Clerical, secretarial	28	11.6	10	10.9	38	11.4	
Retail	7	2.9	5	5.4	12	3.6	
Others	92	38	44	47.8	136	40.7	
Mother's Average Monthly Income, PHP							0.091
<10,000	108	44.6	57	62	165	49.4	
10,000 – 20,000	55	22.7	17	18.5	72	21.6	
21,000 – 30,000	26	10.7	6	6.5	32	9.6	
31,000 – 40,000	17	7	4	4.3	21	6.3	
41,000 – 50,000	5	2.1	0	0	5	1.5	
>50,000	31	12.8	8	8.7	39	11.7	
4Ps Recipient							**0.02**
Yes	4	1.7	6	6.5	10	3	
No	238	98.3	86	93.5	324	97	
Mother's Marital Status							**<0.001**
Single	71	29.3	42	45.7	113	33.8	
Married	170	70.2	44	47.8	214	64.1	
Separated	-	-	-	-	-	-	
Widowed	1	0.4	6	6.5	7	2.1	
Others	-	-	-	-	-	-	

Legend:

**p-value ≦0.050 is considered significant; p-value < 0.01 is highly significant*

Table 3. Patients' Characteristics Influencing Parents' Decision for Early or Late Consultation

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Characteristics	**Early consultation**		**Late Consultation**		**Total (N=334)**		**P-value**
	≤5 days		**>5 days**				
	N=242	**72.50%**	**N=92**	**27.50%**	**n**	**%**	
Age of Patient							0.039
0 to 30 days	-	-	-	-	-	-	
1 month to 2 years old	30	12.4	10	10.9	40	12	
2 to 6 years old	43	17.8	8	8.7	51	15.3	
6 to 12 years old	108	44.6	38	41.3	146	43.7	
12 to 18 years old	61	25.2	36	39.1	97	29	
Sex							0.565
Male	123	50.8	50	54.3	173	51.8	
Female	119	49.2	42	45.7	161	48.2	
Dengue Episode							0.341
Primary Dengue Infection	212	87.6	84	91.3	296	88.6	
Secondary Dengue Infection	30	12.4	8	8.7	38	11.4	
Comorbidity							0.433
Yes	40	16.5	12	13	52	15.6	
No	202	83.5	80	87	282	84.4	

Legend:

**p-value ≦0.050 is considered significant; p-value < 0.01 is highly significant*

Table 3 presents the demographic information and baseline data obtained from the patient charts. Among 334 patients analyzed, 27.5% consulted five or more days after fever onset, classified as late consultation. A significantly higher proportion of patients aged 6 to 18 years had late consultations (80.4% vs. 69.8%, p<0.05). Approximately half of the patients were male, and primary dengue infection was the predominant clinical presentation.

Table 4. Hospital Factors Influencing Parents' Decision for Early or Late Consultation of their Children

Hospital Characteristics	**Early consultation**		**Late Consultation**		**Total (N=334)**		**P-value***
	≤5 days		**>5 days**				
	N=242	**72.50%**	**N=92**	**27.50%**	**n**	**%**	
Health Insurance							0.478
*PhilHealth***	200	82.6	81	88	281	84.1	
*HMO****	35	14.5	8	8.7	43	12.9	
Out-of-pocket	6	2.5	2	2.2	8	2.4	
Others	1	0.4	1	1.1	2	0.6	
Hospital Sector							**<0.001**
Private	92	38	62	67.4	154	46.1	
Public	150	62	30	32.6	180	53.9	
Proximity of Residence to Hospital							**<0.001**
<50kms	224	92.6	66	71.7	290	86.8	
>50kms	17	7	24	26.1	41	12.3	
>100kms	1	0.4	2	2.2	3	0.9	

Legend:

**p-value ≦0.050 is considered significant; p-value < 0.01 is highly significant*

***The Philippine Health Insurance Corporation (PhilHealth) administers the National Health Insurance Program, established to provide health insurance coverage and ensure affordable, acceptable, available, and accessible health care services for all citizens of the Philippines.*

****"HMO" or Health Maintenance Organization is a type of managed care health insurance plan that offers a network of doctors, hospitals, and medical care services for a monthly or annual fee.*

Table 4 summarizes hospital-related factors influencing parental decisions on consultation timing for children with suspected dengue. PhilHealth was the most common source of health financing. A significantly higher proportion of patients with late consultations sought care at private hospitals (67.4% vs. 38.0%, p<0.05). Additionally, patients residing over 50 kilometers from the hospital consulted late (28.3% vs. 7.4%, p<0.05).

Table 5 summarizes the parents' responses to the survey questions. A higher proportion of parents with late consultations answered "No" to consulting a doctor at the fever onset (85.9% vs. 73.1%, p<0.05). More than half of the respondents reported consulting a doctor after three days of fever and giving a herbal concoction of *Euphorbia hirta* (*tawa-tawa*) leaves to their sick child. Almost half reported giving ayurvedic water or herb concoctions to their child before seeking medical care. Significantly more parents with late consultations gave turmeric or *luyang*

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dilaw (15.2% vs. 6.6%, p<0.05) and sought faith healers or *albularyos* (42.4% vs. 26.9%, p<0.01).

Table 5. Respondents' Answers to Questions on Health Beliefs and Practices

Responses to Questionnaire*	Early consultation ≦5 days		Late Consultation >5 days		Total		P-value**
	N	%	n	%	N	%	
1. Do you consult a doctor at the onset day of fever?							**0.014**
Yes	65	26.9	13	14.1	78	23.4	
No	177	73.1	79	85.9	256	76.6	
2. Do you bring your child to a doctor when the fever is prolonged more than 3 days?							0.414
Yes	138	57	57	62	195	58.4	
No	104	43	35	38	139	41.6	
3. Do you give "tawa-tawa" to your sick child knowing that he/she has dengue?							0.807
Yes	157	64.9	61	66.3	218	65.3	
No	85	35.1	31	33.7	116	34.7	
4. Do you give ayurvedic water or water with herb concoction to your sick child knowing that he/she has dengue?							0.249
Yes	104	43	46	50	150	44.9	
No	138	57	46	50	184	55.1	
5. Do you give turmeric or "luyang dilaw" to your sick child knowing that he/she has dengue?							**0.014**
Yes	16	6.6	14	15.2	30	9	
No	226	93.4	78	84.8	304	91	
6. Do you still bring your child to a doctor even when his/her fever has been temporarily resolved by ayurvedic water or water with herb concoction?							0.978
Yes	139	57.4	53	57.6	192	57.5	
No	103	42.6	39	42.4	142	42.5	
7. Do you bring your child to a faith healer or "albularyo" when she/he is sick with fever?							**0.006**
Yes	65	26.9	39	42.4	104	31.1	
No	177	73.1	53	57.6	230	68.9	

Legend:
** Response was provided by only 1 parent per child.*
***p-value ≦0.050 is considered significant; p-value < 0.01 is highly significant*

Table 6. Simple Logistic Regression for the Association of Parents' Decision for Early or Late Consultation with Hospital Factors

Hospital Factor	Odds Ratio	Std. Err.	P-value*	95% Confidence Interval
Health Insurance				
Philhealth (Reference)				
HMO	0.564	0.233	0.166	0.251 - 1.269
Out-of-pocket	0.823	0.681	0.814	0.163 - 4.163
Others	2.469	3.507	0.525	0.153 - 39.952
Hospital Sector				
Public (Reference)				
Private	0.297	0.077	**<0.001**	0.179 - 0.493
Proximity of Residence to Hospital				
<50kms (Reference)				
>50kms	4.791	1.661	**<0.001**	2.429 - 9.451
>100kms	6.788	8.368	0.12	0.606 - 76.038

Legend:
**p-value ≦0.050 is considered significant; p-value < 0.01 is highly significant*

Table 7. Simple Logistic Regression for the Association of Parents' Decision for Early/Late Consultation with Parental Factors

Parental Factor	Father				Mother			
	Odds Ratio	Std. Err.	P-value*	95% Confidence Interval	Odds Ratio	Std. Err.	P-value*	95% Confidence Interval
Age of Parent	1.018	0.016	0.253	0.988 - 1.049	1.011	0.014	0.419	0.984 - 1.039
Educational Level								
Elementary								
Highschool	0.891	0.369	0.78	0.395 - 2.007	0.584	0.196	0.11	0.303 - 1.129
College	0.474	0.202	0.079	0.205 - 1.092	0.341	0.12	**0.002**	0.171 - 0.679
Postgraduate	0.727	0.667	0.728	0.121 - 4.388				
Type of Work								
Health professional								
Education professional	0.444	0.567	0.525	0.037 - 5.406				
Legal, social, and welfare	1.067	1.148	0.952	0.129 - 8.793	0.55	0.294	0.264	0.193 - 1.570
Science								
Engineering					0.498	0.264	0.188	0.176 - 1.408
Information technology	0.889	1.19	0.93	0.064 - 12.252				
Business, HR, and finance	0.632	0.487	0.552	0.139 - 2.867	0.778	0.269	0.467	0.395 - 1.531
Marketing, PR, sales	0.842	0.693	0.835	0.168 - 4.227	0.738	0.376	0.551	0.272 - 2.001
Arts, design, and media					2.091	2.982	0.605	0.128 - 34.212
Childcare, health and education	0.941	0.778	0.942	0.186 - 4.759				
Clerical, secretarial	1.333	1.094	0.726	0.267 - 6.653	0.747	0.307	0.478	0.333 - 1.673
Retail	0.667	0.694	0.697	0.087 - 5.127	1.494	0.916	0.513	0.449 - 4.971
Others	1.275	0.888	0.727	0.326 - 4.995				
Average Household Monthly Income								
<10,000								
10,000 – 20,000	0.79	0.259	0.473	0.415 - 1.503	0.575	0.185	0.086	0.306 - 1.081
21,000 – 30,000	0.593	0.252	0.219	0.257 - 1.365	0.437	0.211	0.086	0.170 - 1.124
31,000 – 40,000	0.222	0.235	0.156	0.028 - 1.773	0.446	0.258	0.163	0.143 - 1.388
41,000 – 50,000	0.741	0.863	0.797	0.076 - 7.261				
>50,000	0.476	0.311	0.257	0.132 - 1.716	0.505	0.217	0.113	0.217 - 1.174
Is 4Ps Recipient								
Yes								
No	0.398	0.19	0.053	0.156 - 1.012	0.241	0.158	**0.03**	0.066 - 0.874
Parental marital status								
Single								
Married	0.429	0.112	**0.001**	0.258 - 0.715	0.438	0.113	**0.001**	0.264 - 0.725
Widowed	2.902	1.908	0.105	0.800 - 10.524	10.143	11.132	0.035	1.180 - 87.172

Legend:
**p-value ≦0.050 is considered significant; p-value < 0.01 is highly significant*

Univariate analysis (Tables 6 and 7) revealed that late consultation was significantly associated with residing more than 50 kilometers from the hospital and having a widowed mother (p<0.05). Conversely, early consultation was significantly associated with private hospital care, a married father, a mother with a college education, and a mother who is not a 4Ps recipient (p<0.05).

Table 8 summarizes the analysis of the parents' responses to the questionnaire. Parents who answered "No" to the question "Do you consult a doctor at the onset day of fever?" were significantly associated with late consultation (p<0.05). Similarly, a "No" response to "Do you give turmeric (luyang dilaw) to your sick child knowing that he/she has dengue?" was also significantly associated with early consultation (p<0.05). In contrast, answering "No" to the question "Do you bring your child to a faith healer or albularyo when she/he is sick with fever?" was highly significantly associated with early consultation (p<0.01).

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Table 8. Parents' Responses to the Questionnaire on Health Beliefs and Practices

Question/Response	Odds Ratio	Std. Err.	P-value*	95% Confidence Interval
Q1. Do you consult a doctor at the onset day of fever?				
Yes (Reference)				
No	2.232	0.742	**0.016**	1.163 - 4.283
Q2. Do you bring your child to a doctor when the fever is prolonged more than 3 days?				
Yes (Reference)				
No	0.815	0.204	0.414	0.498 - 1.332
Q3. Do you give "tawa-tawa" to your sick child knowing that he/she has dengue?				
Yes (Reference)				
No	0.939	0.243	0.807	0.566 - 1.558
Q4. Do you give ayurvedic water or water with herb concoction to your sick child knowing that he/she has dengue?				
Yes (Reference)				
No	0.754	0.185	0.25	0.466 - 1.220
Q5. Do you give turmeric or "luyang dilaw" to your sick child knowing that he/she has dengue?				
Yes (Reference)				
No	0.394	0.153	**0.017**	0.184 - 0.845
Q6. Do you still bring your child to a doctor even when his/her fever has been temporarily resolved by ayurvedic water or water with herb concoction?				
Yes (Reference)				
No	0.993	0.246	0.978	0.611 - 1.614
Q7. Do you bring your child to a faith healer or "albularyo" when she/he is sick with fever?				
Yes (Reference)				
No	0.499	0.128	**0.007**	0.302 - 0.824

Legend:
**p-value ≦0.050 is considered significant; p-value < 0.01 is highly significant*

Multiple logistic regression analysis (Table 9) revealed several factors associated with late consultation. After adjusting for other variables, the odds of late consultation increased by 7% for each additional year of the patient's age (p<0.05). Patients admitted to private hospitals had 51% lower odds of late consultation compared to patients in public hospitals (p<0.05). Additionally, parents residing more than 50 kilometers from the hospital had 2.7 times higher odds of delaying consultation compared to those living within 50 kilometers (p<0.05). Although not reaching conventional levels of statistical significance, maternal marital status showed a borderline association with consultation timing (p-value=0.065), suggesting that being married may have a protective effect against delayed consultation. Similarly, seeking faith healing also demonstrated a borderline association (p-value=0.074) with a trend suggesting that avoiding faith healers may favor earlier consultation in children with dengue. Other factors were not significantly associated with the timing of consultations.

Table 9. Results of Backward Selection Procedure for Probable Predictors

Factor	Odds Ratio	Std. Err.	z	P value*	95% Confidence Interval
Age of Patient	1.072	0.031	2.44	0.015	1.014 - 1.134
Hospital Sector					
Public (Reference)					
Private	0.51	0.159	-2.17	0.03	0.277 - 0.938
Address proximity to hospital					
<50kms (Reference)					
>50kms	2.708	1.041	2.59	0.01	1.275 - 5.752
>100kms	8.358	10.836	1.64	0.102	0.658 - 106.090
Mother's marital status					
Single (Reference)					
Married	0.568	0.174	-1.85	0.065	0.311 - 1.036
Widowed	6.956	7.967	1.69	0.09	0.737 - 65.659
Q8 (Do you give turmeric or *"luyang dilaw"* to your sick child knowing that he/she has dengue?)					
Yes (Reference)					
No	0.503	0.22	-1.57	0.116	0.214 - 1.185
Q10 (Do you bring your child to a faith healer or *"albularyo"* when she/he is sick with fever?)					
Yes (Reference)					
No	0.598	0.172	-1.79	0.074	0.340 - 1.051

Legend:
**p-value ≦0.050 is considered significant; p-value < 0.01 is highly significant*

DISCUSSION

Dengue fever is a major public health concern in tropical countries like the Philippines. While only 5-10% of dengue cases progress to the severe form, the potential for an individual to contract the disease up to four times in his lifetime underscores the seriousness of this disease. Despite government efforts to reduce dengue-related mortality through prevention and control programs, late consultation remains a significant challenge for healthcare providers. This study explored the biological, health system, socioeconomic, and cultural factors influencing how Filipino families manage dengue infections in children.

The following factors impacted the decision of parents of children who had a fever to consult a doctor. The patient's age significantly influenced the timing of consultations for dengue fever. Our analysis found that for each additional year of a child's age, the odds of late consultation increased by 7%. Admission to private hospitals, location of the hospital within 50 km from the patient's residence, and having married mothers decreased the likelihood of late consultations. Encouragement from family and social support networks increased the prospects for early consultation. Parents who delayed consultations often relied on their existing knowledge and available medicines to initially treat their children at home. The odds of late consultations were

decreased for those parents who did not give turmeric or did not bring their children to faith healers.

Patient and Parental Factors That Influenced Late Consultation

The patient's age significantly influenced the timing of consultations for dengue fever, as symptoms varied notably across age groups due to serotype-specific immunity. The clinical course has been observed to differ between children and adults. Plasma leakage and dengue shock syndrome are more frequent in children than adults.[5] Studies have shown that adult patients, who often experienced milder symptoms, were more likely to delay seeking medical attention compared to children. Research in Southeast Asia has shown that adults frequently present with moderate symptoms and benefit from partial immunity due to prior infections, reducing their risk of severe dengue hemorrhagic fever (DHF).[4] In contrast, children, particularly those aged 2 to 15, were more susceptible to severe dengue and thus required earlier medical intervention.[6] Parental behavior further highlighted the influence of age, with most parents seeking medical attention for their children by the second day of fever onset, particularly when dengue was suspected. This pattern was supported by two studies that emphasized age as a key factor in healthcare seeking.[2,7] These studies showed a significant relationship between age and the urgency for treatment.

Hospital Factors That Influenced Late Consultation

Parents who brought their children to private hospitals were 51% less likely to delay consultation compared to those who went to public hospitals, highlighting the role of financial independence in accessing care. Gilson's seminal review underscored the persistent impacts of user fees deterring timely medical care, particularly in low and middle-income countries.[8] Subsequent studies confirmed that direct costs discouraged the economically disadvantaged from seeking timely care promptly.[9,10] Lower socioeconomic status has also been associated with inadequate dengue awareness and prevention practices.[11,12] However, this study found no significant influence of family income or health insurance on consultation decisions; however, while financial independence was crucial, many families lacked sufficient resources to cover healthcare expenses.

Geographic distance significantly contributed to delayed consultations. Patients residing more than 50 kilometers from the hospital were 2.7 times more likely to delay seeking care, with the odds rising to 8.4 times for those living over 100 kilometers away. Studies from 2008 and 2022 consistently identified access to healthcare as a major barrier for dengue patients, with travel distance frequently cited as a significant obstacle. Additional factors, such as poor road conditions, unsafe neighborhoods, limited transportation options, and high transport fees further exacerbated this challenge.[13-15]

Parental marital status and social support played significant roles in the timing of consultations for children with dengue. Married mothers had 57% lower odds of delaying consultation for their children compared to single mothers, likely due to the additional support provided by a husband. While not reaching conventional statistical significance, married mothers appeared less likely to delay consultation than single mothers. Conversely, widowed mothers were seven times more likely to delay seeking care than single mothers. Despite these findings, two previous studies found no significant association between marital status and health-seeking behavior.[16,17] Although mothers are traditionally the primary caregivers for sick children, a prior international study has shown that fathers' perspectives also played a pivotal role in determining whether or not a child receives medical attention.[18] Notably, modern families increasingly demonstrate shared responsibilities, with both parents actively involved in decision-making, especially concerning their children's health and well-being. Larger studies may be warranted to further explore these associations.

Socioeconomic Factors that Influenced Late Consultation

Family and social support emerged as critical facilitators of timely healthcare. Encouragement from relatives often motivated parents to seek early consultation, as shared responsibilities and support alleviate the burden of decision-making. A 2021 systematic review, underscored the importance of interpersonal support highlighting how family and community encouragement significantly promoted timely healthcare-seeking behavior for dengue patients.[19,20] The decision to seek care was often influenced by the family's primary authority figure, who is typically the breadwinner rather than the homemaker.[12,21] Homemakers, who are often women, may lack decision-making power or financial autonomy, leading to delays in seeking treatment

due to financial concerns or perceptions that health issues are not urgent. These findings emphasized the importance of spousal and social support in sharing household responsibilities, which can empower women to seek timely medical care for their families, ultimately improving overall health outcomes. Several quantitative studies have examined factors such as caregivers' education levels, familial decision-making dynamics, and the presence of dengue cases within social circles.[22-24] However, these factors were not found to influence healthcare-seeking behavior among parents of dengue patients significantly.

Cultural Factors that Influenced Late Consultation

The odds of late consultation were 50% lower among parents who did not give turmeric (*luyang dilaw*) to their children compared to those who did. This reflects a common coping strategy among some Filipino parents whose health beliefs significantly influenced their approach to illness. Traditional home remedies, such as turmeric, are particularly common in remote areas and often lead to delays in seeking professional medical care. Another common coping mechanism among Filipino families is their reliance on faith healers or folk doctors (*albularyos*). Although not statistically significant, parents who did not seek faith healers were more likely to consult doctors early. Umuhoza et al. (2018) reports on a similar finding in which caregivers who sought traditional healers before seeking formal healthcare were significantly more likely to delay medical consultation for their children. While the study does not explicitly state that avoiding faith healers leads to earlier consultations, the inverse relationship suggests a potentially beneficial effect of bypassing faith-based alternatives in favor of timely medical intervention.[25] The odds of late consultation were 60% lower among patients who were not taken to a faith healer or folk doctors compared to patients who were. The continued presence of *albularyos* and folk medicine services revealed the continued reliance on traditional healing in the country. Faith healers often served as key informants due to their prominent role in providing care.[26,27] Many families opt for traditional healers over licensed physicians because they are not required to pay fixed fees but instead rely on voluntary donations. [27] In contrast, professional healthcare services in hospitals or clinics, which require paying consultation fees, can pose a significant barrier for economically disadvantaged families.[27]

Together with these coping mechanisms, parents often relied on their existing knowledge and available medicines to initially treat their children at home. Self-treatment with pharmaceutical drugs and herbal remedies was often the initial response to illness, with formal health care being sought only when these methods failed.[28,29] Delayed seeking of consultation reflects a lack of awareness about the urgency of dengue treatment. This situation has been observed in countries like Malaysia, Myanmar, and Venezuela, driven by several factors including (i) the misconception that dengue is easily curable without risk of severe complications; (ii) limited transportation options in rural areas; (iii) deficiencies in healthcare services, such as poor ambulance response times, inadequate facilities, and low skills of health care providers, which erode community confidence in formal care; and (iv) dependence on symptom-relief therapies, particularly over-the-counter medications like paracetamol.[30] Addressing these barriers is essential to promote timely consultations and improve outcomes for dengue patients.

While cultural practices and health beliefs are vital aspects of Filipino identity and should be respected, health professionals in local health centers must emphasize the importance of early consultation over reliance on traditional remedies or faith healers. Financial support to single parents, the doctors-to-the-barrio program or Doctors Without Borders, and DOH deployment of pediatricians to remote municipalities are some government efforts to reduce barriers to timely consultation. These efforts to improve healthcare access will help reduce the reasons for late consultation in dengue, thus mitigating delays in the management of dengue cases.

Significant Factors in Late Consultation after the Backward Selection Procedure

The significant factors or predictors of late consultation in pediatric dengue patients were identified using stepwise backward selection. This statistical method iteratively removes less influential variables to optimize the regression model. Our analysis found that for each additional year of a child's age, the odds of late consultation increased by 7%. This suggests that parents or caregivers may prioritize the health concerns of younger children over those of the older ones, perceiving them as more vulnerable to severe dengue complications and death due to their immature immune systems.

Additionally, younger children's limited verbal abilities, which develop between 18-24 months, might hinder effective communication of symptoms, further complicating timely disease recognition. Other significant predictors included the hospital sector and proximity to healthcare facilities. Children brought to private hospitals were less likely to experience late consultation, and those living more than 50 kilometers away from a hospital were significantly more likely to experience delayed consultations.

These findings highlight the need to improve parental awareness about the importance of timely medical care for children of all ages and address barriers related to healthcare access, particularly for families living farther from hospitals or seeking care in specific healthcare sectors. Public health initiatives and educational programs can play a critical role in mitigating these disparities and ensuring better outcomes for pediatric dengue patients.

Limitations of the Study

This study was limited by the scope of sample collection from only two hospitals—one public and one private— located in a single area in the Philippines. Hence, the findings could not be generalized to the nationwide population affected by dengue. An expanded survey across multiple sites in different regions of the country would provide a more comprehensive and representative profile of dengue caregivers. The limited coverage of key factors influencing the knowledge, attitudes, and practices of parents and caregivers of suspected dengue patients was insufficient to inform guidelines for improving primary dengue care at the household and community levels. For example, the study did not account for variations in access to care and awareness of dengue management between urban and rural settings. Despite these limitations, the study demonstrated several universal factors, such as financial capacity, parental education, and public health measures, that significantly influenced timely consultation for dengue. These insights could be used as a basis for further research and targeted interventions.

CONCLUSION

The patient's age, the hospital sector where the patient is treated, the distance of residence from healthcare facilities, and the marital status of parent-caregivers significantly impacted parents' decisions to seek professional consultation for their children whom they suspect to have dengue fever. Specifically, older children, having a single mother, and those living farther than 50 kilometers from a hospital were at increased risk of late consultations. On the other hand, care sought in private hospitals was associated with a lower likelihood of delays.

Reliance on trusted traditional home remedies and the belief in divine intervention through faith healers contributed to delays in seeking early consultation. These results emphasize the importance of raising awareness among caregivers about timely medical consultations for children and addressing systemic barriers such as healthcare accessibility and sectoral differences. Interventions targeting these factors could help reduce delays in seeking care and improve outcomes for pediatric dengue patients.

RECOMMENDATIONS

From a policy and practice perspective, strengthening referral systems is crucial, particularly for families living more than 50 kilometers from hospitals, as distance was a significant predictor of delayed consultation. Policymakers should consider enhancing telemedicine services. Collaborations between public and private hospitals—such as referral agreements—could improve healthcare access. Targeted community health education campaigns should address misconceptions regarding faith healing and home remedies, especially among widowed mothers, who were identified as more likely to delay consultation.

In terms of clinical and public health practice, healthcare providers should reinforce early warning systems for severe dengue, ensuring that parents recognize the urgency of seeking immediate medical care for their children. Dengue rapid diagnostic kits (RDKs) can serve as dengue screening alternatives in areas that lack molecular testing.[31-33] Fostering trust for healthcare professionals is also essential, as this will encourage prompt medical consultation. Community health workers should actively engage families with young children. Dengue awareness campaigns in schools and barangay health centers should emphasize the importance of early medical intervention.

Potential research directions for enhancing timely dengue intervention include community-based approaches, such as public health campaigns aimed at raising awareness of early warning signs and the

importance of early consultation; assessing the economic burden of late-stage dengue treatment compared to early intervention; and utilizing telemedicine to guide parents on when to seek medical attention.

For methodological improvements**,** a longitudinal study to assess the long-term outcomes of delayed consultation will provide stronger evidence of its impact. Qualitative research that includes in-depth interviews and focus group discussions could explore parental decision-making and cultural beliefs. Expanding the study's geographical scope to include a broader range of provinces or urban-rural comparisons would improve the generalizability of the study's results.

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CONFLICT OF INTEREST

None declared.

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