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Knowledge, Attitudes, and Practices Regarding Dengue among the General Population in Honduras

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Abstract The incidence of dengue infections continues to rise worldwide, including the Americas where a dramatic increase in dengue infections has been reported during the last 5 decades. Honduras had the worst epidemic of dengue in 2010. Good knowledge, attitudes, and practices (KAP) among the public are required to successfully prevent or minimize dengue outbreaks. However, very little is known about the public's KAP on dengue and its prevention in Honduras. This study aimed to assess the level of KAP regarding dengue among the general population in Honduras. A household survey was conducted in eight communities in Gracias, Lempira in Honduras. Four hundred and twenty-three households were interviewed for this study. We found correlations between the educational level and knowledge score and between the knowledge and practice scores. Conversely, the lack of access to water affected dengue prevention practices. In multivariate analyses, dengue prevention practices significantly differed by educational level and access to water ($P < 0.05$). High education group had better practices than the low education group [adjusted odds ratio (aOR) of 1.62]. People who had access to water in their households had better practices than others who lived without access to water (aOR, 1.83). Our findings suggested that although the population had sufficient knowledge about dengue prevention, their actions against dengue could be limited by a lack of access to water. For eliminating mosquito breeding sites, not only providing education, but also improving water supply systems is essential.

Keywords: *dengue, knowledge, attitude, practice, Honduras*

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1. Introduction

Dengue infections occur in more than 100 countries in the Americas, the Asia-Pacific region, the Middle East, and Africa, and the number of infection cases continues to increase worldwide. Approximately 50–100 million infections occur each year [1,2]. Dengue incidence rates have mainly increased in tropical and subtropical regions of the world; a dramatic increase in dengue cases has been reported in the Americas during the last 5 decades [3,4,5].

Honduras had the worst epidemic of dengue during 2010, with 66,814 cases (3,266 severe cases) and 83 deaths. The peak of major reported cases occurred between EW24 and EW34, and mainly affected young people between the ages of 5 and 19 years. All four serotypes were seen; however, the most prevalent serotype was DENV-2 (92.5%) [6,7].

Dengue is an infectious disease that is transmitted through mosquito bite. Aedes aegypti, which is the vector mosquito, is ubiquitous in tropical and subtropical regions [8]. Currently, no commercial vaccine or effective drug against dengue is available. Therefore, controlling the reproduction of A. aegypti is the best prevention method.

Good knowledge, attitudes, and practices (KAP) among the public are required to successfully prevent or minimize dengue outbreaks. So far, many KAP investigations have been conducted and interesting results have been obtained in various countries [9-16]. However, very little is known about the public's KAP on dengue and its prevention in Honduras. To the best of our knowledge, to date, no KAP survey on dengue has been conducted in Honduran communities. We conducted a KAP survey in the city of Gracias in the Lempira department. The Lempira department is approximately 300 km west of the capital city of Tegucigalpa, and shares a border with El Salvador. Gracias is a departmental capital of Lempira, with a population of 59,289 people. In the Lempira department, 215 dengue cases were reported in 2014, of which 155 were from Gracias. The health department of Gracias implemented various strategies against dengue, such as spraying insecticides, imparting education in schools, organizing community meetings about dengue prevention, inspecting the mosquito breeding sites in the household, and running a clean-up campaign. Despite all efforts, the incidence of dengue in Gracias has increased over the last 3 years.

This study aimed to assess the level of KAP of the general population about dengue. Understanding KAP of

the general population on dengue and its prevention will provide valuable information for effective strategic planning and public engagement for dengue control.

2. Methods

A household survey was conducted in eight communities in Gracias. The selected sites for this study were Bella vista, Col Borjas, Col Julio Romero, Col Moreno, Col San Cristóbal, Las Palmas, Municipal 2, and Piñal del Campo; all eight sites were infested with mosquitoes. The 2014 Aedes mosquito larva survey that was completed in Epidemiological Week (EW) 30–EW 34 found that 16.6% of the households tested positive for Aedes larvae and that there were 20.4 containers with Aedes larvae per 100 households in those eight communities. We calculated a desired sample size of 384 households. This was based on a 95% confidence level, a 5% margin of error and a response distribution of 50%.

Seventeen interns from the Instituto Técnico Dr. Ramón Rosa were trained as local interviewers before the study. All of the households were visited in the selected sites, asked to participate in the study. In total, there were 423 households that contained at least 1 individual aged ≥15 years whom the interviewers could meet. The majority of the other 549 households were abandoned, and in some cases, the owners were absent or only kids were present. In these households, no interview was conducted. All of the 423 households with adults voluntarily provided their consent to participate in the study; one of the individuals of the household (aged ≥15 years) was interviewed face-to-face in Spanish by trained local interviewers. The data were collected from September to October 2014.

The questionnaire consisted of socio-demographic information and KAP related to dengue and its prevention. The questions on knowledge were open-ended and avoided guesses, which could give a false impression of the interviewee's knowledge. Conversely, the questions on attitudes and practices were provided with multiple-choice answers that evaluated the prevailing attitudes and assessed the frequency of preventive actions against dengue.

Data were entered into a Microsoft Excel spreadsheet and then transferred into Epi InfoTM 7.1.5 for analysis. KAP scores were calculated as the sum of the correct responses. Each correct and wrong answer was scored 1 and 0, respectively. In this study, the total possible scores were 25 for knowledge, 5 for attitudes, and 10 for practices. When these KAP scores were compared between different socio-demographic situations, the interviews of people who failed to respond to all questions were excluded.

Statistical analyses were performed using the chi-square test for comparing differences in the categorical variables and the t-test or one way analysis of variance for continuous variables. A P-value of <0.05 was considered statistically significant. A partial correlation coefficient was calculated to determine the correlation between KAP. Logistic regression analyses were used to identify the determinants of good practice. People who scored a practice score of ≥6 were considered to have good practices.

2.1. Ethical approval

This study was conducted in compliance with the Ethical Principles for Medical Research Involving Human Subjects of Helsinki Declaration. The study was approved by the Health Monitoring Division, Regional Office of the Health Department of Lempira. Informed consent was obtained from all participants before the interviews were started.

3. Results

3.1. Socio-demographic Characteristics of the Study Population

The 423 households voluntarily consented and participated in the study. The estimated participation rate was 44% (423 of 972 households, including the abandoned ones). Table 1 presents the socio-demographic characteristics of the participants. Of the total participants, 33% had completed secondary education or higher, 12% had some secondary education, 31% had completed primary education, 20% had some primary education, and 4.5% were illiterate. Four hundred and eleven (97%) households had electricity, and 317 (75%) households had access to water. Note that only 58%–66% of households had access to water in four of the communities (Bella vista, Col San Cristóbal, Las Palmas, and Piñal del Campo), while 95%–100% of households had access in the other four communities. Most of the households disposed waste using garbage trucks, whereas 74% of the households in Piñal del Campo burned waste by themselves.

Table 1. Socio-demographic characteristics of the study population

Variable		n	%
Total participants		423	
Gender			
	Male	132	31.4
	Female	288	68.6
Age			
	15-29	132	32.4
	30-44	159	39.1
	45-59	70	17.2
	60+	46	11.3
Education level			
	Illiterate	19	4.5
	Some Primary	83	19.8
	Completed Primary	129	30.8
	Some Secondary	50	11.9
	Completed Secondary	97	23.2
	Higher Education	41	9.8
Households with electricity		411	97.2
Households with access to water		317	74.9
Disposal of waste			
	Bury in the ground	7	1.7
	Burn	58	13.8
	Garbage truck	355	84.5

Table 2. Knowledge of dengue

Variable	n	%	% (95%CI)		
How is dengue transmitted?					
For the mosquito bites	402	95.26	92.65	~	97.01
Through food and water	1	0.24	0.01	~	1.52
Person to person	0	0.00			
Not wash the hands	0	0.00			
Others	8	1.90	0.88	~	3.85
Do not know	11	2.61	1.38	~	4.76
total	422				
What is the symptoms of dengue?					
Fever	343	81.28	77.16	~	84.82
Headache	323	76.54	72.14	~	80.44
Muscle pain	167	39.57	34.91	~	44.43
Vomiting	96	22.75	18.90	~	27.11
Joint pain	90	21.33	17.58	~	25.61
Bleeding	66	15.64	12.38	~	19.54
Pain behind the eyes	48	11.37	8.58	~	14.89
Nausea	45	10.66	7.96	~	14.10
Abdominal pain	40	9.48	6.94	~	12.78
Rash	6	1.42	0.58	~	3.23
Do not know	37	8.77	6.33	~	11.99
total	422	multiple response options			
How can we prevent dengue?					
Destroy the mosquito breeding sites	370	87.47	83.84	~	90.40
Clean the pila every 6 days	232	54.85	49.96	~	59.64
Cover water containers	135	31.91	27.54	~	36.62
Avoid putting tires outdoors	109	25.77	21.72	~	30.26
Spray with an insecticide	62	14.66	11.50	~	18.47
Put ABATE in the water	43	10.17	7.53	~	13.54
Use mosquito net	26	6.15	4.13	~	8.99
Others	9	2.13	1.04	~	4.15
Do not know	15	3.55	2.07	~	5.91
total	423	multiple response options			
What is the treatment for dengue?					
Take Acetaminophen	208	50.24	45.33	~	55.15
Drink plenty of fluids	78	18.84	15.26	~	23.02
Stay in bed	20	4.83	3.05	~	7.49
Do not know	185	44.69	39.85	~	49.62
total	414	multiple response options			
What is the warning signs of dengue hemorrhagic fever?					
Bleeding	187	45.50	40.63	~	50.45
Severe abdominal pain	66	16.06	12.72	~	20.05
Platelet depletion	33	8.03	5.67	~	11.20
Anuria	16	3.89	2.32	~	6.38
Do not know	182	44.28	39.44	~	49.24
total	411	multiple response options			

3.2. Knowledge of Dengue and Its Prevention

Table 2 presents the participants' knowledge about dengue. It was found that 402 (95.3%; 95%CI = 92.7–97.0) participants knew that mosquito bites transmitted dengue. With respect to symptoms, >75% of participants recognized fever (n = 343, 81.3%; 95%CI = 77.2–84.8) and headache (n = 323, 76.5%; 95%CI = 72.1–80.4) as symptoms of dengue. One hundred and sixty-seven (39.6%; 95%CI = 34.9-44.4) participants could identify muscle pain as a symptom, but fewer could identify vomiting, joint pain, bleeding, pain behind the eyes, nausea, abdominal pain, and rash as the symptoms of dengue. Moreover, 37 (8.8%; 95%CI = 6.3–12.0) participants could not identify any symptoms. In addition, 182 (44.3%; 95%CI = 39.4–49.2) participants could not recognize any warning signs of dengue hemorrhagic fever. When the participants were asked how they could prevent dengue, 370 (87.5%; 95%CI = 83.8–90.4) participants said that destroying mosquito breeding sites could prevent dengue. Approximately half of the participants (n = 232, 54.9%; 95%CI = 50.0–59.6) believed that cleaning the pila every 6 days was a prevention method. A pila is a water basin which is very common in the Central America. Covering water containers was considered as a prevention method by one-third (n = 135, 31.9%; 95%CI = 27.5–36.6) of the participants. Conversely, the knowledge of treatment was limited. Only half of the participants (n = 208, 50.2%; 95%CI = 45.3–55.2) could identify that acetaminophen was appropriate for dengue fever. Furthermore, 185 (44.7%; 95%CI = 39.9–49.6) participants did not know any treatments for dengue.

3.3. Attitudes towards Dengue

Table 3 presents the attitudes of all participants toward dengue. Almost all participants considered that dengue was dangerous for their families (n = 414, 99.8%; 95%CI = 98.5–99.9) and that working for dengue prevention benefited them (n = 416, 99.1%; 95%CI = 97.4–99.7). Four hundred and seventeen (99.3%; 95%CI = 97.8–99.8) participants agreed to the inspection of their households by health department staff members. Three hundred and seventy-nine (89.8%; 95%CI = 86.4–92.5) participants considered themselves responsible for dengue prevention. More than half of the participants said that they would visit the hospital (n = 281, 66.8%; 95%CI = 62.0–71.2) or health center (n = 199, 47.3%; 95%CI = 42.4–52.2) if they had dengue.

Table 3. Attitudes towards dengue

Variable		n	%	% (95%CI)		
Where do you go to when you catch dengue?						
	Hospital	281	66.75	61.99	~	71.19
	Health center	199	47.27	42.43	~	52.16
	Others	4	0.95	0.30	~	2.58
	Pharmacy	3	0.71	0.18	~	2.25
	Therapist	0	0.00			
	Do not know	1	0.24	0.01	~	1.53
	total	421	multiple response options			
Do you agree that health department staff member visits for inspection of your household?						
	Yes	417	99.29	97.75	~	99.82
	No	3	0.71	0.18	~	2.25
	total	420				
Do you think dengue is dangerous for your family?						
	Yes	414	99.76	98.45	~	99.99
	No	1	0.24	0.01	~	1.55
	total	415				
Do you benefit from working for prevention of dengue?						
	Yes	416	99.05	97.41	~	99.69
	No	4	0.95	0.31	~	2.59
	total	420				
Who has responsibility for avoiding reproduction of mosquito Aedes Aegipty?						
	Themselves	379	89.81	86.42	~	92.45
	Health department	16	3.79	2.26	~	6.21
	Municipal authorities	3	0.71	0.18	~	2.24
	Others	14	3.32	1.90	~	5.64
	Do not know	10	2.37	1.21	~	4.46
	total	422				

Table 4. Practices of dengue prevention

Variable	n	%	% (95%CI)		
Do you keep your garden clean?					
Yes	415	98.11	96.16	~	99.12
No	8	1.89	0.88	~	3.84
total	423				
Do you keep the drain clean?					
Yes	393	97.76	95.64	~	98.90
No	9	2.24	1.10	~	4.36
total	402				
How often do you wash the pila?					
Every 3 days	241	57.52	52.62	~	62.28
Every 6 days	69	16.47	13.12	~	20.45
Every 8 days	80	19.09	15.51	~	23.26
Every 12-15 days	11	2.63	1.39	~	4.79
Others	7	1.67	0.73	~	3.57
Never	2	0.48	0.08	~	1.91
Don't have pila	9	2.15	1.05	~	4.18
total	419				
Do you use insect repellent or mosquito net?					
Yes	227	54.05	49.15	~	58.87
No	193	45.95	41.13	~	50.85
total	420				
What do you do for dengue prevention?					
Destroy the mosquito bleeding sites	284	67.62	62.88	~	72.03
Wash the pila with Cl or detergents	200	47.62	42.77	~	52.51
Cover water containers	190	45.24	40.43	~	50.14
Put ABATE in the water	183	43.57	38.79	~	48.47
Spray with an insecticide	152	36.19	31.62	~	41.01
Use mosquito net	88	20.95	17.22	~	25.23
total	420	multiple response options			

3.4. Practices of Dengue Prevention

Table 4 presents the practices of all participants for preventing dengue. Almost all participants said that they kept their gardens (n = 415, 98.1%; 95%CI = 96.2–99.1) and drains (n = 393, 97.8%; 95%CI = 95.6-98.9) clean. More than half of the participants washed the pila every 3 days (n = 241, 57.5%; 95%CI = 52.6–62.3) or 6 days (n = 69, 16.5%; 95%CI = 13.1–20.5). About half of the participants (n = 227, 54.1%; 95%CI = 49.2–58.9) used insect repellent or mosquito nets. More than 40% of participants washed the pila with detergents (n = 200, 47.6%; 95%CI = 42.8–52.5) and put ABATE in the water (n = 183, 43.6%; 95%CI = 38.8–48.5). ABATE is the commercial name of the organophosphate larvicide temephos [17].

3.5. KAP Score

First, the community-wise KAP scores were analyzed (Table 5). The knowledge scores were significantly different among communities ($P < 0.01$). The five communities of Bella vista, Col Borjas, Col Julio Romero, Col Moreno, and Municipal 2 had higher knowledge scores (>7.5) than the three other communities of Col San Cristóbal, Las Palmas, and Piñal del Campo. No difference was found in the attitude scores ($P > 0.05$). Conversely, the practice scores were significantly different among communities ($P < 0.01$). The four communities of Col Borjas, Col Julio Romero, Col Moreno, and Municipal 2 had higher practice scores (>6.5), while others had lower practice scores.

Table 5. KAP score by community

	Bellavista n=58	**Col Borjas n=40**	**Col Julio Romero n=19**	**Col Moreno n=57**
Knowledge score	8.62 ± 3.83	8.93 ± 2.89	9.32 ± 3.94	7.63 ± 3.47
Attitude score	4.78 ± 0.46	4.93 ± 0.27	4.95 ± 0.23	4.88 ± 0.38
Practice score	5.31 ± 1.17	7.18 ± 1.43	7.53 ± 1.22	6.77 ± 1.76
	Col San Cristobal n=87	**Las Palmas n=46**	**Municipal2 n=26**	**Piñal del Campo n=29**
Knowledge score	6.99 ± 2.60	6.61 ± 3.04	8.35 ± 3.38	6.83 ± 2.28
Attitude score	4.80 ± 0.40	4.93 ± 0.25	4.73 ± 0.53	4.83 ± 0.38
Practice score	5.03 ± 1.13	4.98 ± 1.37	7.04 ± 1.56	5.03 ± 1.27
	Total n=362	**P-value**		
Knowledge score	7.72 ± 3.26	0.00021**		
Attitude score	4.85 ± 0.38	0.129		
Practice score	5.86 ± 1.66	<0.00001**		

Values are given as means ± SD. *P<0.05 and **P<0.01, according to a one way analysis of variance.

Figure 1 shows the matrix chart of knowledge and practice scores. A statistical correlation was found between the knowledge and practice scores (partial correlation coefficient = 0.273, n = 362). In complying with this result, seven communities (except Bella vista) could be roughly classified into the following two groups: the "better knowledge–better practice" group and the "poor knowledge–poor practice" group. Exceptionally, Bella vista had better knowledge but poor practices.

Figure 2 shows the matrix chart of the percent of households with access to water and the practice score. Obviously, it was found that the communities with better access to water had better practices.

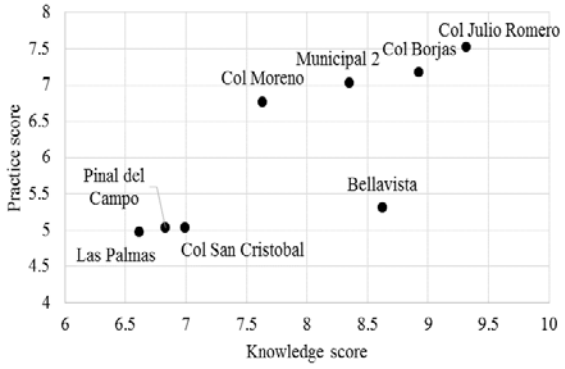

Figure 1. Knowledge score and practice score by community

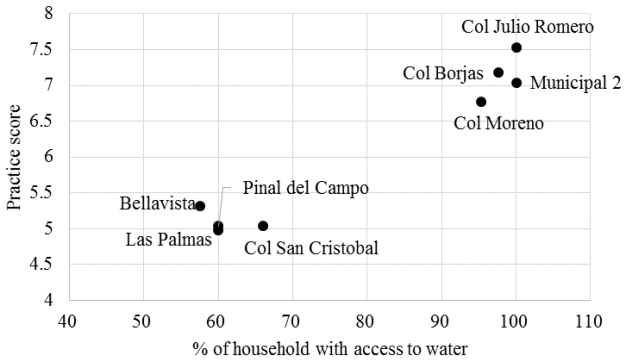

Figure 2. Access to water and practice score by community

Moreover, the associations between the KAP of dengue prevention and the socio-demographic characteristics of the participants were analyzed. Our study showed that there was an association between the educational level and knowledge score (Table 6). Participants who had completed secondary or higher education had better knowledge than those who had not completed secondary education. For instance, 67% of the high education group knew some of the warning signs of dengue hemorrhagic fever, while only 49% of the low education group could identify any warning signs [odds ratio (OR) = 2.1449, 95%CI = 1.3971–3.2932]. Likewise, 62% of the high education group knew some treatments for dengue, but only 51% of the low education group could identify any treatments (OR = 1.5653, 95%CI = 1.0278–2.3839). Other socio-demographic factors, including gender, age, access to electricity and water, and the method of waste disposal, did not show a significant association with the knowledge score.

In terms of attitude, there were no socio-demographic factors that were significantly associated with attitude score.

With regard to practice, there were associations between the educational level and practice score and between access to water and the practice score (Table 6). For example, 61% of the high education group declared that they washed the pila with detergents, whereas only 41% of the low education group declared this (OR = 2.2378, 95%CI = 1.4746–3.3961). Likewise, 54% of those who had access to water in their household declared that they washed the pila with detergents, whereas only 29% of those without access to water declared this (OR = 2.8198, 95%CI = 1.7559–4.5283). No other socio-demographic characteristics showed significant associations with practice score.

Table 6 shows the mean KAP scores compared with the educational levels and the aspects of household access to water. There were significant differences between the high and low education groups regarding the knowledge ($P < 0.0001$) and practice ($P < 0.05$) scores. Conversely, only the practice score showed a significant difference between the households with and without access to water ($P < 0.0001$). From these results, it was suggested that the educational level and access to water could be determinants of the public's dengue prevention practice at the study sites.

In addition, logistic regression analyses were applied to avoid confounding. The educational level and access to water were significantly related with dengue preventive practices in both univariate and multivariate analyses. The high education group was more likely to have good practices (practice score ≥6) than the low education group (aOR: 1.6229; 95%CI = 1.0352–2.5444). Also, people who had household access to water were more likely to have good practices than those who did not have access to water (aOR: 1.8255; 95%CI = 1.1186–2.9791).

Table 6. KAP score by education level and by access to water

	High Education n=124	**Low Education n=234**	**P-value**
Knowledge score	8.65 ± 3.07	7.18 ± 3.25	0.00004 **
Attitude score	4.86 ± 0.37	4.83 ± 0.40	0.491
Practice score	6.15 ± 1.75	5.69 ± 1.60	0.013 *
	With access to water n=271	**Without access to water n=91**	**P-value**
Knowledge score	7.83 ± 3.16	7.42 ± 3.53	0.301
Attitude score	4.84 ± 0.39	4.86 ± 0.38	0.735
Practice score	6.07 ± 1.75	5.23 ± 1.15	0.00003 **

Values are given as means ± SD. *P<0.05 and **P<0.01, according to a t-test.

4. Discussion

In the present study, it was found that the level of knowledge on dengue was inadequate in the local people of Gracias. Particularly, most participants were not able to identify the warning signs of dengue hemorrhagic fever like bleeding, severe abdominal pain, platelet depletion, and anuria, and 44% of the participants could not identify any treatments for dengue. Although almost all participants knew that mosquito bites transmit dengue and >75% of them knew that fever and headache are principal symptoms, there is still scope for improvement in the promotion of dengue prevention strategy.

Our study showed that the educational level and knowledge score were correlated. This result is comparable to that found in similar KAP studies that were conducted in Malaysia [9] and Pakistan [10]. It appears that the high education group had more awareness on the subject, easier access to information, and the ability to understand information.

Further, a statistical correlation was found between the knowledge and practice scores in our study. This was similar to the previous studies conducted in Laos [11] and Nepal [12]. However, several studies have reported no correlation between knowledge and practices [9, 13, 14]. At our study sites, all communities, except Bella vista, showed a correlation between the knowledge and practice scores; access to water was suspected as a cause of this mismatch in Bella vista.

In Honduras, almost all houses have a "Pila". A pila is a concrete water basin that often has two laundry scrubbing platforms or sinks on each side of the basin. Many places in Central America have running water only during certain

times of the day, so they collect and store water in the pila and use it throughout the day. The condition of water supply affects vector ecology. Domestic water storage containers, like pila, can be breeding sites for *A. aegypti*. For the necessarily of storing water in the pila, they face a risk of dengue infection. Therefore, health promotors encourage the locals to wash the pila every 3 days to eliminate mosquito breeding sites. However, it appears to be difficult to frequently wash the pila without having a stable water supply.

At any rate, our findings showed that even if the population had adequate knowledge of dengue, it was difficult to realize practices for reducing mosquito breeding sites without a stable water supply. In other words, to eliminate mosquito breeding sites, not only providing education but also improving water supply systems is essential. Some previous studies have also stated this point. Studies in Brazil showed associations between insufficient water supply and dengue transmission [18, 19]. Gubler and Clark identified the lack of planned urbanization and inadequate potable water and waste disposal services as infrastructural problems contributing to dengue transmission [20]. Pérez-Guerra et al. suggested strategies that would motivate residents to implement dengue prevention actions, such as the integrated involvement of government agencies improving potable water services in communities with reduced access and enhancing waste collection services by reducing waiting periods for pick-up [21]. Many developing countries continue to face difficulties in providing a stable water supply to all households for economic and technical reasons. However, local authorities must continue their efforts to improve access to water, while trying other approaches, such as education and promotion, against dengue. Also, further studies are needed to provide behavior change communication (BCC) effectively in the community.

The results of our study must be interpreted with caution because the study was limited by methodological issues, such as bias, confounding, and imprecision, which can be common in many large-scale observational studies. Moreover, the sample size was also limited. In our study sites, there were no accurate data on the number of total households or populations. It appeared that there were many abandoned houses; however, the interviewers could not identify whether the home was an abandoned house or the owners of the house were absent. In addition, there was some variability among interviewers, although they all had been carefully trained and supervised. More importantly, it may be possible that some respondents provided socially desirable responses to some questions [22], particularly in the attitude domain, as the survey was conducted through face-to-face interviews. Likewise, in the practice questionnaire, the interviewer only asked and did not inspect the household for mosquito breeding sites. The participants might provide preferable answers despite a lack of actual dengue prevention practices.

Nevertheless, this study suggested that the conditions of life affected their dengue prevention practices and that further efforts are needed to improve the situation. In 2015, the Ministry of Health of Honduras began a project “Mesa Intersectorial” that assembled the responsible persons from not only health department but also various institutions such as the ayuntamiento, NGOs, and educational department of their city. This municipal committee was composed of those various institutions to facilitate more effective activities against dengue. At the monthly meeting, plans for dengue prevention in their cities were developed and approved. This intersectional approach may encourage effective activity that prevents dengue infestation.

5. Conclusions

We conducted an investigation of KAP about dengue in eight communities in the city of Gracias, Lempira in Honduras. There were correlations between the educational level and knowledge score and between the knowledge and practice scores. Conversely, we found that the lack of access to water affected their practices for dengue prevention. Although the population had sufficient knowledge about dengue prevention, their actions against dengue could be limited by the lack of access to water. For eliminating mosquito breeding sites, not only providing education, but also improving water supply systems is essential.

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Conflict of Interest

The authors declare no conflict of interest associated with this manuscript.

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