KNOWLEDGE, AWARENESS, AND PRACTICES ABOUT DENGUE FEVER AMONG RESIDENTS IN AN URBAN AREA IN ZAMBALES: ADHERENCE TO THE IMPLEMENTATION OF *4S KONTRA DENGUE*

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Abstract: **Prevention is most effective in reducing the risk of dengue infection, especially in endemic nations such as the Philippines. For the implementation of disease control strategies, assessing public knowledge, public health practices, and health attitudes about dengue fever is important. In the Philippines, from June to February, Dengue is widespread in all regions and is considered a significant public health issue that triggers outbreaks in this wet season. The objectives of this study were to assess public knowledge and examine dengue-related health practices among residents of Barangay San Isidro, Subic, Zambales. A cross-sectional descriptive design was used with a sample size of 500 respondents using the purposive sampling method. This study revealed that most of the residents are knowledgeable about the mode of transmission, vector, and peak biting time of dengue mosquitoes. Despite the high number of reported cases in their community, the respondents also showed good practices on how to avoid dengue transmission, following the 4S Kontra Dengue by the Department of Health.**

Keywords: **Dengue fever, Awareness, Attitude, 4S Kontra Dengue.**

I. INTRODUCTION

World Health Organization states that there are four serotypes of the virus that cause Dengue: DENV-1, DENV-2, DENV-3, and DENV-4. The primary vector of the Dengue virus is the female mosquito species called *Aedes aegypti* which lives in urban territories and breeds for the most part in man-made holders. This mosquito is a daytime feeder and ordinarily, the peak of its biting period is within the morning and the evening or before sunset. 129 countries are at risk of dengue infection and 70% of these countries are in Asia with 3.9 billion people at risk according to a study on the prevalence of dengue. The World Health Organization reported an 8-fold increase in the number of dengue cases over the last two decades. Cases were reported from 505,430 in the year 2000, to over 2.4 million in 2010, and 4.2 million in 2019. Between the years 2000 and 2015, the reported deaths increased from 960 to 4,032 (World Health Organization, 2020).

Khetarpal & Khanna (2016) mentioned in their study that Dengue is a highly infectious disease that is highly concentrated in tropical and subtropical regions putting the lives of people worldwide at risk of having the infection. There are several degrees of pathological conditions because of infection with DENV, these are: ranging from mild asymptomatic dengue fever (DF) to severe dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS) which can result in the death of the patient.

In the Philippines, Dengue is endemic in all regions and is considered a major public health problem that causes outbreaks during the wet season from June to February. The suspected, probable, and confirmed cases of Dengue were reported to the Philippines Integrated Disease Surveillance and Response System in 2007. These reported cases are mostly from hospitals, private clinics, rural health units, municipal or city health offices, and human quarantine stations (Undurraga et.al., 2017).

According to the 2019 Dengue Surveillance Update of the Provincial Health Office – Zambales (Provincial Epidemiology and Surveillance Unit), high cases were reported by the different Disease Reporting Units in the Province from January 1 to August 6, 2019. This is 21.3% higher compared to the same period last year (2018). 52% of cases were admitted to the hospitals. The Municipality of Subic had the highest number of recorded cases of Dengue Fever in Zambales in the year 2019 (January to August). Of those dengue cases, most affected individuals were from Barangay San Isidro.

To assess the practices of the respondents toward dengue fever, the *4S Kontra Dengue* which is the recommended dengue control program of the Department of Health (DOH) was used in this study.

II.   METHODOLOGY

A quantitative method was used to get essential and thorough information. The study used software to compute the respondents using a sample size calculator with 500 respondents. The purposive sampling method was used to select a sample of participants to represent the general community. Barangay San Isidro was selected for this study due to its high number of recorded cases of Dengue in the past years according to the data from the 2019 Dengue Surveillance Update of the Provincial Health Office – Zambales (Provincial Epidemiology and Surveillance Unit).

The following are the inclusion criteria of the respondents: (a) age of 18 years or above; (b) verbal and written consent for participation in the study; and (c) residency in Barangay San Isidro for more than 1 year. Written information about the study procedures was provided on the front page before the actual questionnaire. The survey questionnaires were circulated and collected upon receiving verbal and written informed consent.

III.   RESULTS AND DISCUSSION

TABLE 1. DISTRIBUTION OF PROFILE OF THE RESPONDENTS IN TERMS OF AGE

Age	Frequency	Percent
18-17	205	41.0
28-37	150	30.0
38-47	72	14.4
48-57	40	8.0
58-67	24	4.8
68 and above	9	1.8
Total	**500**	**100**

TABLE 2. DISTRIBUTION OF PROFILE OF THE RESPONDENTS IN TERMS OF SEX

Sex	Frequency	Percent
Male	187	37.4
Female	313	62.6
Total	**500**	**100**

Tables 1 and 2 show the Frequency and Percent Distribution of the Respondents Profile. Overall, 500 residents agreed to participate in this study with more than half of the respondents being female (313, 62.6%,) and the rest being male (187, 37.4%). The respondents aged 18-27 comprised (205, 41.0%) of the total, those aged 28-37 years (150, 30.0%), 38-37 years (74, 14.4%), 48-57 years (40, 8.0%), those aged 58-67 is (24, 4.8%), 68 and above with only (9, 1.8%).

TABLE 3. DISTRIBUTION OF PROFILE OF THE RESPONDENTS IN TERMS OF MARITAL STATUS

Marital Status	Frequency	Percent
Single	290	58.0
Married	195	39.0
Widow	15	3.0
Total	**500**	**100**

TABLE 4. DISTRIBUTION OF PROFILE OF THE RESPONDENTS IN TERMS OF EMPLOYMENT STATUS

Marital Status	Frequency	Percent
Unemployed	336	67.2
Employed	164	32.8
Total	**500**	**100**

The total share of the single group is (290, 58.0%), married is (195, 39.0%), and widow/er is (15, 3.0%). In this study, if people work for pay or profit during the survey, they are considered employed. Individuals are classified as unemployed if they do not have a job, have effectively looked for work, and are right now accessing work. Survey results showed that more than half of the respondents were unemployed (336, 67.2%), and the employed respondents were (164, 32.8%).

TABLE 5. DISTRIBUTION OF PROFILE OF THE RESPONDENTS IN TERMS OF EDUCATIONAL ATTAINMENT

Educational Attainment	Frequency	Percent
No Formal Education	11	2.2
Elementary Graduate	77	15.4
Secondary Graduate	256	51.2
College Graduate	137	27.4
Master's Graduate	7	1.4
Doctoral Graduate	5	1.0
Vocational	7	1.4
Total	**500**	**100**

Most of the participants were Secondary Graduates (256, 51.2%) whereas the lowest frequency belongs to those who graduated with a Doctoral Degree (5, 1.0%). Those participants who don't have a formal education (11, 2.2%), and elementary graduates (77, 15.4%). Lastly, those with Master's Degree and Vocational Course wherein each of them consist of (7, 1.4%).

TABLE 6. DISTRIBUTION OF PROFILE OF THE RESPONDENTS IN TERMS OF MAJOR SOURCES OF INFORMATION ABOUT DENGUE

Major Source of Information about Dengue	Frequency	Percent
Friends	42	8.4
Television	268	53.6
Newspaper	18	3.6
Doctor	38	7.6
Other Health Workers (Nurses, Midwives, BHW, etc)	61	12.2
Social Media	73	14.6
Total	**500**	**100**

Based on the results, almost half of the participants got the information about dengue primarily from the Television (268, 53.6%) followed by information from Social Media (73, 14.6%), Other Health Workers (61, 12.2%), Friends (42, 8. 4%), Doctor (38, 7.6%). And the Newspaper was the least used source of information (18, 3.6%). Television has been reported as the most popular source of information, amid the mobile phone revolution, wireless internet access, and social media. This is analogous to previous research, which was done in the town of Selangor, Malaysia in 2019 by Shabadi and G.S, that cited television as playing a major role in disseminating dengue evidence. Again, the role of mass media in transmitting the message to the public is critical.

TABLE 7. KNOWLEDGE OF THE RESPONDENTS TOWARD DENGUE FEVER

No.	Knowledge of the Respondents Toward Dengue Fever	Right Information / Possible Answers	Frequency (% of respondents got the right Information)
1	Have you heard about Dengue?	Yes	499 (99.8)
2	What is the mode of spread of Dengue?	Through a mosquito bite	474 (94.8)
3	Where did Dengue breed?	In clean stagnant water	85 (17.0)
4	What is the vector for Dengue Fever?	Mosquito	474 (94.8)
5	Do you know about the time of biting of dengue mosquitoes?	Between the morning and the evening or before sunset	368 (73.6)
6	Which disease is transmitted by the *Aedes* mosquito?	Dengue	323 (64.6)
7	What are the symptoms of dengue?	Common symptoms of dengue are high fever, joint pain, and rashes	325 (65.0)
8	What is the most life-threatening?	Dengue shock	111 (22.2)
9	What is the after-effect of Dengue Fever if untreated?	Death	444 (88.8)
10	What type of mosquito is the carrier of Dengue fever?	Aedes mosquito	317 (63.4)
11	Why are the children most affected by dengue compared to adults?	Low immune system is the reason why children are most affected by dengue compared to adults	472 (94.40
12	Do you think dengue is preventable?	Yes	483 (96.6)

Data shows that almost all the residents already heard of dengue (499, 99.8%), while (474, 94.8%) are aware that the mode of spread of dengue is through a mosquito bite. Only 17.0% (85) identified that the breeding site of the dengue mosquito is in clean stagnant water. 94.8% (474) respondents recognized that the vector of the dengue virus is a mosquito and 64.6% (323) are familiar that it is transmitted by a mosquito that belongs to the genus Aedes. Specifically, 63.4% (317) knew that *Aedes aegypti* is the carrier of the dengue virus. Meanwhile, 73.6% (368) answered that the peak biting period of dengue mosquitoes is between the morning and the evening or before sunset. 65.0% (325) recognized that the most common symptoms of dengue are high fever, joint pain, and rashes while only 22.2% (111) knew that dengue shock is the most life-threatening condition. The majority of the respondents (444, 88.8%) answered that death is the after-effect of dengue fever if untreated. 94.4% (472) believed that the low immune system is the reason why children are most affected by dengue compared to adults. It was also noticed that 96.6% (483) agreed that dengue is preventable.

The study revealed that most of the respondents have sufficient knowledge of dengue, specifically with the following: mode of transmission, carrier (vector) of dengue, time of biting, Aedes mosquito, symptoms, and effect of dengue, if untreated, and children as the most vulnerable in acquiring dengue. However, it was noted that they have very little knowledge in terms of breeding sites and the most life-threatening conditions of dengue with 17% and 22.2% respectively, getting the right answer. Most respondents are aware of dengue symptoms and can recognize the major symptoms like high fever, knee pain, rash, and headache. This was possibly attributed to the mass media's educational message that the main symptom of dengue is elevated sudden onset fever and joint pain. For them to pursue early care, their ability to identify the signs and symptoms of dengue was significant. According to Shabadi and G.S (2019), appropriate information on dengue symptoms has been reported in similar published research studies done in Pakistan, India, and Brazil.

TABLE 8. PRACTICES OF THE RESPONDENTS TOWARD DENGUE FEVER (BASED ON 4S KONTRA DENGUE)

No.	Practices of the Respondents toward Dengue Fever	Mean	Descriptive Rating
	Search and Destroy Mosquito Breeding Sites		
1	Replace the water and clean the flower vase once a week.	3.49	Always
2	Cover the holes around your house with soil or sand.	3.18	Frequently
3	Cover buckets, drums, or other water reservoirs.	3.61	Always
4	Remove and puncture the tires on your roof or surrounding tires in your area.	3.20	Frequently
5	Turn over bottles, cans, and other water storage that can be breeding sites of mosquitoes.	3.63	Always
6	Clean and remove water from the pantry	3.62	Always
	Self-protection Measures		
7	Avoid short clothing so that mosquitoes do not bite easily.	3.18	Frequently
8	Mosquito repellant can also be used during the day.	3.27	Always
	Seek Early Consultation		
9	If you have a fever for 2 days and have skin rashes, go, and consult the nearest health center or hospital immediately.	3.48	Always
	Say No to Indiscriminate Fogging		
10	Only use fogging if there is an outbreak.	2.80	Frequently
	Overall Mean	**3.24**	Frequently

In Table 8, ten (10) indicators were answered by the respondents during the survey. Indicators 1 to 6 are under *"Search and Destroy Mosquito Breeding Sites"* which show the following survey results: (1) Replace the water and clean the flower vase once a week (Mean score = 3.39; Always); (2) Cover the holes around your house with soil or sand (Mean score = 3.18; Frequently); (3) Cover buckets, drums or other water reservoirs (Mean score = 3.61; Always); (4) Remove and puncture the tires on your roof or surrounding tires in your area (Mean score = 3.20; Frequently); (5) Turn over bottles, cans, and other water storage that can be breeding sites of mosquitoes (Mean score = 3.63; Always); and (6) Clean and remove water from the pantry (Mean score = 3.62; Always).

Indicators 7 and 8 which are under *"Self-protection Measures"* show the following data: (7) Avoid short clothing so that mosquitoes do not bite easily (Mean score = 3.18; Frequently); (8) Mosquito repellant can also be used during the day (Mean score = 3.27; Always). Indicator 9 is under "Seek early consultation" which says If you have a fever for 2 days and have skin rashes, go and consult the nearest health center or hospital immediately with a Mean score of 3.48 or always. Indicator 10 which is under *"Say No to Indiscriminate Fogging"* says Only use fogging if there is an outbreak with a Mean score of 2.80 or frequently.

Overall, the residents of Barangay San Isidro got a mean score of 3.24 in their practices toward dengue fever. This implies that they are frequently following the dengue prevention and control program endorsed by DOH. Aside from the preventive measures endorsed by the DOH, there are also efficient protective measures that are also used by people today. Use of sprays such as insecticide, mosquito coils, a mosquito net around the bed, electric rackets, protective clothing such as wearing a long-sleeved shirt and long pants, and avoiding being outdoors at night.

IV. CONCLUSION

The majority of the respondents are under the age group 18-27 years old. Half of the total respondents reached secondary education only. This study indicates that the respondents' knowledge of the cause, mode of transmission, vector, and biting time characteristics was sufficient. On the other hand, their knowledge of life-threatening conditions if dengue is untreated and its breeding site is insufficient. It was also concluded that the respondents have good practices on how to prevent dengue transmission despite the high recorded cases in their community.

V. RECOMMENDATION

In the Philippines, dengue is a major public health issue and a health threat to Filipinos. This study recommends exploring and conducting larger population studies in rural and urban areas in Region III, or other provinces and regions with high cases of dengue. Future research could also concentrate on rural and urban areas where dengue was previously uncommon but is now becoming prevalent. The findings of this study are potential goals for improving public policies and steps that may be taken to minimize the likelihood of potential dengue outbreaks.

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