

## Original Research Article

# Knowledge, attitude, and preventive practice of preschool teachers on dengue fever in Mandalay City, Myanmar

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**Received:** 01 February 2021

**Accepted:** 04 March 2021

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### ABSTRACT

**Background:** Severe dengue has become a leading cause of hospitalization and death among children and adults in most Asian countries. WHO stated that the death rate of children with severe dengue who required hospitalization is about 2.5%. It is one of the principal epidemic diseases in Myanmar. Moreover, the highest numbers of dengue cases and deaths was between age 5 and 9 years followed by between age 2 and 4 years.

**Methods:** A cross-sectional study among 168 preschool teachers by surveying with semi-structured questionnaire.

**Results:** The mean age was 29.36±9.04 years. Nearly 70% of them were graduated. Only 30.95% had high level of knowledge, 48.81% had positive attitude and 44.64% had good preventive practice level. There were no significant associations between socio-demographic characteristics and levels of knowledge, attitude, and preventive practice with the exception between education and levels of knowledge ( $p=0.027$ ). Between knowledge and attitude, there was a significant association ( $p=0.005$ ). However, levels of prevention practice had no significant association with levels of knowledge and attitude.

**Conclusions:** Despite their high education, preventive practice still needs to be promoted.

**Keywords:** Attitude, Dengue fever, Knowledge, Preventive practice, Preschool teachers

### INTRODUCTION

Dengue fever is an arboviral disease that has rapidly spread in all regions over the world in recent years. It is transmitted by the bite of infected female *Aedes* mosquitoes. Among many species of *Aedes mosquito*, *Aedes aegypti* and *Ae. albopictus* are the main species that carry the dengue virus.<sup>1</sup> These mosquitoes also transmit chikungunya, yellow fever and Zika infection. There are 4 different serotypes of dengue virus (DEN-1, DEN-2, DEN-3, and DEN-4).<sup>2</sup>

They all cause similar clinical symptoms and give a lifelong type-specific immunity. However, cross-immunity with other serotypes of dengue will last a few

months and subsequent infections by other serotypes will increase the risk of developing severe dengue.

Dengue is widespread throughout the tropics, with local variations influenced by rainfall, temperature, and unplanned rapid urbanization. Before 1970, only 9 countries had experienced severe dengue epidemics. However, it is now a major public-health concern throughout tropical and sub-tropical regions of the world. One modelling made by Bhatt et al estimated that 390 million dengue virus infections per year (95% credible interval 284-528 million), of which 96 million (67-136 million) manifest clinically.<sup>3</sup> Another study also estimated that 3.97 billion people are at risk of dengue infection.<sup>4</sup> Moreover, among 129 countries at risk of infection, most of them (70%) are in Asia.<sup>3</sup> Dengue is one

of the principal epidemic diseases in Myanmar. Since 1960, sporadic cases of dengue have been reported in Myanmar. In a study conducted by Oo et al, between 2011 and 2015, there were a total of 89,832 cases and 393 deaths in hospitals, among them 97% of cases were children.<sup>5</sup> Moreover, an estimated 500 000 people with severe dengue require hospitalization each year and a large proportion of whom are children. WHO stated that among children who were affected, 25% of them die.<sup>6</sup>

From the above information, it should be concerned the reasons why the incidence of dengue cases is increasing. In order to reduce the increasing trend of dengue cases and case fatality rate of dengue fever, early detection of cases and timely and proper case-managements are mandatory. Besides, community participation and mobilization are essential in prevention and control of dengue fever. The knowledge about types of breeding places alone is not enough to achieve mosquito control. Attitude and beliefs impact a person's knowledge about mosquito control. Health education to improve knowledge, attitude, and practice of dengue fever in school teachers is important since the school environment is excellent for the development of an educational module on dengue. In the reduction of larval habitats in schools, the participation of the teachers together with pupils is essential in prevention of mosquito control.<sup>7</sup>

Ministry of Health and Sports, Myanmar had implemented Aedes free school programs for all over the whole country jointly with Ministry of Education. Moreover, teachers play an important role in prevention and control of dengue fever in dengue endemic areas. So, implementing dengue control programs in schools is a very important concept for reducing incidence of dengue fever. According to the Aedes free school program, the knowledge, attitude, and practice on dengue fever among school teachers are very important. Studies to assess the knowledge, attitudes, and practice on dengue fever among different study populations had been carried out. However, limited studies have been conducted to assess knowledge, attitude, and preventive practice of preschool teachers on dengue fever. Thus, in order to get correct and important information regarding dengue fever among them, it is important to assess knowledge, attitude, and preventive practice of them on dengue fever. Then, it could reduce the incidence of dengue cases and case-fatality rate among children.

## METHODS

The study was a cross sectional study and carried out in selected preschools of Mandalay City registered at Department of Social Welfare, Ministry of Social Welfare, Relief and Resettlement, The Republic of the Union of Myanmar. There were 62 registered preschools. Among them, 34 preschools were randomly selected. From each selected preschool, five preschool teachers were randomly recruited by lottery method. Before conducting the research, pre-testing of questionnaire was

done with a sample of 20 of preschool teachers from non-selected preschools in Mandalay City. Cronbach's alpha coefficients of knowledge questions on dengue fever was 0.81, that of attitude questions was 0.7 and that of prevention practice questions was 0.73. Selected preschool teachers according to inclusion criteria were explained about the study, objectives, and procedures. Obtaining informed consent from them was also made. There was no incentive for participating in this study. Face to face interview was done by the researcher himself using pre-tested questionnaire. It was comprised of 4 sections;

A: Socio-demographic characteristics of preschool teachers.

B: Questions regarding knowledge about dengue fever.

C: Questions regarding the attitude towards dengue fever.

D: Questions regarding practice on prevention and control of dengue fever.

For section A, there were questions regarding age, gender, education, years of teaching services and sources of information about dengue fever that they had received. For section B, 17 questions regarding knowledge on dengue fever were used. For each question, a correct answer was scored '1' and the others such as "incorrect and don't know" were given '0'. The scores ranged from 0-23 since there were more than one correct answer in question item 10, 11 and 12. The total scores were categorized into three levels as follow; high level (>80% of total knowledge scores), fair level (60-80% of total knowledge scores) and low level (<60% of total knowledge scores).<sup>8</sup>

For section C, it included 10 questions regarding attitude towards dengue fever. they were assessed by using 5 points Likert scale.<sup>9</sup> The score ranged from 10-50 and the total score was categorized into two levels by using mean reference as follows; positive attitude (> mean score) and negative attitude ( $\leq$  mean score).

For section D, there were 14 questions and scored 1 for 'yes' and 0 for 'no' on each item and there were 5 sub item questions. Among those sub items, three of them were given with scores ranged from 1 to 3 and the rest were given with scores ranged from 1 to 2. The total score ranged from 0-27 and it was cut off into three levels as follows; good practice (>80%), fair practice (60-80%) and poor practice (<60%).<sup>8</sup> Data entry was done by using Epi data software. Data summarization for description was done by showing frequency distribution tables and figures. Statistical analysis was performed with the use of statistical software Stata version 14. Chi square test or Fisher's exact test whatever appropriate were employed to explore association between knowledge level, attitude level and prevention practices towards dengue fever.

## RESULTS

The total of 168 preschool teachers were collected in this study and they were interviewed with a pre-tested structured questionnaire. The mean age of the respondents was 29.36 years±9.04 years ranged from 18 and 67 years. All of them are female and majority of them (n=116, 69.05%) were graduate level. Regarding their teaching services, nearly two-third of them (n=111, 66.07%) had less than 5 years and 20.24% (n=34) had services years between 5 and 10. Only 13.69% (n=23) had more than 10 years. Among sources of information about dengue fever they had received, radio was the top source (79.76%), followed by newspaper and magazine

(33.93%), health staff (33.93%), television (25%) and the least were others (22.02%) such as internet, social media, and environments.

Dengue related knowledge is shown in Table 1. The mean score was 16.67 whereas the minimum was 7 and the maximum score was 23. Knowledge scores less than 13 were categorized as 'Low level' and knowledge scores between 13 and 18 were grouped as 'Fair level' whereas knowledge scores more than 18 were as 'High level'. Among 168 preschool teachers, 52(30.95%) of them had high level of knowledge, 103(61.31%) had fair level of knowledge and only 13(7.74%) had low level of knowledge.

**Table 1: Knowledge regarding dengue fever (n=168).**

Characteristics	Correct answers		Incorrect answers		Don't know	
	N	%	N	%	N	%
<b>Causes of dengue fever</b>	81	48.2	44	26.2	43	25.6
<b>Mode of transmission of dengue fever</b>	165	98.2	2	1.2	1	0.6
<b>Type of mosquito that carry causal dengue virus</b>	107	63.7	27	16.1	34	20.2
<b>Dengue mosquito biting time</b>	145	86.3	23	13.7	0	0.0
<b>Dengue widespread season</b>	163	97.0	3	1.8	2	1.2
<b>Vulnerable groups to dengue fever</b>	165	98.2	2	1.2	1	1.06
<b>Breeding places of dengue mosquito **</b>					<b>N</b>	<b>%</b>
<b>Covered domestic water storage containers</b>					26	15.5
<b>Flower vases, ant traps, used tires, discarded tins and plastic bags</b>					124	73.8
<b>Waste water drainage channels</b>					122	72.6
<b>Don't know</b>					17	10.1
<b>Resting places of dengue mosquito **</b>					<b>N</b>	<b>%</b>
<b>Dark places</b>					148	88.1
<b>Well ventilated places</b>					5	2.9
<b>Waste water drainage channels</b>					113	67.3
<b>Don't know</b>					5	2.9
<b>Signs and symptoms of dengue fever **</b>					<b>N</b>	<b>%</b>
<b>Fever with rash</b>					160	95.2
<b>Fever with nausea and vomiting</b>					126	42.0
<b>Fever with aches and pain</b>					40	23.8
<b>Diarrhoea</b>					30	17.9
<b>Don't know</b>					20	11.9
<b>Warning signs of dengue fever **</b>					<b>N</b>	<b>%</b>
<b>Abdominal pain or tenderness</b>					26	15.5
<b>Lethargy, restlessness</b>					126	75.0
<b>Persistent vomiting</b>					90	53.4
<b>Mucosal bleed</b>					39	23.2
<b>Cough</b>					15	8.9
<b>Don't know</b>					14	8.3
<b>Prevention methods **</b>						
<b>Taking medicine for prevention</b>					20	11.9
<b>Elimination and destruction of breeding sources</b>					136	80.9
<b>Avoiding the direct contact with the patient</b>					17	10.1
<b>Avoiding mosquito's bite</b>					148	88.1
<b>Don't know</b>					8	4.8

\*\*multiple responses

**Table 2: Attitude towards dengue fever (n=168).**

Characteristics	Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
	N	%	N	%	N	%	N	%	N	%
Dengue fever cannot be prevented	50	29.8	106	63.1	8	4.8	3	1.8	1	0.6
It is a serious illness that can result in death	12	7.1	13	7.7	13	7.7	96	57.1	34	20.2
Cannot be controlled effectively	21	12.5	87	51.8	18	10.7	33	19.6	9	5.4
Important to avoid mosquito's bite	1	0.6	1	0.6	3	1.8	88	52.4	75	44.6
Important to cover, pour, change, and filter the stored water	1	0.6	1	0.6	3	1.8	81	48.2	82	48.8
Should put long sleeve and long trouser on the children during rainy season	0	0.0	1	0.6	3	1.8	92	54.8	72	42.9
Using bet nets whenever the children are sleeping	0	0.0	6	3.6	7	4.2	88	52.4	67	39.9
Should refer to the clinic or hospital whenever the children are suspected to have dengue fever	0	0.0	0	0.0	2	1.2	69	41.1	97	57.7
Eliminate mosquitoes both at home and school	0	0.0	1	0.6	2	1.2	53	31.6	112	66.7
Not important to cooperate with health organizations	86	51.2	74	44.1	2	1.2	6	3.6	0	0.0

**Table 3: Prevention practice of preschool teachers on dengue fever (n=168).**

Characteristics	N	%
<b>Checked larva breeding places in school environment</b>		
No	18	10.7
Yes	150	89.3
Once per two weeks	29	19.3
Once per week	72	48.0
Twice per week	34	22.7
Daily	15	10.0
<b>Took them away when you found larva in the water storage</b>		
No	19	11.3
Yes	149	88.7
<b>Covered water storage containers</b>		
No	2	1.2
Yes	166	98.8
<b>Changed water in flower vases and water storage containers</b>		
No	4	2.4
Yes	164	97.6
Once per two weeks	8	4.9
Once per week	48	29.3
Twice per week	71	43.3
Daily	37	22.6
<b>Filtered whenever you add water into domestic water containers</b>		
No	31	18.5
Yes	137	81.5

Continued.

Characteristics	N	%
Sometimes	23	16.8
Always	114	83.2
<b>Eliminated larvae in ant traps</b>		
No	59	34.5
Yes	110	65.5
<b>Disposed or cleaned the discarded water containers</b>		
No	6	3.6
Yes	162	96.4
<b>Opened windows during school time</b>		
No	1	0.6
Yes	167	99.4
<b>Performed in cleaning and disposing solid wastes</b>		
No	4	2.4
Yes	164	97.6
Once per two weeks	5	3.1
Once per week	59	35.9
Twice per week	74	45.1
Daily	26	15.9
<b>Checked symptoms of dengue fever whenever you suspected a child with fever</b>		
No	50	29.8
Yes	118	70.2
Within dengue season	68	57.6
A whole year	50	42.4
<b>Used bed nets whenever the children sleep</b>		
No	76	45.2
Yes	92	54.8
<b>Provided long sleeves and trousers to the children</b>		
No	11	6.6
Yes	157	93.4
<b>Used mosquito coil, killer aerosol spray, repellent to the children</b>		
No	16	9.5
Yes	152	90.5
<b>Participated and co-operated in mosquito control programmes with local health organization</b>		
No	84	50.0
Yes	84	50.0

Dengue-related attitude is shown in Table 2. The mean score was 42.58 with the minimum score, 32 and the maximum score, 50. Attitude scores were categorized as 'Positive' when scores were more than 42 and 'Negative' according to scores less than or equal 42. Among them, 82 (48.81%) had positive attitude towards dengue fever and 86 (51.19%) had negative attitude. Regarding prevention practice, they are shown in Table 3. The mean score was 20.67 with minimum score 10 and maximum score 26. Practice scores were categorized into 'Good', 'Fair' and 'Poor' according to the scores more than 21, between 16 and 21, less than 16 respectively. Among them, 75 (44.64%) of preschool teachers had good practice, 83 (49.40%) had fair practice and 10 (5.95%) had poor practice.

There were no significant association between socio-demographic characteristics and levels of knowledge of preschool teachers on dengue fever, except for the significant association between education and levels of

knowledge ( $p=0.027$ ). In addition, no significant association between socio-demographic characteristics with levels of attitude and prevention practice were found. Although there was a statistically significant association between levels of knowledge and those of attitude towards dengue fever ( $p=0.005$ ), there were no significant association between levels of knowledge and levels of prevention practice on dengue fever. Moreover, no significant association between levels of attitude and those of preventive practice was found.

## DISCUSSION

Regarding education of participants, in this study, nearly 70% of them were graduated. In the study conducted by Tun et al, nearly 90% of school teachers were graduated. Concerning sources of information about dengue fever among preschool teachers, 79.76% of them got information mostly from radio. They also got information from newspapers and journals which were accounted for

33.93% and the same percent from health staff. In the study of Tun et al, school teachers got information about dengue from 55.6% from television, 23.6% from newspaper and journals, and 14.9% from health staff and 5.8% from radio.<sup>10</sup> According from the above results, more health education programmes about dengue fever should be encouraged via health staff. Moreover, since technology is advancing quickly nowadays and people are being used to advanced technologies such as mobile phones and internet, it should be considered to provide health information about dengue fever more frequently via them.

Regarding knowledge of dengue fever, all preschool teachers had heard about it. Nearly half of them, 48.21% knew that it was caused by dengue virus. For the rest, 25.6% did not know the causal organism and other 26% had wrong knowledge about the causal organism. In the study done by Tun et al, all school teachers had heard about dengue fever and 84.9% of them knew that it was caused by dengue virus.<sup>10</sup> Comparing to that study, preschool teachers were found to be less knowledgeable about the causal organism and they need to be educated about dengue fever.

In this study, regarding the mosquito which causes the dengue fever, most of them did not answered exactly with the name 'Aedes mosquito' but with the name 'Striped mosquito'. From the aspect of prevention methods, there were some preschool teachers who had false knowledge about prevention and control of dengue fever. Therefore, there should be more health education programmes on prevention and control of dengue fever. According to the knowledge scores, only 30.95% of preschool teachers had high level of knowledge, which is lower than the findings 62.9% (mean knowledge score of 39.10 with SD 3.087) of primary school teachers of a study conducted in Myanmar.<sup>11</sup> Moreover, in the study conducted by Lakhier, teachers' knowledge related to dengue fever was quite high.<sup>12</sup> Since they were primary school teachers, they had been trained by teaching programmes than the preschool teachers which were mostly from private preschools. Therefore, health education programmes should be more encouraged and introduced in preschools.

In this study, only 48.81% of preschool teachers had positive attitude whereas 70.2% of school teachers studied in Tun et al had positive attitude.<sup>10</sup> And in the study conducted in Myanmar by Htun et al 57.7% of school teachers had positive attitude.<sup>11</sup> Moreover, in the study of teachers of Peshawar Garrison, most of them had positive attitude towards dengue fever prevention.<sup>12</sup> Although most of preschool teachers in this study had high and fair level of knowledge on dengue fever, more than half of them had negative attitude towards dengue fever. Then, it is necessary to improve their attitude by conducting behavioural change communication programs in preschools. In the prevention practices of preschool teachers on dengue fever, only 44.64% had good practice scores. Although their knowledge and attitude levels

regarding dengue fever were high and positive, nearly half of them had fair and only 5.95% had poor practice scores. However, percent of good practice level is not too different with comparing with the studies of Tun et al and Htun et al, 55.5% and 52.6% respectively.<sup>10,11</sup> Moreover, the practice score of the respondents was also higher and the participants demonstrated positive practices regarding DF prevention in the study conducted by Lakhier.<sup>12</sup> From this point of view, one might not practice preventive measures even though one's knowledge and attitude towards them were good and positive.

In this study, there was no significant association between socio-demographic characteristics and levels of knowledge, attitude, and prevention practices of preschool teachers on dengue fever. But there was a significant association between education and levels of knowledge of preschool teachers on dengue fever ( $p=0.027$ ). In the study conducted among school teachers in Thaketa Township, Yangon, there was a statistically significant association between the level of knowledge and the attitude towards dengue fever. Moreover, there was statistically significant association between the attitude towards dengue fever and the practice on prevention and control of it.<sup>10</sup> However, in the study among primary school teachers in Danuphyu Township, Myanmar, teachers who had high level of knowledge (57.4%) were found to be better in reported practice than the those who had low level of knowledge (44.4%), but their association was not statistically significant.

Similarly, even though teachers who had positive attitude (53.6%) were found to be better in reported practice than the teachers who had negative attitude (51.2%), their association was not statistically significant too.<sup>11</sup> In this study, there was a significant association between levels of knowledge and attitude of preschool teachers on dengue fever ( $p=0.005$ ). However, there was no significant association between levels of knowledge and practice of preschool teachers on dengue fever and there was also no significant association between levels of attitude and practice of preschool teachers. From this point of view, one's practice might not be changeable upon how high or low one's knowledge or attitude. Therefore, some training programs for prevention practices on dengue fever should be conducted among preschool teachers regularly. This study assessed knowledge, attitude, and practice of preschool teachers on dengue fever who were working at public and registered private preschools of Mandalay City, Myanmar. It did not include some unregistered private preschools. Hence, this may limit the generalizability of the study. Finally, this study could not be concluded causal relationship between KAP and other factors since this is a cross-sectional study.

## CONCLUSION

Among the preschool teachers in this study, half of them were between 21 to 30 years of age and all of them were

female. Nearly two-third of preschool teachers were graduate. However, almost two-third of them had less than 5 years of teaching services. Hence, there would be more effective when health education programs, health behaviour change programs and training programs for prevention practices on dengue fever were applied to them. Majority of preschool teachers got information about dengue fever from radio. Thus, it can be concluded that information about dengue fever from other sources such as health staffs, television, newspaper, and journal were reaching less to preschool teachers. From the aspect of knowledge for prevention of dengue fever, majority of preschool teachers had high level of knowledge about them but there were still some of them had false knowledge. Regarding attitude of preschool teachers towards dengue fever, more than half of them had negative attitude. It can be concluded that their predisposition and intention towards dengue fever was not good although most of them had high and fair levels of knowledge on dengue fever.

As for prevention practices of preschool teachers on dengue fever, less than half of them had good level of practice and other nearly half of them had fair level of practice. It can be concluded that the prevention practice of preschool teachers on dengue fever had fair enough to prevent dengue fever but not good enough to prevent. Although there were many health education programs for dengue fever, it was not sufficient to change prevention practices of preschool teachers. Therefore, some training programs for prevention practices on dengue fever should be conducted among preschool teachers regularly.

#### ACKNOWLEDGEMENTS

Authors would like to express their deepest gratitude to Professor San San Htay, Former Professor and Head of Department of Preventive and Social Medicine, University of Medicine, Mandalay, and Associate Professor Soe Moe Naing, Head of Department of Preventive and Social Medicine, University of Medicine Mandalay for giving them the opportunity to conduct this study and for their kind guidance, support, encouragement, and continuous care during the study also they are grateful to the faculty members of Department of Preventive and Social Medicine, University of Medicine, Mandalay, Myanmar. Authors thank all preschool teachers for their willing participation and cooperation in this study.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

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**Cite this article as:** Min H, Soe PP, Moe H, Oo WM. Knowledge, attitude, and preventive practice of preschool teachers on dengue fever in Mandalay City, Myanmar. *Int J Community Med Public Health* 2021;8:1639-45.