KNOWLEDGE, ATTITUDE AND PRACTICE ON DENGUE PREVENTION BETWEEN MEDICAL AND PSYCHOLOGY STUDENTS IN MEDICAL FACULTY OF UDAYANA UNIVERSITY, BALI

Jesline Vincent[1], Putu Ayu Asri Damayanthi[2], I Kadek Swastika[2], I Made Sudarmaja[2]

[1]Medicine and Doctor Profession, Medical Faculty of Udayana University, Denpasar, Bali

[2]Departement of Parasitology, Faculty of Medicine Udayana University, Denpasar, Bali

Email: jeslinevincent@yahoo.com

Abstract: **Dengue is a mosquito-borne viral infection that is still endemic in Bali. High number of dengue cases are reported annually with only limited data on dengue is available about knowledge, attitude and practices on dengue among students in Bali. The purpose of this study was to determine the differences in knowledge, attitudes, and practices on dengue prevention among medical and psychology students in Medical Faculty of Udayana, Bali. An analytic study with cross-sectional approach was conducted and 94 research sample taken by consecutive sampling technique. The results of this study showed that 62.7% of medical students and 76.7% of psychology students have good level knowledge of dengue. Also, both medical and psychology students have excellent level of attitude towards dengue prevention, 96.1% and 100% respectively. This study showed that only 19.6% of medical students and 9.3% of psychology students have good level of practice on dengue prevention. There were no significant differences on knowledge and attitude on dengue prevention between medical and psychology students. Meanwhile, it was found that there were significant differences on practice on dengue prevention between medical and psychology students in Medical Faculty of Udayana University, Bali.**

Keywords: **Dengue prevention; University students; Knowledge; Attitude; Practice; Bali.**

1. INTRODUCTION

Dengue is a mosquito-borne viral infection which is an infectious disease. The virus is transmitted by a type of mosquitoes, *Aedes aegypti* and *Aedes albopictus* that bites during daylight hours. They are mostly active during daylight and few hours before the sunsets. The infection causes flu-like illness, and occasionally develops into a potentially lethal complication called Dengue Haemorrhagic Fever. The global incidence of dengue has grown dramatically in recent decades. About half of the world's population is now at risk. Dengue is found in tropical and sub-tropical climates worldwide, mostly in urban and semi-urban areas. Severe dengue is a leading cause of serious illness and death among children in some Asian and Latin American countries.[1]

Since the start of the 21st century, dengue fever (DF) has been the most critical vector-borne arboviral sickness in people, happening essentially in tropical and sub-tropical nations where more than 2.5 billion individuals are in danger of disease. With an expected 50– 100 million dengue contaminations around the world, the malady is at present endemic in excess of 125 nations in Africa, the Americas, the Eastern Mediterranean, South-east Asia, and the Western Pacific.[2]

 Indonesia is the second most endemic nation in Southeast Asian horribleness and death rate after Thailand. Occurrence rate (IR cases/10,000 populace) in 2003 was expanded until 2007, with case crest in January and February. Control has

been led mind achievements pointer of most extreme IR 2/10,000, case casualty rate (CFR) < 1% and hatchling – free rate 95% . However, the occurrence has been extended to the zones beforehand free from DHF. There were 330 urban areas or locale tainted in 2006 and it have been expanded to 335 urban communities in 2007.[3]

An as of late distributed examination in PLOS Neglected Tropical Diseases was intended to uncover contamination rates for the whole urban children populace in Indonesia. It is discovered that 69.4 percent of all children tested positive for dengue antibodies; 33.8 percent of 1-4 years old, 65.4 percent of 5-9 years old, 83.1 percent of 10-14 years old, and 89.0 percent of 15-18 years old tested positive. Also, the scientists figured that overall, 13.1 percent of children get their first dengue disease every year. Furthermore, the more individuals in a family unit who had been determined to have dengue since a youngster's introduction to the world, the more probable the children were to test positive for dengue antibodies.[4]

Bali, an Indonesian island located in the westernmost end of Lesser Sunda Islands, lying between Java to the west and Lombok to the east. Bali is a major travel destination and attracts visitors from many countries, predominantly from the Asia-Pacific and ASEAN regions where dengue burden is the highest globally. The continuing annual growth increase in visitor arrivals into Bali indicates there is a high likelihood that novel DENV lineages will continue to be introduced into Bali. A high number of dengue cases are reported annually in Bali. As per Ministry of health, the frequency rate of DHF in Bali Province in 2007 was 193 for every 100,000 inhabitants and is the most astounding number since DKI Jakarta which added up to 392 for each 100,000 populace.[5]

Knowledge and behaviour towards dengue are very important as it may help to prevent dengue transmission. There are several studies proved that have proved people with higher level of knowledge about dengue, tend to show positive behaviour towards act of preventing dengue, but not in all cases. According to a study conducted among students, showed that most of the students had poor or average knowledge of dengue fever even though they had various awareness campaigns in school. It is important to have educational programs such as developing student's friendly and continuous information regarding dengue fever as part of health promotion strategies and the needs of holistic approach, community participation and cooperation in order to confer information good practices in the prevention of dengue not only in the campus but among the community also.[6]

Knowledge may influence the behaviour towards dengue prevention. This is because prevention is always better than cure. As the rate of dengue cases and the deaths caused by it, alternative ways are needed for this infectious disease to be controlled. It is very important to prevent this disease by practicing some methods because prevention is always better than cure. One single step or very simple change in daily lifestyle can contribute as a way of prevention of this disease. Previous studies on knowledge, attitude and practice on dengue prevention have mostly included medical and dentistry students, university students in general, health care workers, patients and community-based samples. There is not much data on dengue prevention knowledge, attitude and practice among psychology students. Psychology students study the theories resulting from the scientific method of research. According to study conducted among medical students in Malaysia, it stated that for a study of knowledge and attitude on dengue fever and practice on preventive measures, taking medical students as a baseline and the results will help to provide some information of the general public on dengue fever.[7] Taking psychology students as sample for a study, will help to evaluate the knowledge, attitude and practice among students whom are from medical faculty but not from medical, dental and nursing as usual.

Therefore, this study is designed to get information and evaluate the differences on knowledge, attitude and practice towards dengue prevention between medical and psychology students in Faculty of Medicine, Udayana University, Bali.

2. MATERIALS AND METHODS

This study is a analytic cross-sectional study to evaluate the differences on knowledge, attitude and practice towards dengue prevention between medical and psychology students in Faculty of Medicine, Udayana University, Bali. This study uses primary data in the form of questionnaires based on the previous studies and some contents are modified according to this research. The target population in this study were students from Faculty of Medicine, Udayana University, Bali. The specific population in this study were Medical and Psychology students from semester 7 in Faculty of Medicine, Udayana University, Bali. Samples were taken from specific populations based on inclusion criteria and exclusion criteria. The inclusion criteria were Medical and Psychology students from semester 7 in Faculty of Medicine, Udayana University, Bali who are willing to be the subject of research and sign informed consent. The exclusion criteria were Medical and Psychology students who did not complete the online survey. The sample collection in this study was carried out by minimum sampling that must be met is 82 samples. The data that has been collected is carried out with

univariate descriptive and bivariate analysis using SPSS Windows Version 26.0. Through univariate analysis, the results of the study are then presented in the form of frequency distributions and percentages. Bivariate analysis was used to see the differences between knowledge, attitude, and practice towards dengue prevention based on the study program in the form of the Spearman's correlation test. This research has received ethical eligibility permission from the Research Ethics Commission (KEP) of the Faculty of Medicine, Udayana University.

3. RESULTS

Research on the differences of knowledge, attitude, and practice towards dengue prevention has been carried out since January 2020-November 2020 on students of the Faculty of Medicine, Udayana University, Bali. During the data collection period, 94 respondents were willing to take part in the research by filling up the questionnaire via Google Forms. Demographic variables of respondents consisting of age, gender, study program at the Faculty of Medicine, Udayana University, history of dengue infection, and family history of dengue infection were carried out to obtain a description of the characteristics of the respondents, the frequency distribution and percentage of respondents. Through univariate analysis, the results of the study are then presented in the form of frequency distributions and percentages. Furthermore, to see the differences between knowledge, attitude, and practice towards dengue prevention based on the study program was carried out through a bivariate analysis in the form of the Spearman's correlation test.

The demographic distribution of the respondents is shown in Table 1. Out of the 94 respondents, the average age of respondents were 21 years old. The lowest age range was 20 years old and the highest age range was 24 years old. Then, the researcher transformed the data on the age variable into dichotomous categories based on the cutoff point obtained through the median value. After analysis, the age cut point was 21 years. Respondents aged below or equal to 21 years old were found to be higher than the group of respondents over 21 years of age, 83% and 17%, respectively. Out of 94 respondents, 78 of them were female (83%). From the analysis, this study found that respondents were dominated by female respondents. The subjects of this study were students of Faculty of Medicine, Udayana University, who were grouped into 2 categories of study programs, medical and psychology study program respectively. From the results of the univariate analysis, it was found that there were 54.3% of respondents from the medical study program and 45.7% of the psychology study program. Researcher found that respondents from the medical study program had a higher percentage than respondents from the psychology study program. There were 28.7% of respondents who had a previous history of being infected with dengue, while 71.3% of respondents did not have a history of being infected. Although the percentage of respondents who had never been infected with dengue was higher than that of respondents who had been infected with dengue, more than 20% of respondents had been infected with dengue showed a fairly high number. Based on the results of univariate analysis of the history of dengue infection in the respondent's family, 41.5% of respondents had a previous family history of dengue infection, while 58.3% of respondents did not have a family history of dengue infection. The percentage of respondents without a history of dengue infection in the family is higher than respondents with a history of dengue infection in their family.

Table 1: Respondent Characteristics

Characteristics	Number (n)	Percentage (%)
Age		
≤ 21	78	83
> 21	16	17
Gender		
Male	16	17
Female	78	83
Study programme		
Medical (PSSKPD)	51	54.3
Psychology	43	45.7
Dengue History		
Yes	27	28,7
No	67	71,3
Family History of Dengue		
Yes	39	41,5
No	55	58,5

Differences of Respondent's Knowledge of Dengue Prevention Based on Study Program

In this study, the respondent's knowledge level was measured by a questionnaire with 4 levels, excellent, good, adequate and poor knowledge of dengue prevention. Analysis was carried out between the level of knowledge of dengue prevention, which was differentiated based on the study program of the respondents. In the univariate analysis, it was found that 31.4% of respondents had excellent level of knowledge about dengue prevention from the medical study programme. These results indicate a higher percentage than respondents from the psychology study program. When viewed from the parameter category of the level of knowledge that is classified as poor on dengue prevention, none of the respondents fall into this category. The results of this analysis indicate that almost all respondents have a fairly good level of knowledge, which is above the level of poor knowledge. Furthermore, through the bivariate analysis with the chi-square proportion difference test, it was found that there was no significant difference between the level of knowledge of dengue prevention among students of the medical study program and students of the psychology study program with a value of p> 0.05 (p = 0.330) (Table 2)

Table 2: Differences of Respondent's Knowledge of Dengue Prevention Based on Study Program

Study Program	Knowledge Level								p
	Excellent		Good		Adequate		Poor		
	n	%	n	%	n	%	n	%	
Medical	16	31.4	32	62.7	3	5.9	0	0	0.330
Psychology	8	18.6	33	76.7	2	4.7	0	0	

Differences of Respondent's Attitude of Dengue Prevention Based on Study Program

Based on the univariate analysis of the respondent's attitude which is differentiated from the study program, it is found that 100% of the respondents from the psychology study program have excellent attitude. This percentage is higher than the percentage of medical students, although based on absolute values, respondents from the medical study program dominate. Similar to the correlation between the level of knowledge and the prevention of dengue based on the study program, the correlation of the respondent's attitude towards dengue prevention based on the study program also shows that none of the respondents fall into the poor attitude category. Based on the bivariate analysis, through the analysis of different proportions of chi square, the difference in the percentage of attitudes towards dengue prevention between medical study program respondents and psychology study program respondents did not show a significant difference with p value> 0.05 (p = 0.423) (Table 3)

Table 3: Differences of Respondent's Attitude of Dengue Prevention Based on Study Program

Study Program	Knowledge Level								p
	Excellent		Good		Adequate		Poor		
	n	%	n	%	n	%	n	%	
Medical	49	96,1	1	2	1	2	0	0	0,423
Psychology	43	100	0	0	0	0	0	0	

Differences of Respondent's Practice of Dengue Prevention Based on Study Program

Based on the univariate analysis of the respondent's practice which was differentiated from the study program, it was found that 19.6% of the respondents from the medical study programme had relatively good practices. This percentage is higher than the percentage of psychology respondents. However, the percentage of practice towards dengue prevention among medical students who were in the bad category also dominated, namely 51%. This percentage is higher than the psychology students which is only 30.2%. Based on the bivariate analysis, through the analysis of different proportions of chi square, the difference in the percentage of practice on dengue prevention between medical study program respondents and psychology study program respondents showed a significant difference with p value <0.05 (p = 0.010) (Table 4)

Table 4: Differences of Respondent's Practice of Dengue Prevention Based on Study Program

Study Program	Practice								p
	Excellent		Good		Adequate		Poor		
	n	%	n	%	n	%	n	%	0,010*
Medical	0	0	10	19,6	15	29,4	26	51	
Psychology	0	0	4	9,3	26	60,5	13	30,2	

4. DISCUSSION

This study evaluated the level of knowledge, attitude and practice of dengue prevention among the students Faculty of Medicine, Udayana University, Bali. Correlation of knowledge, attitude and practice on dengue prevention based on programme of study was additionally included in this study. Complete score of knowledge, attitude and practice of the students were investigated to decide the level of those three segments.

Knowledge Level of Dengue

The final results of this study obtained an interpretation that there was no significant difference between the level of knowledge of dengue prevention among students of the medical study program and students of the psychology study program, with mostly good level of knowledge on dengue and no poor level of knowledge among the subjects. This contrasted with a similar study about knowledge, attitude and practice towards dengue fever prevention among Health Care Practitioners in Ethipoia, which showed that 49.3% of the participants had moderate level of knowledge and reported very low level of knowledge regarding *Aedes* mosquito feeding time. The results of this study were inconsistent with a study by Ali et al, which stated there was a statistically significant difference (P < 0.001) in dengue knowledge among pharmacy, medicine and dental students.[8] As the scores were observed among all three programmes of study, the pharmacy students scored the better with 58% good score, medicine student with 57% and dentistry 45% which was moderate score.

In this study, according to the responses about the knowledge, majority of respondents from both medical and psychology programmes answered falsely that dengue is not an infectious disease. 30 out 51 medical students (58.8%) answered that dengue is not an infectious and 34 out 43 psychology students (79%) answered the same. Meanwhile, majority of the respondents could answer correctly about the vector of dengue. Even though most of know about the vector, about 53.4% of psychology students showed that they do not know whether the adult *Aedes* mosquito can transmit the dengue virus to its eggs.

According to World Health Organization, one of the major methods to prevent the transmission of dengue virus is by preventing the mosquito breeding.[9] This study also found that the respondents showed lack of knowledge about the breeding site of the *Aedes* mosquitoes. There are 27 medical students (52.9%) and 31 psychology students (72%) stated that *Aedes* mosquitoes breed in dirty water which shows that most of them did know that *Aedes* mosquitoes breed in clean water. Besides that, most of the respondents could answer correctly regarding the common symptoms of dengue, method of prevention of spreading and peak biting time of *Aedes* mosquito.

Attitude Level of Dengue Prevention

For attitude towards dengue prevention, the scores were observed in both the programme of study and both are in excellent level with 96.1% and 100% respectively. Therefore, based on the bivariate analysis, through the analysis of different proportions of chi square, the difference in the percentage of attitudes towards dengue prevention between medical study program respondents and psychology study program respondents did not show a significant difference with p value> 0.05 (p = 0.423). According to an almost similar study conducted by Al-Zurfi et al in Malaysia, stated that about 80% of the respondents had good attitude towards dengue fever.[10] According to almost similar study in Aceh, Indonesia by Harapan et al only 32.1% had a good attitude regarding dengue fever and also factors such as education and personal history of dengue fever were associated with it.[11] However, finding of this study was similar to the attitude of respondents of study conducted in Malaysia by Nasarudin et al.[12]

Besides both the programme of study respondents showed excellent attitude level towards dengue prevention, few respondents from medical study programme were not sure about whether family members should spend some time during the weekends to remove *Aedes* breeding sites. Nevertheless, all the respondents completely agreed that they will take their family members to the doctor for immediate treatment if they have symptoms of dengue fever.

Practice Level of Dengue Prevention

For practice of dengue prevention, non- of the respondents from both the programme of study had excellent level of practice on dengue prevention. The results showed that the majority percentage of practice of medical students was in poor level compared to the psychology students. About 60.5% of psychology students had adequate level of practice on dengue prevention and 29.4% of medical students had adequate level of practice on dengue prevention. Therefore, based on the bivariate analysis, through the analysis of different proportions of chi square, the difference in the percentage of

practice on dengue prevention between medical study program respondents and psychology study program respondents showed a significant difference with p value <0.05 (p = 0.010). These findings are supported by a study by Al-Zurfi et al, where the study showed that a total of 74.0% of students have poor practices towards dengue fever.[10] Also, these findings were inconsistent with previous study conducted by Nasarudin et al.[12] Where the respondents showed a good level of practice towards dengue. This finding is consistent with those of a previous study in Aceh, Indonesia by Harapan et al, only 32% had good preventive practice which was a week association of knowledge and practice in that particular study.[11]

In this study, it was found that only 2 out 51 medical students check for the presence of *Aedes* eggs and larvae inside the house every day and non-of them from the psychology programme checks for it every day. Furthermore, 23 respondents from each study programmes stated that they scrub inner wall of their water storage at least once a every week and only few of them scrub inner wall of their water storage every day. Moreover, 25 respondents (58.1%) from medical programme and 19 respondents (44.1%) from psychology programme stated that they never add larvicide into water storage containers. Also, few of them initiated to add larvicide into water storage container at least once a month.

According to a previous study, people would close their windows and doors if they knew that *Aedes* mosquito only bites during after dawn and before dusk and some people would let their windows and doors open in the morning after dawn because they assume that *Aedes* mosquito only active at night.[12] Surprisingly, majority of the respondents which is about 76.4% medical students and 81.4% of psychology students open their windows early in the morning after dawn every day. It is also found that, about 47% of medical students use aerosol and/or liquid mosquito repellent and/or electrical mosquito mat and/or mosquito bed nest in a daily basis and about 32.5% from psychology programme use it too every day too.

This study used a cross-sectional research design and the total sample was 94 respondents. Based on the analysis of the responses, the respondents seemed to believe that attitude towards dengue prevention plays major role as they have recorded an excellent level of attitude. Moreover, the respondents have scored fairly good level of knowledge on dengue prevention. Commonly, the respondents from both the study programme did not achieve excellent level when it comes to practice on dengue prevention. Only 19.6% of medical students and 9.3% of psychology students had good level of practice towards dengue prevention

5. CONCLUSION

Based on the research results, the following conclusions can be obtained; there are no significant differences on knowledge about dengue prevention between medical and psychology students in Faculty of Medicine, Udayana University, Bali; there are no significant differences on attitude towards dengue prevention between medical and psychology students in Faculty of Medicine, Udayana University, Bali; there are significant differences on practice towards dengue prevention between medical and psychology students in Faculty of Medicine, Udayana University, Bali, it is seen that medical students have higher level of good practices on dengue prevention.

6. RECOMMENDATION

Further relative research should be done with a more bigger sample size and with varied location of research. Furthermore, more studies and promotions regarding practices on dengue prevention should be carried out as it may help in preventing dengue infection in a bigger way.

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