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Comparison of Mean Knowledge on Age, Location and Education Level towards Dengue Fever Prevention

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Abstract
The World Health Organization and Centers for Disease Control and Prevention (CDCP) recommends extensive community educational campaigns that emphasize reducing vector breeding sites as an effective way of dengue prevention. Several studies suggest that better knowledge of dengue and dengue vector prevention practices among people was one of the predictors of better practices of dengue prevention. The purpose of this study was to find the comparison of mean knowledge on age, location and education level towards dengue fever prevention. The study design was a cross sectional study with concerning the knowledge, attitude and practices of the dengue fever prevention among the people in Perak Tengah district, Perak. ANOVA (Analysis of Variance) was engaged in this study to find the difference on mean knowledge between education, age and location. We found that all variables (age, location and education) were statistically significant difference on mean knowledge since the p-value was less than 0.05. For age, the mean knowledge shows that there were significant difference on age 41 until 50 years old and age below 20 years old using post-hoc test Bonferroni's procedures. Other than that, for mean knowledge there was statistically significant difference on variable location [F-statistic (df): 6.643 (5,194)] with the p-value less than 0.001. Finally, there were statistically significant difference on mean knowledge between education levels [F-statistic (df): 3.677 (6,193)] with the p-value equal to 0.002. As a conclusion strengthening the public health measures at local place would protect the people as well as providing them an adequate knowledge about infectious disease control and develop the correct behaviour on health and prevention of disease.
Keywords: Knowledge, Dengue, Aedes, Prevention
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1. Introduction

Dengue fever (DF) is a mosquito-borne viral infection causing a severe flu-like illness and, sometimes causing a potentially lethal complication called severe dengue transmitted by bites of Aedes aegypti and Aedes albopictus mosquito (Heymann DL, 2004). Dengue fever (DF) is caused by any of four closely related viruses, or serotypes: DENV 1, DENV 2, DENV 3, and DENV 4. Symptoms of infection is characterized by characterized by a sudden onset of high fever (103-106°F), severe headache, backache, intense pain in joints and muscles, retro-orbital pain, nausea and vomiting and a generalized erythematous rash that usually begin 4-7 days after the mosquito bite and typically last 3-10 days (World Health Organization, 2009). However, infection with a dengue virus serotype can also produce a more complex and severe form of clinical manifestations like hemorrhage and shock. In the recent years dengue fever has become international global public health concern as there has a dramatic increase of cases of dengue in tropical and subtropical regions around the world, predominantly in urban and semi-urban areas. According to the World Health Organization, dengue fever in its severest form is a leading cause of serious illness and death among children in some Asian and Latin American countries -- is endemic in more than 100 countries. It is estimated that 50—500,000 cases of dengue fever occur worldwide (World Health Organization, 2009). Out of the 2.5 billion people at risk globally; about 1.8 billion or more than 70 percent of them live in the Asia-Pacific region (Guzman MG & Kouri G., 2003). Moreover,(Egger JR et al., 2008) claimed that the increment in dengue cases that spread both vector and viruses possibly due to growing levels of urbanization, and international trade and travel. In Malaysia, according to (Clinical Practice Guidelines, 2008) a total of 20 187 cases of dengue fever equal to 25 deaths reported between December 28, 2008 to May 16, 2009 as compared to 14840 cases of dengue for the same period of the previous year. The government of Malaysia has made guidelines with the aim to reduce the cases to only 50 cases per 100,000 populations a year since the 8th Malaysia Plan (2001-2005). The purpose of this study was to find the comparison of mean knowledge on age, location and education level towards dengue fever prevention.

2. Methodology

The study design was a cross sectional study with concerning the knowledge, attitude and practices of the dengue fever prevention among the people in Perak Tengah district, Perak. The population frame in this study was the residents of Perak, Malaysia who were living there for at least one year. The sampling frame for this study was the residents of Perak Tengah district, Perak who were living there for at least one year. This study was undertaken from May 2012 until May 2013. The inclusion criterions were all residents who living Perak Tengah district for at least one year and age between 18 and 60 years old. Sample size were based on single proportion formula which determined by $n = \frac{Z^2pq}{d^2}$; where **Z** is the reliability coefficient at 95% confidence interval (1.96); **d** is the acceptable error which is 5%; **p** is the proportion in the population processing the characteristics of interest and **q** is the complement of p which determined by (1-p). These proportions were taken from others study that had done in another district which were at Kuala Kangsar, Perak. The value of proportion used in this study was 64.1%. Thus the sample size would be 180.41≈181. However, considering estimated 10% of missing data (Naing, 2009; Whitley. E & Ball, 2002), the sample sizes were 200 respondents. The type I error probability associated with this test of the null hypothesis was 0.05 with the 80% power of the study. The questionnaire was tested before the study started and found to be reliable and valid (Abdullah., Azib, Harun, & Burhanuddin, 2013; Abdullah., Azib., Harun., & Burhanuddin., 2013). The convenience sampling methods were applied to select the respondents from sub-districts of Perak Tengah from Parit, Tanjung Belanja, Buluh Akar, Bota Kanan, Titi Gantung, Seri Iskandar and Kampung Gajah. The main software that used for data entry and data analysis were IBM SPSS (Statistical Software for Social Science) version 21 (IBM SPSS Statistics, 2012) and STATA (Statistics/data analysis) version 11 (StatCorp, 2009). At the beginning of the analysis, the data was checked and cleaned to avoid any missing data. The power of the study was set at 80% and the statistical significant level was 5%. ANOVA (Analysis of Variance) was engaged in this study to find the difference on mean knowledge between education, age and location. There were some assumptions need to be satisfied before execute it. The assumptions were population from which the samples were obtained must be normally or approximately normally distributed, the samples must be independent each others and the variances of the population must be equal (Bluman, 2009).

3. Results

Based on table 1, it shows that the difference mean knowledge of dengue fever prevention on age, location and education. The One Way Analyses Of Variance were employed to cater the variable with more than two levels. Before the test was conducted, all assumptions regarding One Way Analyses of Variance were tested and met the criteria. The levene's test (df) for mean knowledge on age was 1.653(4,195) and the p-value was 0.163. Thus, it shows that the variance were equal for variable age. Next, for mean knowledge on location, the levene's test (df) was 1.306(5,194) with the p-value equal to 0.263. This also indicated that the variance were equal for variable location. Lastly, for mean knowledge on education, the levene's test (df) was 2.666(6,193) with p-value equal to 0.017. This indicated that the variance for these variable were not equal. On the table 1, we found that all variables (age, location and education) were statistically significant difference on mean knowledge since the p-value was less than 0.05. For age, the mean knowledge shows that there were significant difference on age 41 until 50 years old and age below 20 years old using post-hoc test Bonferroni's procedures. The mean knowledge for age 41 to 50 years old was higher [mean (SD): 71.20 (14.48)] compared to age below 20 years old [mean (SD): 59.88 (16.13)].

Next, for mean knowledge there was statistically significant difference on variable location [F-statistic (df): 6.643 (5,194)] with the p-value less than 0.001. Further investigation was done by post-hoc test using Bonferroni's procedure. We found that there were significant difference on mean knowledge on people who live at Seri Iskandar and Titi Gantung. The Mean knowledge at Seri Iskandar was higher [Mean (SD): 67.75 (10.13)] compared to mean knowledge at Titi Gantung [Mean (SD): 59.70 (14.02)]. Then, there were significant difference on mean knowledge people who live at Tanjung Blanja and Bota Kanan. The Mean knowledge at Bota Kanan was higher [Mean (SD): 76.52 (9.27)] compared to mean knowledge at Tanjung Blanja [Mean (SD): 56.04 (13.30)]. Furthermore, there were significant difference on mean knowledge people who live at Parit and Bota Kanan. The Mean knowledge at Bota Kanan was higher [Mean (SD): 76.52 (9.27)] compared to mean knowledge at Parit [Mean (SD): 60.87 (13.43)]. Lastly, there were significant difference on mean knowledge people who live at Titi Gantung and Bota Kanan. The Mean knowledge at Bota Kanan was higher [Mean (SD): 76.52 (9.27)] compared to mean knowledge at Titi Gantung [Mean (SD): 59.70 (14.02)].

Finally, there were statistically significant difference on mean knowledge between education levels [F-statistic (df): 3.677 (6,193)] with the p-value equal to 0.002. Additional examination was conducted using post-hoc test with Bonferroni's procedure, we found that there were statistically significant difference on mean knowledge with people whose education level were UPSR and Degree. The mean knowledge on Degree level education were significantly higher [Mean (SD): 69.89 (10.15)] compared to UPSR [Mean (SD): 51.55 (23.87)].

4. Discussion

All variables (age, location and education) were statistically significant difference on mean knowledge since the p-value was less than 0.05. For age, the mean knowledge shows that there were significant difference on age 41 until 50 years old and age below 20 years old using post-hoc test Bonferroni's procedures. Other than that, for mean knowledge there was statistically significant difference on variable location [F-statistic (df): 6.643 (5,194)] with the p-value less than 0.001. Finally, there were statistically significant difference on mean knowledge between education levels [F-statistic (df): 3.677 (6,193)] with the p-value equal to 0.002.

5. Conclusion

Dengue fever has already become a global challenge and become a burden not only local society but also to worldwide. Strengthening the public health measures at local place would protect the people as well as providing them an adequate knowledge about infectious disease control and develop the correct behaviour on health and prevention of disease. Disseminating health message through health education is very important to all level of citizens especially on young age as the learning health-related knowledge, attitude and practice should begins at early ages.

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TABLE 1. MEAN KNOWLEDGE OF DENGUE FEVER PREVENTION (n=200)

Variable	n	Mean (SD)	F-statistic[a] (df)	P-value
Age				
Below 20 yrs	35	59.88 (16.13)		
21 to 30 yrs	79	65.05 (10.24)		
31 to 40 yrs	31	68.72 (12.67)		
41 to 50 yrs	24	71.20 (14.48)	3.793 (4,195)	0.005[b]
More 51 yrs	31	62.27 (14.48)		
Location				
Kg Gajah	20	66.30 (16.50)		
Seri Iskandar	84	67.75 (10.13)		
Parit	31	60.87 (13.43)		
Tanjung Blanja	9	56.04 (13.30)	6.643 (5,194)	<0.001[c]
Titi Gantung	41	59.70 (14.02)		
Bota Kanan	15	76.52 (9.27)		
Education				
UPSR	7	51.55 (23.87)		
PMR	8	71.74 (14.89)		
SPM	75	63.48 (13.41)		
STPM	10	61.30 (13.20)		
Diploma	37	64.86 (11.75)	3.677 (6,193)	0.002[d]
Degree	53	69.89 (10.15)		

a. One way ANOVA test
b. Only mean knowledge who age “41 until 50 years and below 20 years” pairs were significant different by post-hoc test Bonferroni’s procedures.
c. Only mean knowledge who live “Seri Iskandar and Titi Gantung”, “Tanjung Blanja and Bota Kanan”, “Parit and Bota Kanan” and “Titi Gantung and Bota Kanan” pairs were significant different by post-hoc test Bonferroni’s procedures.
d. Only mean knowledge who have education “UPSR and Degree” pair were significant different by post-hoc test Bonferroni’s procedures.