UNIVERSITI PUTRA MALAYSIA

KNOWLEDGE, ATTITUDE, AND PRACTICE ON PREVENTION OF DENGUE AMONG POSTGRADUATE INTERNATIONAL STUDENTS IN A PUBLIC UNIVERSITY IN MALAYSIA

LUAM GHEBREHIWOT GHEBREAB

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Dissertation Submitted to the Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia in Fulfillment of the Requirements for the Degree of Master of Public Health

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Chairman : Dr. Huda Zainuddin, MPH
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Introduction: Dengue infection is one of the major vector-borne diseases and has become a public health concern throughout the world. Dengue fever has also become a burden among outsiders who travel to dengue endemic countries.

Objective: This study aims to identify the level of knowledge, attitude and practice on prevention of dengue infection among postgraduate international students in Universiti Putra Malaysia, Serdang and its predictors.

Methodology: A cross-sectional study was conducted among the postgraduate international students enrolled full-time in UPM using a multi-stage random sampling and proportionate to the number of students from each selected faculty. Data were collected using validated and self-administrated questionnaire. The collected data was computed and analyzed using IBM Statistical Package for Social Science (SPSS) version 22. Inferential statistics was used to assess the association between categorical variables using either Chi-Square or Fisher's exact test. The final models for predictors of good knowledge, attitude and practice were analyzed using logistic regression analyses. All the associations and predictors were considered significant at *P* less than 0.05.

Result: There were a total of 327 international students with 93.4% response rate. Majority of the students were male (70.3%), single (51.1%), master (56.3%) and Asians (52.3%) with median age of 32 (IQR 10). Most of the respondents showed good knowledge (69.7%), positive attitude (51.4%) and poor practice (60.9%) with 77.7% of the students having high perceived influence of mass media towards dengue infection.

Predictors of good knowledge were being a female (aOR = 2.236, 95% CI = 1.242 – 4.025, *P* = 0.007), respondents with history of dengue previously (aOR = 12.751, 95% CI =1.674 – 97.136, *P* = 0.007), those who stayed more than 18 months (aOR = 2.005, 95% CI = 1.240 – 3.242, *P* = 0.007) and respondents with high influence of mass media (aOR= 3.076, 95% CI = 1.784 – 5.572, $P \leq 0.001$). Predictors of positive attitude were, respondents older than 31-year-old (aOR = 1.718, 95% CI = 1.074 – 2.747, *P* = 0.024), high influence of mass media (aOR = 2.236, 95% CI = 1.242 – 4.025, *P* = 0.007), living in endemic country (aOR = 1.796, 95% CI =1.055 – 3.055, *P* = 0.031) and respondents from Africa (aOR = 0.443, 95% CI = 0.262 – 0.748, *P* = 0.002). Africans (aOR = 0.477, 95% CI = 0.270 – 0.845, *P* = 0.011) and participants with positive attitude (aOR = 2.928, 95% CI = 1.758 – 4.877, $P < 0.001$) were predictors of good practice.

Conclusion: The outcome of this study showed poor practice level of prevention on dengue, despite the respondents having an average level of knowledge and positive attitude. Hence, knowledge and attitude should be strengthened through the most utilized sources of information by giving ongoing health education and organizing campaigns regarding dengue preventive practices.

Key Words: Knowledge, Attitude, Practice, Dengue Infection, International students.

Abstrak disertasi yang dikemukakan kepada Jabatan Kesihatan Komuniti,
Universiti Putra Malaysia sebagai memenuhi keperluan untuk
Ijazah Sarjana Kesihatan Awam

PENGETAHUAN, TINGKAHLAKU, DAN AMALAN DALAM PENCEGAHAN DENGGI DI KALANGAN PELAJAR PASCA SISWAZAH DI UNIVERSITI AWAM DI MALAYSIA

Oleh

LUAM GHEBREHIWOT GHEBREAB

Ogos 2017

Pengerusi : Dr. Huda Zainuddin, MPH
Fakuliti : Perubatan dan Sains Kesihatan

Pengenalan: Demam denggi adalah salah satu penyakit bawaan vektor utama yang telah menjadi satu isu kesihatan awam yang membimbangkan di seluruh dunia. Deman denggi juga telah menjadi beban orang luar yang mengunjungi negara endemik.

Objektif: Kajian ini bertujuan untuk menentukan tahap pengetahuan, sikap, dan amalan pencegahan demam denggi serta peramal kepada pengetahuan yang baik, sikap dan amalan mengenai pencegahan jangkitan Denggi di kalangan pelajar antarabangsa pasca siswazah di Universiti Putra Malaysia, Serdang.

Metodologi: Kajian hirisan lintang telah dijalankan di kalangan pelajar antarabangsa sepenuh masa menggunakan persampelan rawak pelbagai peringkat dan berkadaran dengan saiz dari setiap fakulti yang dipilih. Data dikumpul dengan menggunakan borang soal selidik yang disi sendiri. Data yang dikumpul telah dikira dan dianalisa menggunakan IBM Statistical Package for Social Science (SPSS) versi 22. Statistik inferensi digunakan untuk mengukur hubungan antara pembolehubah menggunakan ujian Chi-Square atau ujian Fisher's Exact. Model akhir bagi peramal pengetahuan yang baik, sikap dan amalan telah dianalisa menggunakan ujian regresi logistik. Hubungan pembolehubah dan peramal dianggap signifikan pada *P* kurang daripada 0.05.

Keputusan: Terdapat sejumlah 327 pelajar antarabangsa dengan kadar respons 93.4%. Majoriti pelajar ialah lelaki (70.3%), bujang (51.1%), jurusan sarjana (56.3%) dan berasal dari negara Asia (52.3%) dengan median umur 32 (IQR 10). Kebanyakan responden menunjukkan pengetahuan yang baik (69.7%), sikap positif (51.4) dan

amalan tidak baik (39.1) terhadap pencegahan jangkitan denggi dengan 77.7% daripada pelajar mempunyai pengaruh tanggapan media massa yang tinggi terhadap jangkitan virus denggi. Peramal kepada pengetahuan pencegahan denggi yang baik termasuk sebagai wanita (*adjusted odds ratio* (aOR = 2.236, 95% CI = 1.242 – 4.025, $P = 0.007$), responden yang mempunyai sejarah denggi sebelum ini (aOR = 12.751, 95% CI = 1.674 – 97.136, $P = 0.007$), mereka yang tinggal di Malaysia lebih daripada 18 bulan (aOR = 2.005, 95% CI = 1.240 – 3.242, $P = 0.007$) dan responden dengan pengaruh media massa yang tinggi (aOR = 3.076, 95% CI = 1.784 – 5.572, $P \leq 0.001$). Peramal kepada sikap positif termasuk responden berumur lebih daripada 31 tahun (aOR = 1.718, 95% CI = 1.074 – 2.747, $P = 0.024$), pengaruh media massa yang tinggi (aOR = 2.236, 95% CI = 1.242 – 4.025, $P = 0.007$) dan tinggal di negara endemik (aOR = 1.796, 95% CI = 1.055 – 3.055, $P = 0.031$) dan responden dari Afrika (aOR = 0.443, 95% CI = 0.262 – 0.748, $P = 0.002$). Orang Afrika (aOR = 0.477, 95% CI = 0.270 – 0.845, $P = 0.011$) dan responden dengan sikap positif (aOR = 2.928, 95% CI = 1.758 – 4.877, $P < 0.001$) adalah peramal kepada amalan yang baik.

Kesimpulan: Hasil kajian menunjukkan tahap amalan masih rendah bagi pencegahan denggi, walaupun responden mempunyai tahap pengetahuan dan sikap positif yang sederhana. Oleh itu, tahap pengetahuan dan sikap positif perlu diperkukuhkan melalui pendidikan kesihatan berterusan dan penganjuran kempen mengenai amalan pencegahan demam denggi.

Kata Kunci: Pengetahuan, Sikap, Amalan, Demam Denggi, pelajar antarabangsa

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I certify that a dissertation Examination Committee has met on 2nd August 2017 to conduct the final examination of Luam Ghebrehiwot Ghebreab on her dissertation entitled "Knowledge, Attitude, and Practice on Prevention of Dengue among Postgraduate International Students in a Public University in Malaysia" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the (insert the name of relevant degree).

Members of the Dissertation Examination Committee were as follows:

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This dissertation was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Master of Public Health. The members of the Supervisory Committee were as follows:

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Declaration by Members of Supervisory Committee

This is to confirm that:

- the research conducted and the writing of this dissertation was under our supervision;
- supervision responsibilities as stated in the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2012 – 2013) are adhered to.

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LIST OF ABBREVIATIONS

aOR	Adjusted Odds Ratio
CAM	Complementary and Alternative Medicine
CI	Confidence Interval
cOR	Crude Odds Ratio
Df	Degree of Freedom
DHF	Dengue Hemorrhagic Fever
DSS	Dengue Shock Syndrome
DV	Dependent Variable
IgG	Immunoglobulin G
IgM	Immunoglobulin M
IQR	Inter Quartile Range
IV	Independent Variable
IVM	Integrated Vector Management
JKEUPM	Ethical Committee for Research Involving Human Subjects of Universiti Putra Malaysia
Kg	Kilogram
Ml	Milliliter
N	Sample Size
N	Number
NS1	Non-Structural Protein 1
Ph.D.	Doctor of Philosophy
RNA	Ribonucleic Acid
RT-PCR	Reverse Transcription-Polymerase Chain Reaction
SD	Standard Deviation
SPSS	Statistical Package for Social Science
UPM	Universiti Putra Malaysia
IVF	Variance Inflation Factor
WBC	White Blood Cells
WHO	World Health Organization
χ^2	Chi Square

CHAPTER 1

INTRODUCTION

1.1 Background

Dengue infection is one of the major vector-borne diseases transmitted from one person to another person through an infected mosquito bite. The *Aedes aegypti* is the primary vector for the dengue infection followed by the *Aedes Albopictus*. The infection is caused by the dengue fever virus, an RNA virus belonging to the *flaviviridae* family, *flavivirus* genus. There are 4 serotypes of the virus identified, DEN-1, DEN-2, DEN-3, DEN-4 (WHO, 2009). Once infected, symptoms vary from simple flu-like to severe dengue infection, which might result in shock caused by dengue hemorrhagic fever or dengue shock syndrome. It is transmitted from one infected individual to another when bitten by an infected mosquito (WHO, 2016c).

From the reports World Health Organization (WHO) released in 2012, the global incidence of dengue fever has shown a dramatic 30-fold increase over the past 50 years and it remains a major public-health concern throughout tropical and sub-tropical regions of the world (WHO, 2012a). As per the World Health Organization (2016), it is estimated that 50–100 million dengue infections occur annually with almost half the world's population living in countries where dengue is endemic.

It is estimated that up to 75% of the population living in the Asia-Pacific region are potentially exposed to the disease with this steady increase in incidence (WHO, 2012a). Economic and disease burden of dengue in Southeast Asia study at the 95% certainty level limits attained estimate for the total number of cases and the unit cost per dengue episode, it obtained an overall annual economic burden of dengue of US$ 950 million (US$ 610million – US$ 1,384million (Shepard, Undurraga, & Halasa, 2013)

The proper knowledge and attitude of dengue control, prevention, and management of the disease becomes a concern specifically to those living in dengue endemic areas. The Merriam-Webster dictionary defines knowledge as: "the state of being aware of information, understanding, or skill that you get from experience or education". The dictionary also defined prevention as: "the act or practice of stopping something bad from happening". Prevention programs are more effective if the knowledge and vector control practices of the population are understood and applied in the mainstream of intervention activities (Al-dubai et al., 2013). Furthermore, several studies suggest better knowledge of dengue and vector prevention practices as predictors of efficacy of dengue prevention (Alobuia, Missikpode, & Aung, 2016; Itrat et al., 2008).

Regarding general knowledge, attitude, and practices of dengue infection in Malaysia, a nationwide survey among Malaysians was conducted by Wong et al. The study results were, the mean total knowledge score for the overall sample was 27.49 (SD ± 8.34), out of a possible score of 42 which was moderate, though most the participants; 72.8% had a total dengue prevention practice score in the range of 51–100. Respondents with a lower total knowledge score range were less likely to have higher score practice on dengue prevention (OR = 0.42; 95% CI = 0.34 – 0.51; *P* = 0.001), thus the researchers concluded that there is a need of extensive dengue educational campaigns among people who have poor knowledge of dengue in order to encourage dengue prevention and control practices (Wong, Shakir, Atefi, & AbuBakar, 2015). Another cross-sectional survey among 300 Malaysians in different geographical locations (urban, semi-urban and rural) showed 96% of the participants were either not afraid of the disease or were unaware of its complications. Moreover, their practice was associated significantly with knowledge on dengue fever (*P* = 0.030) (Radman, S. A., Rahman, & Ahmed, 2013).

Dengue is also one of the top public health problems with an escalating rate on those individuals who are traveling to the endemic area. Dengue infection is as well the leading cause of febrile illness among international travelers which accounts for up to 16% of all febrile illnesses in returned travelers from dengue endemic or non-endemic countries (Ratnam, Leder, Black, & Torresi, 2013). Two percent of all illness in travelers returning from dengue-endemic regions is caused by dengue infection (Wilder-Smith, 2013). Ericsson et al also reported that the incidence of dengue in international travelers is rising which could be explained by the increasing number of tourists and other visitors visiting the dengue-endemic regions. The incidence rate of dengue among travelers is 14.6 per 1,000 person-months according to one study among travelers from Netherlands (Baaten et al., 2011), imported most commonly from South-east Asia (51%) (Schwartz et al., 2008).

The good knowledge, attitude and practice of prevention are the mainstay of reducing dengue among international visitors and locals. However, the international students in Universiti Putra Malaysia (UPM), Serdang had poor knowledge (45.9%), showed negative attitude (51.6%) and relatively moderate good practices on dengue fever prevention (53.7%) and the significant predictor for poor practices were negative attitudes towards practice, and poor knowledge on dengue fever (aOR=3.705, 95% CI = 2.532 – 5.421, *P* < 0.001) and (aOR = 0.169, 95% CI = 0.090 – 0.319, *P* < 0.001) respectively (Rao,Minhat & Hayati, 2016). In this study among international students, the authors identified the predictors of poor practice, but associated factors of good knowledge and attitude of students towards dengue infection prevention was not reported, which is an important component needed to be studied. In general, the UPM students lack comprehensive knowledge and had poor practices on dengue infection prevention (Rahim, Olivia & Rafee, 2016). Since there are considerable numbers of international students in the UPM, there is a need to explore the current prevalence and the associated aspects related to knowledge, attitude and practice of dengue fever prevention.

1.2 Problem Statement

The global incidence of dengue increased significantly within the past two decades. The number of symptomatic dengue infections more than doubled every 10 years in between 1990 to 2013 giving estimated incidence range of 50 million to 100 million cases per year. The number of cases increased from 8.3 million (95% CI = 3.3 million – 17.2 million) cases in 1990 to a peak of 58.4 million (95% CI = 23.6 million – 121.9 million) cases in 2013. Dengue is also responsible for 1.14 million (95% CI = 0.73 million – 1.98 million) disability-adjusted-life-years in 2013 (Stanaway et al., 2016) out of which Asia alone bore 70% of this burden (Bhatt & et al, 2013).

The dengue situation in Malaysia is a healthcare threat as a result of a tremendous increase in the trend of incidence of the diseases' reported cases and death during the last two decades (Mia, Begum, Er, Abidin, & Pereira, 2013). From 1995 to 2015 there was an increase of dengue infection cases from 6543 to 120,836 respectively and from 28 dengue caused deaths in 1995 to 336 deaths in 2015 (Ministry of Health, 2016a). The annual economic burden in Malaysia is considerably high, over the decade of 2001 – 2010 it was estimated as high as about US$ 128m or about US$ 4.73 (95% CI = 3.34 – 6.71) per capita in 2010 only (Shepard et al., 2013).

UPM is in the state of Selangor, which is one of the states with the highest number of reports on dengue fever and number of hot spots in Malaysia. The state is home to most of the nation's hotspots for dengue fever with overcrowding and lack of cleanliness in high-risk areas as the major risk factors (Ministry of Health, 2016c). In 2013 and December 2016, Selangor reported 23,852 and 94,812 of dengue cases respectively (Ministry of Health, 2016d). When comparing 2016 report of dengue cases, it is 4 times higher the number of dengue cases in the whole nation reported in 2013 (Gill, 2017). Unpublished data retrieved from University health center (PKU) in UPM reported an average of 42 cases per year from 2013 to 2016. If dengue fever gets complicated there is a need of hospitalization in some cases. One study reported that the median duration of hospital stays among adults was 5 to 6 days ($P< 0.0001$) (Lee et al., 2016), and some can stay up to 9 days (Aroor, Saya, Sharma, Venkatesh, & Alva, 2015). Thus, the burden of the dengue infection can cause substantial amount of problems on the victims and as a result on the academic aspect of the individuals involved.

Additionally, in 2010 it was reported that there were high-density *Aedes albopictus* which is the second main vector for dengue transmission in UPM. The study exhibited high egg density and larvae density with the abundance of *Aedes albopictus* population outdoor (Maimusa, Jambari, Yahya, & Ahmad, 2012). The mosquito threshold for egg density and larva indices per ovi-traps differ according to different localities but the finding inside UPM was higher than the threshold in Taiwan and Thailand (CDC, 2016b). Moreover, according to the UPM official website, in 2011 UPM had a total of 31,000 students and around 40% of them used to live in the campus in 17 residential hostels. The population is at its maximum during day time when about another 6,000 lecturers and workers are around. These figures emphasize on how densely populated the university is during the academic year.

In the recent years, there has been a massive influx of international students in Malaysia, more than 93,000 students from 100 countries since 2011 (Higher Education Malaysia, 2015). As retrieved from the official website, in UPM, approximately 20% of the students are international students and the overall prevalence of dengue fever in Malaysia includes international individuals who are studying as well as working. A study as well identified that one of the contributing factors for the widespread of the dengue infection in Malaysia is attributed to the movement of newcomers with poor knowledge and attitude (Wong YM & Zainal Abidin, 2013).

Thus, it is important to study the prevalence and the factors associated with knowledge, attitude, and practices on prevention of dengue infection among UPM staffs and students as well as international students. There are several studies among local students however, studies among international students are limited. Moreover, the evolving pattern of dengue infection and the correlation with outsiders (foreigners) prompted to the interest of this present study.

1.3 Significance of Study

The finding from this study will be able to provide baseline knowledge, attitude, and practice on prevention of dengue infection among postgraduate international students of UPM for. The data obtained can also be used as a basis for further interventional studies based on these research findings. Based on the finding of this study regarding respondents' source of information about dengue infection, the most utilized mass media identified can be used to educate students about dengue infection prevention. Subsequently identifying the level of knowledge, attitude, and practices of dengue infection prevention could contribute to relevant authorities in the university as a guideline in reviewing strategic plan related to dengue infection practices of prevention. The outcome of the study could also help as a guide in making policy on internationals under academic sectors regarding dengue prevention.

1.4 Research Questions

1. What is the level of knowledge, attitude, and practice on prevention of dengue infection among UPM postgraduate international students?

2. What is the distribution of postgraduate international students based on sociodemographic information (age, gender, nationality, education, and marital status), source of information and its perceived influence, previous history of dengue (on respondents and close family), duration of stay in Malaysia, knowledge, attitude and practice on prevention of dengue infection?

3. What are the association of sociodemographic information (age, gender, nationality, education and marital status), the source of information and its influence, previous history of dengue (on respondents and close family), duration of stay in Malaysia and knowledge, attitude and practice on prevention of dengue infection?

4. What is the association of knowledge, attitude, and practice on prevention of dengue infection?

5. What are the predictors of good knowledge, positive attitude, and good practice on prevention of dengue infection among UPM postgraduate international students?

1.5 Objectives of the Study

1.5.1 General Objective

To determine the level of knowledge, attitude, and practice on prevention of dengue infection and predictors of good knowledge, attitude, and practice on prevention of dengue infection among UPM international students

1.5.2 Specific Objective

The specific objectives of this study are to:

1. Determine the distribution of
   - i. Knowledge, attitude, and practice on prevention of dengue infection.
   - ii. Socio-demographic information (age, gender, and marital status, the level of education, faculty/department, marital status and nationality).
   - iii. Duration of stay in Malaysia, previous history of dengue (on respondents and family or close friends) and source of information and its perceived influence towards knowledge and practice.

2. Determine the association of knowledge, attitude and practice on prevention of dengue infection and
   i. Sociodemographic info (age, gender, marital status, level of education, faculty, marital status and nationality),
   ii. Duration of stay in Malaysia, Previous history of dengue (on respondents and family or close friends) and source of information and its perceived influence towards knowledge and practice.

3. Determine the association of knowledge, attitude, and practice of prevention.

4. Determine the predictors of good knowledge, positive attitude, and good practices on prevention of dengue infection among UPM international students.

1.6 Research Hypotheses

1. There is a significant association between sociodemographic information (age, gender, marital status, the level of education, faculty/department, marital status and nationality) with knowledge, attitude, and practices on prevention of dengue infection among respondents.

2. There is a significant association between the duration of stay in Malaysia, previous history of dengue (on respondents and family or close friends) and source of information and its perceived influence towards knowledge with practice and knowledge, attitude, and practice on prevention among respondents.

3. There is significant association of knowledge, attitude, and practice on prevention of dengue infection among respondents.

REFERENCES

Abbasi, A., Abbas, K., Arooj, S., Habib, N., Aziz, W., & Ashaq, A. (2016). Dengue fever : A statistical analysis regarding awareness about dengue among university students in Azad Kashmir in Pakistan. *Journal of Healthcare Communications*, *2*(No. 1: 1), 1–8.

Abdullah, M. N., Azib, W. N. H. W., Harun, M. A., & Mohd, B. M. F. (2013). The Effect of gender and source of information towards knowledge , attitude and Practice on dengue fever prevention. *International Symposium on Mathematical Sciences and Computing Research*, *2013*(December), 6–7.

Abdullah, M. N., Azib, W. N. H. W., Harun, M. F. M., & Burhanuddin, M. A. (2013). Reliability and Construct Validity of Knowledge , Attitude and Practice on Dengue Fever Prevention Questionnaire. *American International Journal of Contemporary Research*, *3*(5), 69–75.

Adorama Candido Alves, A. L. dal F., Passos, A. D. C., Carneiro, A. F. T. M., Jorge, T. M., & Martinez, and E. Z. (2016). Knowledge and practices related to dengue and its vector : a community-based study from Southeast Brazil. *Revista Da Sociedade Brasileira de Medicina Tropical*, *49*(2), 222–226.

Ain, N. M., Azfar, M., Omarulharis, S., Maryam, Hafizah, A, A. B., & Akmal. (2017). Knowledge, attitude and practice of dengue prevention among sub urban community in Sepang, Selangor. *International Journal of Public Health and Clinical Sciences*, *4*(2), 73–83.

Al-dubai, S. A. R., Ganasegeran, K., Alwan, M. R., Alshagga, M. A., Saif-ali, R., Alam, S., & Lumpur, K. (2013). Factors Affecting Dengue Fever Knowledge , Attitudes and Practices Among Selected Urban , Semi-Urban and Rural Communities in. *Southeast Asian Journal Tropical Medicine Public Health*, *44*(1), 37–49.

Al-Zurf, M. N., Fuad, M. D., Abdelqader, M. A., Baobaid, M. F., Elnajeh, M., Ghazi, H. F., … Abdullah, M. R. (2015). Knowledge , attitude and practice of dengue fever and heath education programme among students of Alam Shah science school , Cheras , Malaysia. *Malaysian Journal Of Public Health Medicine*, *15*(September), 69–74.

Alhazmi, S., Khamis, N., Abalkhail, B., Muafaa, S., Alturkstani, A., Turkistani, A., & Almahmoudi, S. (2016). Knowledge, attitudes, and practices relating to dengue fever among high school students in Makkah, Saudi Arabia. *International Journal of Medical Science and Public Health*, *5*(5), 1.

Alobuia, W. M., Missikpode, C., & Aung, M. (2016). Knowledge, attitude and practices regarding vector-borne diseases in Western Jamaica. *Ann Glob Health. Authod Manuscript*, *81*(5), 654–663.

Alyousefi, T. A. A., Abdul-Ghani, R., Mahdy, M. A. K., Al-Eryani, S. M. A., Al-Mekhlafi, A. M., Raja, Y. A., … Beier, J. C. (2016). A household-based survey of knowledge, attitudes and practices towards dengue fever among local urban communities in Taiz Governorate, Yemen. *BMC Infectious Diseases*, *16*(1), 543.

Anker, M., & Arima, Y. (2011). Male-female differences in the number of reported incident dengue fever cases in six Asian countries. *Western Pacific Surveillance and Response*, *2*(2), e1–e1. https://doi.org/10.5365/wpsar.2011.2.1.002

Ankera, M., & Arimab, Y. (2011). WPRO _ Male-female differences in the number of reported incident dengue fever cases in six Asian countries. Retrieved from http://www.wpro.who.int/wpsar/volumes/02/2/2011_RA_Anker_Arima/en/

Arief, M., Hassali, M. A. A., Saleem, F., Muhammad Umair Khan, A. A., Bhagavathulha, A. S., & Jamshed, S. Q. (2017). A Cross-sectional Survey on the Knowledge and Attitudes towards Zika Virus and its Prevention among Residents of Selangor, Malaysia. *Journal of Pharmacy Practice and Community Medicine.*, *3*(2), 81–89.

Aroor, A. R., Saya, R. P., Sharma, A., Venkatesh, A., & Alva, R. (2015). Clinical manifestations and predictors of thrombocytopenia in hospitalized adults with dengue fever. *North American Journal of Medical Sciences*, *7*(12), 547–551.

Aung, M. M. T., Hassan, A. Bin, Kadarman, N. Bin, Mohammad, T., Bin, A., Ismail, S. B., … Hashim, B. (2016). Knowledge, Attitude, Practices Related to dengue fever among rural population in Terengganu, Malaysia. *Malaysian Journal of Public Health Medicine*, *16*(2), 15–23.

Aziz, A. T., Al-Shami, S. a, Mahyoub, J. a, Hatabbi, M., Ahmad, A. H., & Md Rawi, C. S. (2014). Promoting health education and public awareness about dengue and its mosquito vector in Saudi Arabia. *Parasites & Vectors*, *7*(November), 487.

Baaten, G. G. G., Sonder, G. J. B., Zaaijer, H. L., van Gool, T., Kint, J. A. P. C. M., & van den Hoek, A. (2011). Travel-related dengue virus infection, the Netherlands, 2006-2007. *Emerging Infectious Diseases*, *17*(5), 821–828.

Balmaseda, A., Hammond, S. N., Perez, M. A., Cuadra, R., Solano, S., Rocha, J., … Harris, E. (2005). Assessment Of The World Health Organization Scheme For Classification Of Dengue Severity In Nicaragua. *Am J Trop Med Hyg*.

Banneheke, H., Paranavitane, S., Jayasuriya, V., & Banneheka, S. (2016). Perceived risk of dengue in ones ' living environment as a determinant of behavior change through social mobilization and communication : Evidence from a high risk area in Sri Lanka. *Journal of Arthropod-Borne Disease*, *10*(3), 392–402.

Bharathi, N., Karthikayan, S., & Ramakritinan, C. M. (2015). KAP study on dengue epidemiology among paramedical students. *International Journal of Fauna and Biological Studies*, *2*(2), 62–64.

Bhatt, S., Gething, P. W., Brady, O. J., Messina, J. P., Farlow, A. W., Moyes, C. L., … Hay, S. I. (2013). The global distribution and burden of dengue. *Nature*, *496*(25,7446), 504–507.

Binsaeed, A. A., Sahli, A. A., Noureldin, E. M., Mohammed, W. S., Dafalla, O. M., Dahlan, A., … Alsheikh, A. A. (2015). Knowledge, attitudes and preventive practices of dengue fever among secondary school students in Jazan, Saudi Arabia. *Current World Environment*, *10*(3), 747–757.

Brady, O. J., Gething, P. W., Bhatt, S., Messina, J. P., Brownstein, J. S., Hoen, A. G., … Hay, S. I. (2012). Refining the global spatial limits of dengue virus transmission by evidence-based consensus. *PLoS Neglected Tropical Diseases*, *6*(8).

CDC. (2012). Dengue entamology/ecology.Mosquito Life-Cycle. Retrieved from http://www.cdc.gov/dengue/entomologyecology/m_lifecycle.html

CDC. (2014). Epidemiology of dengue. Retrieved from http://www.cdc.gov/dengue/epidemiology/

CDC. (2016a). Dengue: Laboratory guidance and diagnostic testing. Retrieved from http://www.cdc.gov/dengue/clinicallab/laboratory.html

CDC. (2016b). Surveillance and control of Aedes aegypti and Aedes albopictus in the United States. *CDC*. Retrieved from https://www.cdc.gov/chikungunya/pdfs/Surveillance-and-Control-of-Aedes-aegypti-and-Aedes-albopictus-US.pdf

Chakravarti, A., Roy, P., Malik, S., Siddiqui, O., & Thakur, P. (2016). A study on gender-related differences in laboratory characteristics of dengue fever . *Indian Journal Med Microbiology*, *34*(1), 82–84.

Chandren, J. R., Wong, L. P., & Abubakar, S. (2015). Practices of dengue fever prevention and the associated factors among the Orang Asli in Peninsular Malaysia. *PLoS Neglected Tropical Diseases*, 1–17.

Chanyasanha, C., Guruge, G. R., & Sujirarat, D. (2016). Factors influencing preventive behaviors for dengue infection among housewives in Colombo , Sri Lanka. *Asia-Pacific Journal of Public Health*, 1–9.

Chanyasanha, C., Han, M. M., & Teetipsatit, S. (2013). Dengue hemorrhagic fever knowledge , perception , and preventive behavior among secondary school students in Bangkok. *J Med Assoc Thai*, *96*(5), 14–24.

Ching, S., Ramachandran, V., Gew, L. T., Lim, S. M. S., Sulaiman, W. A. W., Foo, Y. L., … Diehr, P. (2016). Complementary alternative medicine use among patients with dengue fever in the hospital setting: a cross-sectional study in Malaysia. *BMC Complementary and Alternative Medicine*, *16*(1), 37.

Danial, M., Subramaniam, S., Kin, Y. C., & Meng, O. L. (2016). External factors governing dengue outbreaks and practices associated in curbing dengue infections among population in Northern Malaysia. *International Journal of Health Sciences and Research*, *6*(May), 224–233.

Dhimal, M., Aryal, K. K., Dhimal, M. L., Gautam, I., Singh, S. P., Lal, C., & Kuch, U. (2014). Knowledge , attitude and practice regarding dengue fever among the healthy population of highland and lowland communities in Central Nepal. *PLOS/one*, *9*(7), e102028.

Diana Rocio Higuera-Mendieta, Sebastian Cortes -Corrales, J. Q., & Gonzalez -Uribe, C. (2016). KAP surveys and dengue control in Colombia : Disentangling the effect of sociodemographic factors using multiple correspondence analysis. *PLoS Neglected Tropical Diseases*, (september), 1–18.

Doblecki-Lewis, S., Chang, A., Jiddou-Yaldoo, R., Tomashek, K. M., Stanek, D., Anil, L., & Lichtenberger, P. (2016). Knowledge, attitudes, and practices of Florida physicians regarding dengue before and after an educational intervention. *BMC Medical Education*, *16*(1), 124.

Fabrigar, L. R., Petty, R. E., Smith, S. M., & Crites, S. L. (2006). Understanding knowledge effects on attitude – behavior consistency : The role of relevance , complexity , and amount of knowledge. *Journal of Personaity and Zsocial Psycology*, *90*(4), 556–577.

Fry, S. R., Meyer, M., Semple, M. G., Simmons, C. P., Sekaran, S. D., Huang, J. X., … Matthew, A. (2011). The Diagnostic sensitivity of dengue rapid test assays is significantly enhanced by using a combined antigen and antibody testing approach. *PLoS Neglected Tropical Diseases*, *5*(6), 1–8.

Gill, B. S. (2017). History and Epidemiology of Dengue. Myhealth ministry of health Malaysia. Retrieved from http://denggi.myhealth.gov.my/history-and-epidemiology-of-dengue/?lang=en

Government of India. (2008). Guidelines for clinical management of dengue fever, dengue haemorrhagic fever and dengue shock syndrome. https://doi.org/10.1017/CBO9781107415324.004

Gyawali, N., Bradbury, R. S., & Taylor-Robinson, A. W. (2016). Knowledge, attitude and recommendations for practice regarding dengue among the resident population of Queensland, Australia. *Asian Pacific Journal of Tropical Biomedicine*, *6*(4), 360–366.

Hadinegoro, S. R., Arredondo-García, J. L., Capeding, M. R., Deseda, C., Chotpitayasunondh, T., Dietze, R., … Saville, M. (2015). Efficacy and long-term safety of a dengue vaccine in regions of endemic disease. *New England Journal of Medicine*, *373*(13), 1195–1206.

Handel, A. S., Ayala, E. B., Borbor-Cordova, M. J., Fessler, A. G., Finkelstein, J. L., Espinoza, R. X. R., … Stewart-Ibarra, A. M. (2016). Knowledge, attitudes, and practices regarding dengue infection among public sector healthcare providers in Machala, Ecuador. *Tropical Diseases, Travel Medicine and Vaccines*, *2*(1), 8.

Higher Education Malaysia. (2015). The Malaysian Higher Education System .An Overview . International Students. Retrieved from https://www.studymalaysia.com/international/the-national-education-system/the-malaysian-higher-education-system-an-overview

Hosmer, D. W., & Lemeshow, S. (2000). *Applied Logistic Regression*. (N. A.C & N. I. Fisher, Eds.) (Second Edi). New York,USA: JOHN WILEY &SONS,INC. Retrieved from http://resource.heartonline.cn/20150528/1_3kOQSTg.pdf

Ibrahim, N. K. R., Al-Bar, A., Kordey, M., & Al-Fakeeh, A. (2009). Knowledge, attitudes, and practices relating to dengue fever among females in Jeddah high schools. *Journal of Infection and Public Health*, *2*(1), 30–40.

Itrat, A., Khan, A., Javaid, S., Kamal, M., Khan, H., Javed, S., … Jehan, I. (2008). Knowledge, awareness and practices regarding dengue fever among the adult population of dengue hit cosmopolitan. *PLoS ONE*, *3*(7), 1–6.

Jain, S., Mishra, M. K., Gupta, S. K., Agrawal, S. S., & Shukla, U. S. (2014). Knowledge, attitude and preventive practices about dengue fever among nursing student of tertiary care hospital. *Journal of Evolution of Medical and Dental Sciences*, *3*(6), 1481–1488.

Jay, A. I., Faisal, I., & Rampal, L. (2017). Knowledge, Attitude and Practice towards dengue prevention among medical students in Faculty of Medicine and Health Sciences, Universiti Putra Malaysia. Medical Journal of Malaysia.

Jeelani, S., Sabesan, S., & Subramanian, S. (2015). Community knowledge , awareness and preventive practices regarding dengue fever in Puducherry - South India. *Public Health*, 1–7.

Kalayanarooj, S., Vaughn, D. W., Nimmannitya, S., Green, S., Suntayakorn, S., Kunentrasai, N., … Ennis, F. a. (1997). Early clinical and laboratory indicators of acute dengue illness. *The Journal of Infectious Diseases*, *176*(2), 313–321.

Kasture, P. N., Nagabhushan, K., & Kumar, A. (2016). A multi-centric, double-blind, placebo-controlled, randomized, prospective study to evaluate the efficacy and safety of carica papaya leaf extract, as empirical therapy for thrombocytopenia associated with dengue fever. *Journal of The Association of Physicians of India*, *64*, 15–20.

Koenraadt, C. J. M., Tuiten, W., Sithiprasasna, R., Kijchalao, U., Jones, J. W., & Scott, T. W. (2006). Dengue knowledge and practices and their impact on Aedes aegypti populations in Kamphaeng Phet, Thailand. *American Journal of Tropical Medicine and Hygiene*, *74*(4), 692–700.

Kumar, J. R., Kishore, A., Kumar, S. D., Shamshul, A., Govind, D., & Sangharshila, B. (2016). Knowledge and awareness regarding dengue among the undergraduate health science students of dengue hit region of Nepal. *International Research Journal of Medical Sciences*, *4*(1), 8–12.

Kyu, H. H., Thu, M., & Putten, M. Van der. (2005). Myanmar migrant woman caretakers on prevention of dengue fever: A study on knowledge, attitude and practices in Tak Province, Thailand. *AU Journal of Technology*, *9*(2), 99–105.

Lee, T. H., Wong, J. G. X., Leo, Y. S., Thein, T. L., Ng, E. L., Lee, L. K., & Lye, D. C. (2016). Potential harm of prophylactic platelet transfusion in adult dengue patients. *PLoS Neglected Tropical Diseases*, *10*(3), 1–10.

Leong, T. K. (2014). Knowledge , attitude and practice on dengue among rural communities in Rembau and Bukit Pelanduk, Negeri Sembilan, Malaysia. *International Journal of Tropical Disease & Health*, *4*(7), 841–848.

Lwanga, S. K., & Lemeshow, S. (1991). *Sample size dermination in health studies- A practical manual*. *WHO*. Retrieved from apps.who.int/iris/bitstream/10665/40062/1/9241544058_(p1-p22).pdf

Maimusa, A. H., Jambari, Yahya, & Ahmad. (2012). Aedes mosquitoes surveillance in non-residential areas in university campus in Malaysia. *Asian J Exp Biol Sci*, *3*(1), 163–169.

Mane, A. S. (2016). Knowledge, attitude and practice of general public and nursing staff of hospitals regarding the dengue fever. *Annals of International Medical and Dental Research*, *2*(5), 21–24.

Mayxay, M., Cui, W., Thammavong, S., Khensakhou, K., Vongxay, V., Inthasoum, L., … Armstrong, G. (2013). Dengue in peri-urban Pak-Ngum district , Vientiane capital of Laos : A community survey on knowledge , attitudes and practices. *BMC Public Health*, *13*(434), 2–8.

Mia, M. S., Begum, R. A., Er, A. C., Abidin, R. D. Z. R. Z., & Pereira, J. J. (2013). Trends of dengue infections in Malaysia, 2000-2010. *Asian Pacific Journal of Tropical Medicine*, *6*(6), 462–466.

Ministry of Health. (2016a). Dengue incidence rate & case fatalitiy rate for year 2000-2016. Retrieved from idengue.remotesensing.gov.my/idengue/content/statistik.pdf

Ministry of Health. (2016b). Dengue incidence rate and case fatality rate for year 200-2016. Retrieved from idengue.remotesensing.gov.my/idengue/content/statistik.pdf

Ministry of Health. (2016c). idengue. Locality list of "Hot Spot" until 1 October 2016 (week 39) (Epidemic area lasting more than 30 days). Retrieved from http://idengue.remotesensing.gov.my/idengue/index.php

Ministry of Health. (2016d). Laman Utama Report of Dengue cases in Malayisa biweekly. Retrieved from http://www.amanahraya.com.my/bm/index.asp

Ministry of Higher Education Malaysia. (2014). *National education statistic: Higher education sector 2013*. Retrieved from https://www.mohe.gov.my/muat-turun/awam/statistik/...perangkaan-pendidikan.../file

Muhammad Moaaz Arif, M. A. A., & Arif, A. (2015). Knowledge , Attitude and Practice (KAP) of dengue fever in adult semi-urban and rural population of central Punjab Pakistan. *APMC Original Article*, *9*(3), 129–135.

Naing, C., Yih, W., Chan, R., Man, Y., Wong, C., & Ee, S. (2011). Awareness of dengue and practice of dengue control among the semi-urban community : A cross sectional survey. *J Community Health*, *36*, 1044–1049.

Nayyar, U., Dar, U. F., Latif, M. Z., Haider, R., Mahmud, T., & Nizami, R. (2013). Knowledge, awareness and practices about dengue fever among university students. *Pakistan Journal of Medical and Health Sciences*, *7*(4), 1097–1100.

Nazeer, & Silva, T. D. d. (2015). Awareness of dengue fever among the urban youth in Colombo and its Suburbs, Sri Lanka in November 2014. *International Journal of Nursing and Health Care*, *3*(1), 25–29.

Nimmannitya S. (1987). Clinical spectrum and management of dengue haemorrhagic fever. *Southeast Asian Jou Trop Med Public Health*, *18*(3), 392–7.

Nur Syakilah Mahyiddin, R. M., & Hamid Jan Jan Mohamed, N. R. (2017). High knowledge on dengue preventive ptactices among residents in a low cost flat in Ampang, Selangor. *The Malaysian Journal of Nursing*, *8*(1), 39–48.

Ooi, E. T., Ganesananthan, S., Anil, R., Kwok, F. Y., & Sinniah, M. (2008). Gastrointestinal manifestations of dengue infection in adults. *Med J Malaysia*, *63*(5), 401–405.

Pang, E. L., & Loh, H. S. (2016). Current perspectives on dengue episode in Malaysia. *Asian Pacific Journal of Tropical Medicine*. Elsevier B.V.

Payghan, B. S., Kadam, S. S., Chandram, M. S., & Ramya, V. (2014). Knowledge, attitude and practices regarding dengue infection among pre-university college students. *International Journal of Medical Science and Clinical Inventions*, *1*(7), 371–378.

Paz-soldán, V. A., Morrison, A. C., Lopez, J. J. C., Lenhart, A., Scott, T. W., Elder, J. P., … Mccall, P. J. (2015). Dengue knowledge and preventive practices in Iquitos , Peru. *The American Society of Tropical Medicine and Hygiene*, *93*(6), 1330–1337.

Precioso, Palacios, Thomé, Mondini, & Kalil, B. J. (2016). Phase III trial to evaluate efficacy and safety of a tetravalent dengue vaccine- clinical evaluation strategies

for a live attenuated tetravalent dengue vaccine. Retrieved from https://clinicaltrials.gov/ct2/show/NCT02406729

Qadir, S., Ahmad, I., Akhtar, M. N., & Naeem, H. (2015). Knowledge , attitude and practice about dengue fever among local population. *Gomal Journal of Medical Sciences*, *13*(2), 87–90.

Qi, X., Wang, Y., Li, Y., Meng, Y., Chen, Q., & Ma, J. (2015). The effects of socioeconomic and environmental factors on the incidence of dengue fever in the Pearl River Delta, China, 2013. *PLoS Neglected Tropical Diseases*, *9*(10), 1–13.

Rahim, A., Hamizah, LJ., O., Anita, & Rafee, M. (2016). Risk assessment on dengue among UPM students. *International Journal of Public Health and Clinical Sciences*, *3*(3), 132–140.

Rahman, H. A. (2015). Knowledge , attitude and practice (KAP) of dengue fever prevention among community in Kampung Bayam , Kubang Kerian , Kelantan, Malaysia. *Journal of Advances in Environmental Biology*, (1).

Rahman, H. A., & Zamri, E. N. (2015). Knowledge , Attitude and Practice (KAP) of dengue fever prevention among Kelantan, Malaysia. *Journals Advances in Environmental Biology*, *9*(9), 10–16.

Rakhmani, A. N., Okanurak, K., Kaewkungwal, J., & Limpanont, Y. (2017). Knowledge , perception , and dengue prevention behavior in lowokwaru sub district , urban area in Malang, Indonesia. *Journal of Advances in Health and Medical Sciences*, *3*(1), 17–26.

Ramzan, M., Ansar, A., & Nadeem, S. (2015). Dengue epidemics : Knowledge perhaps is the only key to success. *J Ayub Med Coll Abbottabad*, *27*(2), 402–406.

Rao, G., Minhat, H., & Hayati, K. (2016). Predictors of practices related to dengue fever prevention among international students in Universiti Putra Malaysia, Serdang. *International Journal of Public Health and Clinical Sciences*, *3*(5), 36–47.

Ratnam, I., Leder, K., Black, J., & Torresi, J. (2013). Dengue fever and international travel. *Journal of Travel Medicine*, *20*(6), 384–393.

Rehman, A. ur, Mahmood, M. A., Kazmi, S. F., Munir, F., & Ghan, U. (2015). Dengue fever ; Impact of knowledge on preventive practice. *Ann. Pak. Inst. Med. Sc*, *11*(4), 195–201.

Saied, K. G., Al-taiar, A., Altaire, A., & Alqadsi, A. (2015). Knowledge , attitude and preventive practices regarding dengue fever in rural areas of Yemen. *International Health Advance Access Published*, (april), 1–6.

Sarti, E., Cox, H., Besada-Lombana, S., & Tapia-Maruri, L. (2015). Dengue awareness in Latin American populations: A questionnaire study. *Infectious Diseases and Therapy*, *4*(2), 199–211.

Sayavong, C., Chompikul, J., Wongsawass, S., & Rattanapan, C. (2015). Knowledge, attitudes and preventive behaviors related to dengue vector breeding control measures among adults in communities of Vientiane, capital of the Lao PDR. *Journal of Infection and Public Health*, *8*(5), 466–473.

Schwartz, E., Weld, L. H., Wilder-Smith, A., Von Sonnenburg, F., Keystone, J. S., Kain, K. C., … Freedman, D. O. (2008). Seasonality, annual trends, and characteristics of dengue among ill returned travelers, 1997-2006. *Emerging Infectious Diseases*, *14*(7), 1081–1088.

Seng, T. A. (2001). Legislation for dengue control in Malaysia. *Dengue Bulletin*, *25*(October), 109–112.

Shepard, D. S., Undurraga, E. A., & Halasa, Y. A. (2013). Economic and disease burden of dengue in Southeast Asia. *PL0S Neglected Tropical Diseases*, *7*(2), e2055,1-12.

Shuaib, F., Todd, D., Campbell-Stennett, D., Ehiri, J., & Jolly, P. E. (2010). Knowledge, attitudes and practices regarding dengue infection in Westmoreland, Jamaica. *The West Indian Medical Journal*, *59*(2), 139–146.

Siddiqui, F. R., Usmani, A. Q., Atif, I., Usman, S. H. Bin, & Haider, S. H. (2013). Are we aware of dengue fever ? A community based KAP survey on dengue fever in Rawalpindi. *Original Article*, 69–73.

Skae, T. (1902). Dengue fever in Penang. *The British Medical Journal*, (Nov, 15), 1581–1582.

Stanaway, J. D., Shepard, D. S., Undurraga, E. A., Halasa, Y. A., Coff, L. E., Brady, O. J., … Foundation, M. G. (2016). The global burden of dengue : An analysis from the global burden of disease study 2013. *Lancet Infectious Diseas*, *3099*(16), 1–12.

Takahashi, R., Wilunda, C., Magutah, K., & Thein, T. (2014). Knowledge , attitude , and practices related to dengue among caretakers of elementary school children in Chanthaburi Province , Thailand. *International Journal of TROPICAL DISEASE & Health*, *4*, 123–135.

Taksande, A., & Lakhkar, B. (2013). Knowledge , Attitude and Practice (KAP) of dengue fever in the rural area of central India. *Shiraz E- Medical Journal*, *13*(4), 146–157.

Thai, K. T. D., Nishiura, H., Hoang, P. L., Thanh, N., Tran, T., Phan, G. T., … Vries, P. J. De. (2011). Age-specificity of clinical dengue during primary and secondary infections. *PLoS Neglected Tropical Diseases*, *5*(6), e1180.

Tikoo, D., Sharma, G., & Gupta, M. (2016). Assessment of knowledge, attitude and practice of dengue in factory workers of Amritsar, Punjab. *International Journal of Basic & Clinical Pharmacology*, *5*(1), 38–44.

Uematsu, M., & Mazier, C. Z. (2016). Knowledge , attitudes , and practices regarding dengue among the general population in Honduras. *American Journal of Public Health Research*, *4*(5), 181–187.

Vaishnavi, B., Churi, S., G, N. M., Kurian, J., B, L., Laldinpuii, E., & Baby, F. S. (2015). Study of impact of health eduacation on knowledge, attitude and practice related to dengue fever. *World Journal of Pharmacy and Pharmaceutical Sciences*, *4*(10), 748–761.

Villar, L., Dayan, G. H., Arredondo-García, J. L., Rivera, D. M., Cunha, R., Deseda, C., … Noriega, F. (2014). Efficacy of a tetravalent dengue vaccine in children in Latin America. *New England Journal of Medicine*, *372*(2), 1195–1206.

Wallis, H., & Lugova, S. (2016). Cross-sectional survey on the dengue knowledge , attitudes and preventive practices among students and staff of a public university in Malaysia. *Journal of Community Health*, (1), 15–21.

WHO. (2009). Dengue: Guidelines for diagnosis, treatment, prevention, and control, x, 147. Retrieved from http://whqlibdoc.who.int/publications/2009/9789241547871_eng.pdf

WHO. (2012a). Global strategy for dengue prevention and control 2012–2020. *World Health Organiszation*, 43. https://doi.org//entity/denguecontrol/9789241504034/en/index.html

WHO. (2012b). *Handbook for clinical management of dengue*. Retrieved from www.wpro.who.int/mvp/.../handbook_for_clinical_management_of_dengue.pdf

WHO. (2016a). Dengue Situation Update Number 500. Update on the Dengue situation in the Western Pacific Region .Northern Hemisphere, *32*(470), 1–5.

WHO. (2016b). WHO: Weekly epidemiological record, *21*(91), 265–284. https://doi.org/10.1186/1750-9378-2-15.Voir

WHO. (2016c). WHO. Dengue and severe dengue. *Who*. Retrieved from http://www.who.int/mediacentre/factsheets/fs117/en/

WHO. (2017). Dengue and severe dengue, Fact sheet. Retrieved from http://www.who.int/mediacentre/factsheets/fs117/en/

WHO. (2017). Dengue control strategies -Vector control. Retrieved from www.who.int/denguecontrol/control_strategies/en/

WHO. (2017). Dengue situation update number 522 :Update on the dengue situation in the Western Pacific Region Northern Hemisphere, (522), 1–5. Retrieved from www.wpro.who.int/emerging_diseases/dengue_biweekly_20170801.pdf?ua=1

Wilder-Smith, A. (2013). Dengue infections in travellers. *Paediatrics and International Child Health*, *32*(1), 28–32.

Wisman, M., Hamid, A., Lugova, H., Mon, A. A., & Knight, V. F. (2015). Awareness and practice related to dengue infection among military cadets in Malaysia. *Journal of Behavioral Health*, *4*(2), 39–43.

Wong, L. P., Shakir, S. M. M., Atefi, N., & AbuBakar, S. (2015). Factors affecting dengue prevention practices: Nationwide survey of the Malaysian public. *PLoS ONE*, *10*(4), 1–16.

Wong YM, & Zainal Abidin, A. (2013). Dengue virus infection among foreigners in Kuala Lumpur and Putrajaya, 2010- 2012. *Malaysian Journal of Public Health Medicine ,7th National Public Health Conference 2013 : 11-13th November*, *13*(2), 32.

Yboa, B. C., & Labrague, L. J. (2013). Dengue knowledge and preventive practices among rural residents in Samar Province , Philippines. *American Journal of Public Health Research*, *1*(2), 47–52.