# Practice of Dengue Prevention Among School-Aged Children in Indonesia

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## Abstract

*Purpose:* This study aims to determine the practice of dengue prevention among school-aged children in Indonesia

*Methodology:* This study is quantitative research with a cross-sectional approach and conducted in May 2020. The total of 230 subjects school-aged children recruited in the study by using a convenience sampling. Data collection using the Self-Efficacy Questionnaire (Practice For Dengue Fever) with Cronbach's alpha > 70.

*Results:* Most of the respondents cleaned the area around the house (92.2%), wear long sleeves and long pants to prevent mosquito bites (82.2%). A small percentage (31%) use mosquito nets while sleeping, put abates or chemicals to kill mosquitoes in water storage (32.4%), and spray dark places with insect vendors and half of them (59.4%). use mosquito nets while sleeping

*Application:* The need for support and assistance from healthcare professionals in primary school to practice dengue prevention.

**Keywords:** Dengue fever, practice, prevention, school-aged, children

## Introduction

Dengue fever (DF) is common in tropical and subtropical regions, especially during the rainy season when optimal conditions for mosquitoes breed, making epidemics of extraordinary events with a short time (Center for Disease Control and Prevention, 2010). Dengue fever and dengue hemorrhagic fever can affect most Asian and Latin American countries and have become a major cause of hospitalisation and death in children and adults (World Health Organization, 2014). Dengue fever is transmitted by female mosquitoes, especially Aedes aegypti and Aedes albopictus species, which can transmit other diseases such as chikungunya, yellow fever, and zika virus (World Health Organization, 2018).

The incidence of dengue and dengue hemorrhagic fever in 2010 to 2018 has increased and decreased, especially in 2016 is the largest outbreak in the entire world. With an average estimated number of ± 3.5 million cases. Latin America reaches 2.38 million cases with 1032 death is ranked as the biggest outbreak. In Indonesia ranks second in dengue fever outbreaks (World Health Organization, 2018).

Based on (Ministry of Health of the Republic of Indonesia, 2017) dengue fever and dengue fever in Indonesia with data in 2016 as many as 204,171 cases with the death of 1,598 people. Most groups who experienced this disease at the age of 5-14 years with a case fatality rate (CFR) reached 43.44% and aged 15-44 years reached 33.25%. It should be noted that the incidence of dengue hemorrhagic fever is reported if the first number of cases shows a doubling or more increase compared to the previous year's average. Based on previous research from (Prayitno et al., 2017) that eight children out of 10 in Indonesia are infected with dengue virus with ages 1-4 years 33.8%, children aged 5-9 years 64.4%, ages 10-14 years 83.1%, and age 15-18 years 89.0%.

The risk of dengue hemorrhagic fever has increased quite seriously, because it can cause death with a fairly high mortality rate, especially in conditions of extraordinary events. According to data from the West Java Health Office the number of dengue fever in 2016 in West Java province amounted to 37,418 cases with the death of 277 people with a case fatality rate (CFR) of 0.74%. The incidence of dengue fever in the district area with nine regencies/cities in West Java shows a relatively large difference, the incidence of dengue fever in the city shows higher, caused by transportation system factors and high population mobility (Dinas Kesehatan jabar, 2016 ).

School-age children are the nation's next-generation that must be equipped with knowledge so that they can form healthy and productive behaviour. Therefore, schools are one of the targets of dengue fever prevention

programs due to the activities of school-age children while sitting in class and doing activities in the school environment together with mosquito activity in the morning at 8:00 to 12:00 and in the afternoon at 15:00 to 17:00. Children aged 7-15 years have the risk of being exposed to dengue fever indoors indoors at school from morning to noon, so it is possible to be bitten by a dengue vector mosquito (Pujiyanti & Pratamawati, 2014, 2016).

Dengue hemorrhagic fever is an infectious disease that is a public health problem. The behaviour of prevention and control efforts has been carried out by the government, especially health care. Health Dines already has a program for preventing and controlling dengue hemorrhagic fever such as eradication of mosquito nests including the 3M program (draining, burying, closing), Fogging, Jumantik (Department of Health, Java, 2016). Besides, the dengue fever prevention program is a dengue eradication program from Australia that is active in Indonesia and has only been implemented in Yogyakarta through the World Mosquito Program using a safe natural bacterium called Wolbachia to reduce the ability of mosquitoes to transmit viruses among humans. With the existence of this program in Indonesia, it can eradicate or reduce the incidence of dengue in Indonesia.

## Methods

### *Study Design*

This study used a descriptive quantitative research design that aims to describe or describe variables (Nursalam, 2008). Researchers use the Cross-Sectional method utilising convenience sampling for data collection at the same time (Point Time Approach) (Notoatmodjo, 2010). The total of 230 students recruited in this study with convenience sampling.

### *Instrument*

The instrument for this study used the demographic characteristics instrument and the Self Efficacy (Practice For Dengue Fever) instrument developed in Malaysia (Chandren et al., 2015). The demographic characteristics of the instrument consisted of gender, age, class in the child and gender, age, education, work of parents. While the Instrument Self Efficacy (Practice Fore Dengue Fever) to measure the behavior of mosquito breeding prevention and behavior of mosquito bite prevention.

This instrument was arranged based on 15 items which were divided into two conceptual items, which were eight items to prevent mosquito breeding, and 7 to prevent mosquito bites. The measurement scale of this instrument uses a Likert scale (not at all = 0, rarely = 1, sometimes = 2, often = 3, and cannot be applied = 0) and each is calculated based on the number of valid answers. The scoring calculation is based on the number of points obtained (more) the total points of the applicable answer by using scoring (50-100). The results are reported as a percentage, where a higher percentage indicates higher dengue prevention practices. How to fill this instrument by checking . Researchers in this instrument process translators from English to Indonesian and from Indonesian to English.

### *Data Analysis*

Analysis of the data used for this study is to use univariate data analysis, which aims to explain or describe the characteristics of each research variable. The univariate analysis uses frequency distribution analysis. Univariate analysis was performed for one variable that allegedly had a picture (Notoatmodjo, 2010). This study conducted data analysis using IBM SPSS Statistics 25.

## Results

Table 1. Demographic Characteristics (n=230)

| Variables | Frequency (n) | Presentase (%) |
|---|---|---|
| **Gender** | | |
| Male | 106 | 46.1 |
| Female | 124 | 53.9 |

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| Age (years) | | |
|---|---|---|
| 9 | 11 | 4.8 |
| 10 | 88 | 38.2 |
| 11 | 101 | 43.9 |
| 12 | 30 | 13.1 |
| **Grade** | | |
| IV | 117 | 50.9 |
| V | 113 | 49.1 |
| Total | 230 | 100 |

Based on Table 1, it can be explained that most of the frequency distribution of female respondents is 124 school children (53.9%). The age characteristic explained that the majority of the age of respondents was 11 years old, namely 101 school children (43.9%). Most of the respondents from the many classes are 117 school children (50.9%).

Table 2. Practice of dengue prevention

| Practice of dengue prevention | Frequency ($\Sigma$) | Precentage (%) | Mean | SD |
|---|---|---|---|---|
| **Prevention of mosquito breeding** | | | | |
| Cover all water for storing in or outside the house | 446 | 70.0% | 1.94 | 1.026 |
| Change stored water in flower vases, drip tray or pails | 391 | 61.3% | 1.70 | 1.086 |
| Put abate or chemical in water storage containers | 207 | 32.4% | .90 | 1.055 |
| Examine for mosquito larvae in containers for storing water | 430 | 67.5% | 1.87 | 1.037 |
| Clear out debris that may block water flow in drain or roof gutters | 428 | 67.1% | 1.86 | 1.014 |
| Proper disposal of items that can collect rainwater | 441 | 69.2% | 1.92 | 1.105 |
| Proper disposal of household garbage | 637 | 100% | 2.77 | .587 |
| Clean up surrounding house area | 581 | 92.2% | 2.53 | .780 |
| **Prevention of mosquito bite** | | | | |
| Sleep in mosquito net of have mosquito screens on windows | 198 | 31.0% | .86 | 1.089 |
| Use mosquito coil, electrical mosquito mat, liquid vapourizer | 487 | 76.4% | 2.12 | 1.002 |
| Spraying dark places with an insecticidal spray | 315 | 59.4% | 1.37 | 1.061 |
| Use mosquito repellent on body | 430 | 67.5% | 1.87 | 1.062 |
| Avoid dark areas in the home where there is no light and no wind | 373 | 58.5% | 1.62 | 1.090 |
| Wear long-sleeved shirts and pants to avoid mosquito bites | 524 | 82.2% | 2.28 | .804 |
| Wear bright colour clothes to avoid mosquito bites | 360 | 56.5% | 1.57 | 1.046 |

Based on Table 2, the results of 230 respondents obtained the behavior of dengue prevention with various percentage of total scores 25-44. It shows that from the total score per item statement all respondents (N = 637, 100%) practice throwing garbage in its place. Most respondents also practised cleaning the area around the house (N = 581, 92.2%). It also noted that 82.2% (N = 524) of respondents attempted to wear long sleeves and

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long pants to prevent mosquito bites. Only a small percentage of the lowest percentage scores in the range of 10-24 respondents (N = 198, 31.0%) use mosquito nets while sleeping, put abates or chemicals to kill mosquitoes in water storage (N = 207, 32.4%), and the last is spraying the place those with dark insecticide carriers use mosquito nets while sleeping (N = 315, 59.4%).

## Conclusion

The results of research on dengue prevention behavior by measuring questionnaire (Chandren et al., 2015). Based on table 2, this study shows the behavior of dengue prevention with various percentages of total scores 25-44. It shows that from the total score per-item statement of all respondents (N = 637, 100%) practice throwing garbage in its place. Most respondents also practised cleaning the area around the house (N = 581, 92.2%). It also noted that 82.2% (N = 524) of respondents attempted to wear long sleeves and long pants to prevent mosquito bites. Only a small percentage of the lowest percentage scores in the range of 10-24 respondents (N = 198, 31.0%) use mosquito nets while sleeping, put abates or chemicals to kill mosquitoes in water storage (N = 207, 32.4%), and the last is spraying the place those with dark insecticide carriers use mosquito nets while sleeping (N = 315, 59.4%).

According to (Notoatmodjo, 2003), behavior is an activity of oneself occurring a reaction or response to stimuli and stimuli from outside both observed directly or not directly observed. Human behavior contributes to the majority in controlling mosquito breeding sites and reducing the mosquito population. Hence based on table 2 it is known that most of the dengue prevention behaviors in school children are higher in environmental management where there is a highest score in the range of 25-44 garbage disposal behavior in its place (N = 637, 100%). The more active behavior in prevention or action the more influential in preventing dengue (Rohim, 2017).

According to Ministry of Health Republic of Indonesia (2017), vector control is one of the effective methods in controlling and preventing dengue fever. Vector control can be done by frequent fogging, in many endemic areas in the room. However, Aedes ageypti tends to hide indoors, making it difficult for insecticides for adult mosquitoes. One method to prevent dengue fever is to eradicate the breeding places of dengue mosquitoes outside and indoors. This study is in line with (Chandren et al., 2015) stating that in Thailand, the success of preventing dengue by eradicating mosquito breeding sites has reduced the number of dengue cases in Thailand. The success of efforts to prevent and control dengue fever mainly from the community itself and sanitation of the home or school environment, water supply, and changes in human behavior towards dengue fever.

According to (Hijroh, Bahar, & Ismail, 2017) abate is an insect killer such as a mosquito larva in water storage areas. Abate has the function to kill the larvae of Aedes aegypti mosquitoes. Abate dose of 10 grams is used in water storage with a capacity of 100 liters of water. Abate is usually used in water storage areas that are rarely cleaned. Based on table 4.3 Prevention of dengue fever by adding abate powder to water storage areas (N = 207, 32.45%) is poorly understood by school children. Almost some respondents did not understand school children understand the use of abate, a place to put it and how many abates are provided by the services of health workers.

According to (Pujiyanti & Pratamawati, 2016) social learning theory states that cognitive factors play an important role in the success of a behavior. The cognitive factor in question is a belief in one's ability to deal with and solve effective problems. Elementary school students already have good behavior about measures to eradicate mosquito breeding. Easy and simple steps to eradicate mosquito nests carried out with the support of elementary school students referred to as larva monitoring officers independently carried out at home and at school.

According to (Pujiyanti & Pratamawati, 2014) efforts to protect against mosquito bites play an important role in minimising the risk factors for dengue transmission in the school environment. The lack of preventive measures for dengue can not be separated from knowledge, behavior and low public perception of the danger of Aedes aegypyi mosquito bites. It is hoped that the improvement of preventative behavior towards the school community can change their perception of the seriousness and vulnerability of dengue fever transmission and can form positive behaviors in controlling dengue fever at school.

One form of behavior that is often applied in the prevention of dengue fever is the eradication of mosquito nests by carrying out the 3M plus movement (closing, draining, washing).

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## References

Anggraeni, D. S. (2010). Stop! Demam Berdarah Dengue. Bogor: Cita Insan Madani.

Azwar Ma, S. (2016). Sikap Manusia Teori Dan Pengukurannya. Yogyakarta: Pustaka Pelajar.

Bahar, H., & Ismail, C. S. (2017). Perilaku Masyarakat dalam Pencegahan Penyakit Demam Berdarah Dengue (Dbd) Puskesmas Puuwatu Kota Kendari Tahun 2017. *(Jurnal Ilmiah Mahasiswa Kesehatan Masyarakat)*, 2(6).

Cahyo, A. N., Syarifah, A. S., & Wibowo, H. (2015). Gambaran Pelaksanaan Psn (Pemberantasan Sarang Nyamuk) Dengan 3m Dalam Pencegahan Penyakit Dbd (Demam Berdarah Dengue) Oleh Keluarga: The Description of Implementation MNE (Mosquito Nest Eradication) with 3 M in Disease Prevention Dengue (Dengue Hemorraghic Fever) by Family in Jeruk Kuwik Bareng Jombang. *Jurnal Ilmiah Keperawatan (Scientific Journal of Nursing)*, 1(1), 6-12.

Center For Disease Control And Prevention. (2010). Epidemiology Dengue Fever. Retrieved from www.cdc.gov

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 Negl Trop Dis*, 9(8), e0003954. Dinas Kesehatan Jabar. (2016).

Profil Kesehatan Provinsi Jawa Barat. Bandung. Retrieved from http://diskes.jabarprov.go.id

Ernawati, B. CN, & Martina, SE (2018). Gambaran praktik pencegahan demam berdarah dengue (DBD) di wilayah endemik DBD. *Jurnal Keperawatan*, 9(1), 17-24.

Ginanjar, G. (2008). Demam Berdarah. Jakarta: Pt. Mizan Publika.

Gunarsa D, S. (2008). Psikologi Anak : Psikologi Perkembangan Anak dan Remaja. Jakarta: PT BPK Gunung Mulia.

Hasibuan M.S. (2005). Manajemen Sumber Daya Manusia. Jakarta: Edisi Revisi Bumi Aksara.

Hastuti, O. (2008). Demam Berdarah Dengue. Yogyakarta: Kanisius.

Hayani, A., Erlan, A., & Yunus, W. (2006). Pengaruh Pelatihan Guru Uks Terhadap Efektivitas Pemberantasan Sarang Nyamuk Demam Berdarah Dengue Di Tingkat Sekolah Dasar, Kota Palu, Provinsi Sulawesi Tengah. Sulawesi Tengah: Jurnal Ekologi Kesehatan.

Himah, E. F., & Huda S. (2018). Gambaran Upaya Pencegahan Penyakit (DBD) Demam Berdarah Dengue Pada Keluarga Di Desa Jati Kulon Kabupaten Kudus Tahun 2017. *Jurnal Keperawatan Dan Kesehatan Masyarakat*, 7 (1), 79–88.

Kemenkes Kesehatan Ri. (2017). Profil Kesehatan Indonesia. Jakarta: Kementrian Kesehatan Ri 2017. Retrieved from http://www.kemkes.go.id

Kemenkes Ri. (2017). Pedoman Pencegahan Dan Pengendalian Demam Berdarah Dengeu Di Indonesia. Jakarta: Kementrian Kesehatan Ri 2017.

Kepmenkes No. 1457. (2003). Tentang Standar Pelayanan Minimal (Spm) Bidang Kesehatan Di Kabupaten/ Kota. Jakarta: Kemenkes Ri.

Koentjaraningrat. (1997). Metode-Metode Penelitian Masyarakat. Jakarta: Pt. Gramedia Pustaka Utama.

Koes, I. (2014a). Epidemiologi Penyakit Menular & Tidak Menular Panduan Klinis. Bandug: Alfabeta, Cv.

Koes, I. (2014b). Ilmu Kesehatan Masyarakat. Bandung: Alfabeta, Cv.

Marcdante, K. J., Kligman, R. M., Jenson, H. B., & Behrman, R. E. (2018). Nelson Ilmu Kesehatan Anak Esensial Edisi Ke-6. Singapore: Elsevier Singapore Pte Ltd.

Notoatmodjo, S. (2003). Pendidikan Dan Perilaku Kesehatan. Jakarta: Rineka Cipta.

Notoatmodjo, S. (2007). Promosi Kesehatan & Ilmu Perilaku. Jakarta: Pt Rienka Cipta.

Notoatmodjo, S. (2010). Metodologi Penelitian Kesehatan. Jakarta: Pt Rienka Cipta.

Nursalam. (2008). Konsep Dan Penerapan Metodologi Penelitian Ilmu Keperawatan, Edisi 2 Pedoman Skripsi, Tesis, Dan Isntrumen Penelitian Keperawatan. Jakarta: Salemba Medika.

Peter, J. P., & Jerry, C. O. (2001). Consumer Behavior : Perilaku Konsumen Dan Strategi Pemasaran, Edisi Keempat. Jakarta: Erlangga.

Prayitno, A., Taurel, A. F., Nealon, J., Satari, H. I., Karyanti, M. R., Sekartini, R., ... & Simmerman, J. M. (2018). Correction: Dengue seroprevalence and force of primary infection in a representative population of urban dwelling Indonesian children. *PLoS neglected tropical diseases*, *12*(5), e0006467.

Pujiyanti, A., & Pratamawati, D. A. (2014). Pengendalian vektor demam berdarah dengue pada komunitas sekolah dasar di Kecamatan Tembalang, Kota Semarang. *Vektora*, *6*(2), 46-51.

Pujiyanti, A. (2016). Hubungan Pengetahuan, Sikap, Dan Perilaku Dalam Rangka Pengendalian Vektor DBD Pada Siswa Sekolah Dasar Di Kecamatan Tembalang, Kota Semarang. *Media Penelitian dan Pengembangan Kesehatan*, *26*(2), 85-92.

Rahayu S.Si, L. (2010). Waspada Wabah Penyakit Panduan Untuk Orang Awam. Ujung Berung-Bandung: Nuansa.

Rohim, A. (2015). Gambaran Kejadian Demam Berdarah Dengue Berdasarkan Faktor Lingkungan dan Host di Wilayah Kerja Puskesmas Pamulang Tahun 2015 (Bachelor›s thesis, UIN Syarif Hidayatullah Jakarta: Fakultas Kedokteran dan Ilmu Kesehatan, 2017).

Sitio, A. (2008). Hubungan Perilaku Tentang Pemberantasan Sarang Nyamuk Dan Kebiasaan Keluarga Dengan Kejadian Demam Berdarah Dengue Di Kecamatan Medan Perjuangan Kota Medan Tahun 2008. Pasca Sarjana Universitas Dipenorogo. Semarang.

Soedarmo, P. S. S. (1937). Demam Berdarah (Dengue) Pada Anak. Jakarta: Universitas Indonesia.

Soedarto. (2012). Demam Berdarah Dengue (Dengue Haemorrhagic Fever). Surabaya: Cv Sagungseto.

Sugiyono. (2013). Metodelogi Penelitian Kuantitatif, Kualitatif Dan R & D. Bandung: Alfabeta.

Sujariyakul, A., Prateepko, S. W., Chongsuvivatwong, V., & Thammapalo, S. (2005). Transmission of Dengue Haemorrhagic Fever: At Home or School.

Sumanto M.A. (2014). Psikologi Perkembangan Fungsi Dan Teori. Yogyakarta: Caps (Center Of Academic Publishing Service).

Sumantri, A. (2013). Kesehatan Lingkungan : Edisi Revisi. Jakarta: Kencana.

Sunaryo. (2002). Psikologis Untuk Keperawatan. Jakarta: Egc.

Terri Kyle & Susan Carman. (2012). Buku Ajar Keperawatan Pediatri Vol. 1 Edisi 2. Buku Kedokteran Egc.

Therawiwat, M., Fungladda, W., Kaewkungwal, J., Imamee, N., & Steckler, A. (2005). Community-based approach for prevention and control of dengue hemorrhagic fever in Kanchanaburi Province, Thailand.

Widoyono. (2008). Penyakit Tropis, Epideiologi, Penularan Dan Pemberantasan. Jakarta: Erlangga.

Wong, D. ., Hockenberry, M., Wilson, D., Winkelstien, M. ., & Schwarzt, P. (2008). Buku Ajar Keperawatan Pediatric. Jakarta: Egc.

World Health Organization. (2011). Comprehensive Guidelines For Prevention And Control Of Dengue And Dengue Haemorrhagic Fever. India: Office Of South-East Asia.

World Health Organization. (2014). Dengue And Severe Dengue. Retrieved From Http://www.who.int/Mendiacentre/Factsheet/Fs17/En

World Health Organization. (2018). Dengue And Severe Dengue. Retrieved From Http://www.who.int/ Mediacentre/Factsheets/Fs117/En/

World Mosquito Mosquito. (2014). Eliminate Dengue Project Yogyakarta. Retrieved From Www. Eliminatedengue.Com/Yogyakarta