Factors related to the presence of mosquito eggs trapped in ovitrapsDHF-endemic areas in Kendari City, Indonesia

by Reni Yunus

Public Health of Indonesia
E-ISSN: 2477-1570 I P-ISSN: 2528-1542

Original Research

Factors related to the presence of mosquito eggs trapped in ovitraps DHF-endemic areas in Kendari City, Indonesia

Askrening[1], Adi Supryatno[2], Reni Yunus[1], Supiati[1]

[1]Poltekkes Kemenkes Kendari, Indonesia
[2]Department of Health Administration, Universitas Banten Jaya, Serang, Banten, Indonesia

Doi: https://dx.doi.org/10.36685/phi.v7i4.445
Received: 25 July 2021 I Revised: 12 August 2021 I Accepted: 18 November 2021

Corresponding author:
Adi Suprayitno, SKM., MSi
Department of Health Administration, Universitas Banten Jaya
Warung pojok doni, Jl. Ciwaru Raya No.73, Cipare, Kec. Serang, Kota Serang, Banten, Indonesia 42117
Email: adisupryatno@unbaja.ac.id

Abstract

Background: Dengue hemorrhagic fever (DHF), one type of infectious disease caused by the dengue virus, is still becoming a public health problem in Indonesia. The high number of dengue cases in Indonesia, especially in Kendari City itself, is closely related to environmental conditions, especially when it is known that the city has entered the rainy season.

Objective: This study aimed to identify and analyze the factors associated with the presence of mosquito eggs trapped in ovitraps DHF-endemic area in Kendari City, Indonesia.

Methods: This study used an analytic observational approach with a cross-sectional design. The research sample in this study was 50 houses located in endemic areas of Kendari selected using simple random sampling. Data were collected by observation using a checklist sheet and direct observation in each room of the respondent's house based on lighting, temperature, humidity, and physical environmental conditions, as well as the presence of mosquito eggs or larvae trapped in the ovitrap. The analysis was carried out in two stages, namely univariate analysis and bivariate analysis using the Chi-Square test.

Result: From 50 houses observed, 13 houses (26%) had the presence of mosquito eggs, 42 houses (84%) had bad air temperature, 19 houses (38%) had poor humidity, and 35 houses (70%) had a higher frequency. In addition, the temperature, lighting, and environmental conditions did not have a significant relationship with the presence of mosquito eggs in ovitraps in endemic areas of Kendari City, with p-values of 0.94, 0.52, and 0.39, respectively. In contrast, the humidity factor has a significant relationship with the presence of eggs with a p-value of 0.000.

Conclusion: There was a significant relationship between humidity and the presence of mosquito eggs in ovitraps in endemic areas of Kendari City, Indonesia. It is recommended that residents increase Mosquito Nest Eradication (PSN) activities, perform selective abatization, and disseminate information about DHF through counseling or other activities conveyed through health workers with full support from community leaders and adjusted to the level of education of the local population.

Keywords: temperature; humidity; lighting; physical environment; presence of mosquito eggs; Indonesia

Background

Dengue hemorrhagic fever (DHF) has become a public health problem in Indonesia (Tosepu, 2017). Dengue virus infection can be transmitted through mosquito bites (Yunus & Rosanty, 2016; Alhamda, 2017), and the types of mosquitoes that can be a source of transmission of dengue hemorrhagic fever are mosquitoes of the Aedes aegypti and Aedes albopictus species (Wertheim et al., 2012; Tosepu, Tantrakarnapa, Worakhunpiset, et al., 2018). Dengue hemorrhagic fever is a seasonal disease that always appears every year. As if endless, DHF is a disease that infects many people in tropical and subtropical areas. Asia, especially Indonesia, ranks first in the number of dengue fever sufferers every year (Tosepu, Tantrakarnapa, Nakhapakorn, et al., 2018). Especially for Indonesia, high rainfall allows dengue cases to increase when the rainy season arrives (Tosepu, Tantrakarnapa, Nakhapakorn, et al., 2018). However, mosquito larvae are still able to breed in puddles so that they can still grow every year. This is coupled with environmental conditions and sanitation in many areas in Indonesia which are far from healthy (Widoyono, 2008; Siswanto et al., 2019).

Based on data from the Ministry of Health of the Republic of Indonesia in 2020, the total cases of DHF in Indonesia reached 95,893 cases, and 661 people died from the disease. The total cases of DHF were spread across 472 districts/cities in 34 provinces, with deaths from dengue hemorrhagic fever reported from 219 districts/cities. In November 2020, there were 51 additional cases of dengue fever and one additional death report due to dengue hemorrhagic fever. In addition, 73.35 percent or 377 districts/cities have reached an Incident Rate of less than 49 per 100 thousand inhabitants (Ministry of Health Republic of Indonesia, 2020).

The number of dengue cases reported at the Kendari City Health Office, Southeast Sulawesi, Indonesia, until mid-June 2020 reached 764, with eight of them dead. Distribution of patients who died from dengue fever in Kendari City, Bau-Bau City, and Konawe Regency. The cases were spread in 15 regencies and cities, and the most cases were in Kendari City, around 291 cases, and the lowest cases were in the Buton district. There are several endemic areas for the spread of the dengue virus, such as Poasia sub-district, Wua wua sub-district, and Puuwatu, where these areas from year to year have always been the largest contributor to DHF patients in Kendari City, Indonesia (Dinas Kesehatan Kota Kendari, 2020).

Preliminary studies carried out by research still found several mosquito larvae in several residents' homes, and the survey results found the larvae-free rate (ABJ) was at least 60%. The presence of larvae in an area is known by the indicator of the larva-free rate. ABJ is the percentage of houses or public places where larvae are not found. Low ABJ is influenced by several factors. The behavior of the population in terms of storing water for daily needs is not only in one place, and rarely cleaning water reservoirs allows the Aedes aegypti mosquito to have more opportunities to lay eggs (Sitorus & Ambarita, 2019). According to Hasyimi and Soekirno (2019), the most common Aedes aegypti larvae or pupae found in household landfills are household landfills made of metal. The type of household landfill that most commonly found larvae or pupae of Aedes aegypti was the jar type landfill. There are three types of TPA found positive for Aedes aegypti larvae inside or outside the house, namely drums, bathtubs, and plastic buckets (Sitorus & Ambarita, 2019).

The high number of dengue cases in Indonesia, especially in Kendari City, is closely related to environmental conditions, especially since Kendari City has entered the rainy season. There are still many people who do not understand the environmental conditions that can trigger the spread of dengue fever. Environmental conditions are conditions that can affect the development of Aedes aegypti mosquito larvae. DHF vector breeding and resting places such as containers filled with water, humidity, lighting, and air temperature can be a big threat to the spread of DHF disease (Anwar & Rahmat, 2015). Therefore, this study aimed to analyze the factors associated with the presence of mosquito eggs trapped in the ovitrap DHF-endemic area in Kendari City, Indonesia.

Methods

Study Design, Setting, and Subjects

This study uses an analytical observational approach with a cross-sectional design. This research was conducted in July 2019 involving 58 households in the endemic area selected using simple random sampling.

Instrument

Data were collected by observing using a checklist sheet and direct observation in each room of the respondent's house based on lighting, temperature, humidity, and physical environmental conditions, as well as the presence of mosquito eggs or larvae trapped in the ovitrap. The observation sheet was adopted from previous research (Panjaitan, 2014)

Data Analysis

Data were analyzed using univariate analysis to describe the distribution of respondents and each variable. Furthermore, bivariate analysis was carried out to test the hypothesis of the relationship between the independent variable and the dependent variable, using computer software with SPSS version 25 with Chi-square test (significance level p-value 0.05 or 95% confidence level).

Ethical Consideration

This study was approved by the Ethical Clearance Committee of Poltekkes Kemenkes Kendari, Indonesia (Ref number: UT.01.01/6/6021/ 2019). Consent was obtained from the administrative bodies of the health facility and the participants.

Results

Table 1 shows that there were more houses with bad air temperature, namely 42 houses (84%), compared to houses with good air temperature, namely eight houses (16%). The house with good humidity had a higher distribution of 31 houses (62%) than the house with bad humidity at 19 houses (38%). Houses with dim lighting had a higher frequency of 35 houses (70%) than 15 houses with bright lighting (30%). In addition, the condition of the physical environment of houses that met the requirements was higher, 38 houses (76%), compared to houses that did not meet the requirements, 12 houses (24%). The results of the presence of eggs in the ovitrap installed in the house were found to have mosquito eggs in 13 houses (26%), while 37 houses did not find any mosquito eggs (74%).

Table 1 Distribution of temperature, humidity, lighting, physical environmental conditions, and the presence of Mosquito eggs trapped in Ovitrap DHF-endemic area

Variable	f	%
Temperature		
Good	8	16
Bad	42	84
Humidity		
Good	31	62
Bad	19	38
Lightning		
Bright	15	30
Not Bright	35	70
Physical Environment		
Eligible	38	76
Not Eligible	12	24
Mosquito Eggs		
Presence	13	26
Absence	37	74

Temperature and Mosquito Eggs Presence

Table 2 shows that the houses with a temperature at risk for the development of mosquito eggs were more in the houses with a bad temperature of 11 houses (75%) than the houses with a good temperature of 2 houses (25%). The Chi-Square test results obtained a p-value of 0.944, which indicates that there was no significant relationship between temperature and the presence of mosquito eggs.

Humidity and Mosquito Eggs Presence

Table 3 shows that houses that have the humidity at risk for the development of mosquito eggs were more in houses with bad humidity as many as 13 houses (68.42%), while houses that had good humidity had no development of mosquito eggs. The Chi-Square results obtained a p-value of 0.000, indicating a significant relationship between humidity and the presence of mosquito eggs.

Table 2 Temperature related to the presence of mosquito eggs

Temperature	Mosquito Eggs		p-value
	Presence	Absence	
Good	2 (25%)	6 (75%)	0.944
Bad	11 (75%)	31 (73.82%)	

Table 3 Humidity related to the presence of mosquito eggs

Humidity	Mosquito Eggs		p-value
	Presence	Absence	
Good	0 (0%)	31 (100%)	0.000
Bad	13 (68.42%)	6 (31.58%)	

Lightning and Mosquito Eggs Presence

Table 4 shows that the houses that have lighting at risk for the development of mosquito eggs were more in houses with low lighting as many as ten houses (28.57%), while houses with bright lighting were found in 3 houses that have the presence of mosquito eggs (20%). Also, there was no significant relationship between lighting and the presence of mosquito eggs, with a p-value of 0.527.

Table 4 Lightning related to the presence of mosquito eggs

Lightning	Mosquito Eggs		p-value
	Presence	Absence	
Bright	3 (20%)	12 (80%)	0.527
Not Bright	10 (28.57%)	25 (71.43%)	

Physical and Mosquito Eggs Presence

Based on Table 5, it is found that the houses that have physical environmental conditions at risk for the development of mosquito eggs were more in houses with a physical environment that met the requirements as many as 11 houses (28.95%) while houses with a physical environment that did not meet the requirements were only found two houses, which had the presence of mosquito eggs (16.67%). In addition, there was no significant relationship between physical environmental conditions and the presence of mosquito eggs.

Table 5 Physical environment related to the presence of mosquito eggs

Physical Environment	Mosquito Eggs		p-value
	Presence	Absence	
Eligible	11 (28.95%)	27 (71.05%)	0.398
Not Eligible	2 (16.67%)	10 (83.33%)	

Discussion

The results of observations of poor house air temperatures were more at risk of developing mosquito eggs than good house temperatures, but based on the results of the Chi-Square test, there was no significant relationship between house air temperature and the presence of mosquito eggs in ovitraps in endemic areas of Kendari City (p-value 0.944). This phenomenon shows that good or bad house temperature conditions did not rule out the possibility of the development of mosquito eggs and may be exposed to dengue disease. The results of this study were in line with Yudhastuti and Vidiyani (2005) research on the relationship between environmental conditions, containers, and community behavior with the presence of Aedes aegypti mosquito larvae in dengue hemorrhagic fever endemic areas, Surabaya, Indonesia, that there was no significant relationship between air temperature and the presence of Aedes aegypti mosquito larvae in the Wonokusumo Village (p-value 0.591). Another study by Rahmayanti et al. (2016) regarding the relationship between physical environmental factors of the house and the incidence of dengue fever in Semarang City, Indonesia, also showed that there was no relationship between temperature and the incidence of dengue fever with a p-value of 0.608.

The results of house lighting observations found that the distance of the respondent's house, which was quite close, affected the intensity of light that could enter the house, and there were still many trees around the house, so that the lighting was less than optimal. This provides an opportunity for mosquitoes because a place with minimal light will be used as a place to rest. However, based on the results of the Chi-Square test, it was found that there was no relationship between lighting and the presence of eggs (p-value 0.527). The results of this study were not in line with the research of Werdinigsih et al. (2017) on the relationship between physical environmental conditions and the presence of mosquito larvae that there was a relationship between lighting conditions and the presence of mosquito larvae with a p-value of 0.008. The absence of a significant relationship between lighting and the presence of eggs in this study is because most residents often open doors or windows in the morning and afternoon so that there is still sunlight coming in.

In addition, the findings of this study showed that there was no significant relationship between the physical environment of the house and the presence of mosquito eggs in the ovitrap in the endemic area of Kendari City (p-value 0.398). This study was in line with research conducted by Nugroho (2009) on factors related to the presence of Aedes aegypti larvae that there was no relationship between waste and the presence of Aedes aegypti larvae (p-value 0.504). The results of observations in this study of physical environmental conditions such as water reservoirs (bathtubs & pots), solid waste disposal sites have mostly met the requirements, and only a few were found around the respondent's house, such as solid waste in the form of used bottles and used cans. In addition, the existence of types of water reservoirs both inside and outside the respondent's house has a high risk as a breeding ground for the Aedes aegypti mosquito, but only two houses out of a total of 50 houses do not meet the requirements for physical environmental conditions and most houses, or the majority of houses meet the conditions of the physical environment.

The results of the observation of the humidity factor found that under humidity, the risk for the development of mosquito eggs was more in homes that had bad humidity as many as 13 houses (68.42%) while houses with good humidity did not find the development of mosquito eggs. In addition, there is a significant relationship between humidity and the presence of eggs in mosquitoes in ovitraps in endemic areas of Kendari city (p-value 0.000). The results of this study are in line with Yudhastuti and Vidiyani (2005) research on the relationship between environmental conditions, containers, and community behavior with the presence of Aedes aegypti mosquito larvae in dengue hemorrhagic fever endemic areas, Surabaya, that there is a significant relationship between air humidity and the presence of Aedes aegypti mosquito larvae in Wonokusumo Village (p-value 0.000).

Humidity ranges from 60%-80% is the optimal humidity to help the embryonication process and mosquito larvae resistance. At a humidity of less than 60%, the lifespan of a mosquito will be short because it will affect the mosquito's respiratory system so that if it is in low humidity, it will cause evaporation of the mosquito's body (Wijirahayu & Sukesi, 2019).

Conclusion

The factors of temperature, lighting, and environmental conditions were not related to the presence of eggs in ovitraps DHF-endemic area in Kendari City, Indonesia, but humidity factors related to the presence of eggs in ovitraps. However, further research is needed, especially with a larger population and sample coverage. It is also recommended for residents to increase Mosquito Nest Eradication (PSN) activities, perform selective abatization or keep larvae-eating fish in places that are difficult to clean to eradicate larvae and do fogging to kill mosquito populations and dissemination of information about DHF through counseling or other activities should be conveyed through health workers with full support from community leaders and adjusted to the level of education of the local population. In addition, the threat of dengue will increase when people begin to enter a new life order or new normal. Buildings or office buildings that have been inactive for a long time during the quarantine period (pandemic Covid-19) for the past few months have the potential to become soft places for Aedes aegypti mosquitoes to breed. For this reason, it is recommended that the Mosquito Nest Eradication (PSN) be carried out as well as possible in order to avoid the transmission of dengue fever when the community is busy entering the new normal period.

Declaration of Conflicting Interest

The authors declare no conflict of interest.

Funding

None.

Acknowledgment

The authors would like to extend their sincere thanks to Universitas Banten Jaya and Poltekkes Kemenkes Kendari, Indonesia, as well as special thanks to all data collectors, supervisors, and study participants.

Author Contributions

All authors contributed equally in all stages of the study and agreed with the final version of the article to be published and accountable in all phases of the work.

Author Biographies

Askrening, SKM., M.Kes is a Director of Poltekkes Kemenkes Kendari, Indonesia.

Adi Supryatno, SKM., M.Si is a Lecturer at Universitas Banten Jaya, Indonesia.

*Reni Yunus, S.Si., M.*Sc is a Lecturer at Poltekkes Kemenkes Kendari, Indonesia.

Supiati, STP., MPH is a Lecturer at Poltekkes Kemenkes Kendari, Indonesia.

References

Alhamda, S. (2017). Relationships of the implementation of a 3M Plus program and the existence of Aedes Aegypti larvae towards the number of dengue fever cases in the Public Health Center of Tigo Baleh Bukittinggi, West Sumatera, Indonesia. *Public Health of Indonesia,, 3*(3), 131-137. https://doi.org/10.36685/phi.v3i3.127

Anwar, A., & Rahmat, A. (2015). Hubungan kondisi lingkungan fisik dan tindakan PSN masyarakat dengan container index jentik Ae. aegypti di wilayah Buffer Bandara Temindung Samarinda. *HIGIENE: Jurnal Kesehatan Lingkungan, 1*(2), 116-123.

Dinas Kesehatan Kota Kendari. (2020). *Profil Kesehatan Kota Kendari*. Indonesia: Dinas Kesehatan Kota Kendari

Hasyimi, H., & Soekirno, M. (2019). Pengamatan tempat perindukan Aedes aegypti pada tempat penampungan air rumah tangga pada masyarakat pengguna air olahan. *Jurnal Ekologi Kesehatan, 3*(1), 37-42.

Ministry of Health Republic of Indonesia. (2020). *Health Profile of Republic Indonesia*. Jakarta: Ministry of Health Republic of Indonesia.

Nugroho, F. S. (2009). *Faktor-faktor yang berhubungan dengan keberadaan jentik Aedes aegypti di RW IV Desa Ketitang Kecamatan Nogosari Kabupaten Boyolali*. Indonesia: Universitas Muhammadiyah Surakarta.

Panjaitan, H. (2014). *Pengaruh lingkungan fisik dan perilaku masyarakat terhadap kejadian demam berdarah dengue di wilayah kerja Puskesmas Helvetia Kota Medan tahun 2013*. Medan: Universitas Sumatera Utara.

Rahmayanti, N., Wahyuningsih, N. E., & Dina, R. A. (2016). Hubungan faktor lingkungan fisik rumah, keberadaan breeding places, perilaku penggunaan insektisida dengan kejadian DBD Di Kota Semarang. *Jurnal Kesehatan Masyarakat (Undip), 4*(5), 44-51.

Siswanto, S., Risva, R., & Nana, M. (2019). Epidemiology forecasting analysis of dengue haemorraghic fever with seasonal autoregressive integrated moving average in tropical area. *Public Health of Indonesia,5*(2), 38-47. https://doi.org/10.36685/phi.v5i2.261

Sitorus, H., & Ambarita, L. P. (2019). Pengamatan Larva Aedes di Desa Sukaraya Kabupaten Oku dan di Dusun Martapura Kabupaten Oku Timur Tahun 2004.

Tosepu, R. (2017). Trends of dengue hemorrhagic fever in bau bau district, Southeast Sulawesi province, indonesia, 2009-2014. *Public Health of Indonesia, 3*(4), 147-151. https://doi.org/10.36685/phi.v3i4.142

Tosepu, R., Tantrakarnapa, K., Nakhapakorn, K., & Worakhunpiset, S. (2018). Climate variability and dengue hemorrhagic fever in Southeast Sulawesi Province, Indonesia. *Environmental Science and Pollution Research, 25*(15), 14944-14952. https://doi.org/10.1007/s11356-018-1528-y

Tosepu, R., Tantrakarnapa, K., Worakhunpiset, S., & Nakhapakorn, K. (2018). Climatic factors influencing dengue hemorrhagic fever in Kolaka district, Indonesia. *Environment and Natural Resources Journal, 16*(2), 1-10. http://10.14456/ennrj.2018.10

Werdinigsih, I., Damayanti, S., & Rowa, S. N. (2017). Hubungan Pengetahuan dan kondisi lingkungan fisik rumah dengan keberadaan jentik nyamuk Aedes sp di Dusun Krapyak Kecamatan Sewon Kabupaten Bantul Yogyakarta. *Jurnal Kesehatan Masyarakat, 10*(2). https://doi.org/10.47317/jkm.v10i2.92

Wertheim, H. F., Horby, P., & Woodall, J. P. (2012). *Atlas of human infectious diseases*. New Jersey: John Wiley & Sons.

Widoyono. (2008). *Penyakit tropis epidemiologi, penularan, pencegahan, dan pemberantasannya*. Jakarta: Erlangga.

Wijirahayu, S., & Sukesi, T. W. (2019). Hubungan kondisi lingkungan fisik dengan kejadian demam berdarah dengue di Wilayah Kerja Puskesmas Kalasan Kabupaten Sleman. *Jurnal Kesehatan Lingkungan Indonesia, 18*(1), 19-24. https://doi.org/10.14710/jkli.18.1.19-24

Yudhastuti, R., & Vidiyani, A. (2005). Hubungan kondisi lingkungan, kontainer, dan perilaku masyarakat dengan keberadaan jentik nyamuk Aedes aegypti di daerah endemis demam berdarah dengue Surabaya. *Jurnal Kesehatan Lingkungan, 1*(2).

Yunus, R., & Rosanty, A. (2016). Relationship between knowledge, action of family in DCB (Drain, Close, And Bury) program, and the existence of eggs of aedes aegypti mosquito on ovitrap in Kandai Kendari, Indonesia. *Public Health of Indonesia, 2*(4), 185-190. https://doi.org/10.36685/phi.v2i4.97

Cite this article as: Askrening., Supryatno, A., Yunus, R., & Supiati. Factors related to the presence of mosquito eggs trapped in ovitraps DHF-endemic areas in Kendari City, Indonesia. *Public Health of Indonesia, 7*(4), 159-165. https://dx.doi.org/10.36685/phi.v7i4.445

Factors related to the presence of mosquito eggs trapped in ovitrapsDHF-endemic areas in Kendari City, Indonesia

ORIGINALITY REPORT

27%	22%	17%	6%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	lp2m.stikesayani.ac.id Internet Source	5%
2	journal.ugm.ac.id Internet Source	4%
3	journal.unnes.ac.id Internet Source	2%
4	journal.uin-alauddin.ac.id Internet Source	2%
5	cajmns.centralasianstudies.org Internet Source	1%
6	Submitted to Universitas Sembilanbelas November Kolaka Student Paper	1%
7	Agung Sutriyawan, Herdianti Herdianti, Pandu Adi Cakranegara, Yosef Pandai Lolan, Yakobus Sinaga. "Predictive Index Using Receiver Operating Characteristic and Trend Analysis of Dengue Hemorrhagic Fever Incidence",	1%

Open Access Macedonian Journal of Medical Sciences, 2022
Publication

8	Submitted to Universitas Airlangga Student Paper	1%
9	Juminten Saimin, Yenti Purnamasari, Sufiah Asri Mulyawati, Nur Indah Purnamasari, Arimaswati Arimaswati, Ferry Sandra. "Vaginal Acidity Affects Vaginal Microbiota in Postmenopausal Women", The Indonesian Biomedical Journal, 2022 Publication	1%
10	Prayudhy Yushananta. "Dengue Hemorrhagic Fever and Its Correlation with The Weather Factor In Bandar Lampung City: Study From 2009-2018", Jurnal Aisyah : Jurnal Ilmu Kesehatan, 2021 Publication	1%
11	download.garuda.ristekdikti.go.id Internet Source	1%
12	"Abstracts of the Asian Congress of Nutrition 2019", Annals of Nutrition and Metabolism, 2019 Publication	1%
13	S Alhamda, E Barlian. " Strategy 3M plus to reduce incidence disease dengue haemorrhagic fever in Public Health Centre	<1%

(PHC) West Sumatra-Indonesia ", IOP Conference Series: Earth and Environmental Science, 2019
Publication

14	Hetty Ismainar, Beny Yulianto, Nila Puspita Sari, Eva Afiani. "ANALYSIS OF THE PHYSICAL HOME ENVIRONMENT AND COMMUNITY BEHAVIOR TOWARDS INCIDENCE OF DENGUE HEMORRHAGIC FEVER IN RIAU PROVINCE", Jurnal Mitra Kesehatan, 2021 Publication	<1%
15	Submitted to Udayana University Student Paper	<1%
16	www.oeci.eu Internet Source	<1%
17	Suwarsi Suwarsi, Nurwijayanti Nurwijayanti. "Analysis of Behaviour, Social Support and Motivation of Jumantik Cadre to Dengue High Fever (DHF) Entomological Index in the Pesantren 1 Public Health Center Kediri City", Journal for Quality in Public Health, 2021 Publication	<1%
18	proceeding.poltekeskupang.ac.id Internet Source	<1%
19	Submitted to Curtin University of Technology Student Paper	<1%

jurnal.poltekeskupang.ac.id

20	Internet Source	<1%
21	Julliana Purdianingrum, Muhammad Adib Mubarok, Rahmah Putri Sunarno, Ummi Khairunisa et al. "Is stress level related to Dengue Hemorrhagic fever cases in Semarang?", Journal of Physics: Conference Series, 2018 Publication	<1%
22	amrsjournals.com Internet Source	<1%
23	iopscience.iop.org Internet Source	<1%
24	www.scribd.com Internet Source	<1%
25	eprints.ums.ac.id Internet Source	<1%
26	www.dovepress.com Internet Source	<1%
27	Ahmad Wasis Setyadi, Astri Yunita, Nanang Muhibuddin. "The Relationship of Environmental Sanitation and Family Attitudes with Events of Dengue Hemorrhagic Fever (DHF) in Working Areas UPTD Public Health Centre Bendo Kediri District", Journal for Quality in Public Health, 2021	<1%

Publication

28	Anggie Praditya Aprisa, Martini Martini, Dian Saraswati Lintang. " Correlation of Container Characteristic, Water-Container Draining Practice, and the Ownership Status of Residence with the Presence of Larvae in Tembalang, Semarang ", E3S Web of Conferences, 2018 Publication	<1%
29	Disaster Prevention and Management, Volume 23, Issue 4 (2014-09-16) Publication	<1%
30	ejhs.ju.edu.et Internet Source	<1%
31	ejournal2.undip.ac.id Internet Source	<1%

Exclude quotes Off
Exclude bibliography On
Exclude matches Off

Factors related to the presence of mosquito eggs trapped in ovitrapsDHF-endemic areas in Kendari City, Indonesia

GRADEMARK REPORT

FINAL GRADE

/0

GENERAL COMMENTS

Instructor

PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5

PAGE 6

PAGE 7