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THE CORRELATION BETWEEN KNOWLEDGE, ATTITUDES, BEHAVIORS, AND INCIDENTS REGARDING DENGUE FEVER AMONG FARMERS IN THE KALITIDU SUBDISTRICT, BOJONEGORO

HUBUNGAN ANTARA PENGETAHUAN, PERILAKU, DAN SIKAP DENGAN INSIDEN DEMAM BERDARAH PADA PETANI DI KECAMATAN KALITIDU, BOJONEGORO

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Penelitian

A B S T R A C T

Background: *Dengue Fever (DF) is a type of fever that comes on suddenly and lasts for 2 - 7 days. It is caused by the dengue virus and is spread by the Aedes aegypti mosquito.* ***Purpose:*** *The purpose of this research is to investigate the relationship between the level of knowledge, attitudes, and behaviors about DF and the incidence of dengue.* ***Method:*** *This research utilized a non-experimental, cross-sectional design with a correlational research approach. The data were collected using a probability sampling technique called simple random sampling. This research surveyed 67 family heads, who worked as farmers, to become respondents and their data were analyzed using the Chi-square test.* ***Result:*** *The statistical analysis using the Chi-square test resulted in p-values of 0.000055 for knowledge, 0.00001 for attitudes, and 0.003316 for behavior. All of which were significant at a level of p-value < 0.05. The findings revealed that the majority of respondents 83% had a high level of knowledge about dengue, 77% had a high level of attitudes, and 66% exhibited a high level of behaviors. Out of the 67 respondents, a large percentage 85% had not contracted dengue fever.* ***Conclusion:*** *There is a significant correlation between the level of knowledge, behaviors, and attitudes regarding Dengue Hemorrhagic Fever (DHF) and the incidence of dengue fever.*

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A B S T R A K

Latar belakang: Demam Berdarah Dengue (DBD) merupakan salah satu jenis demam yang datang secara tiba-tiba dan berlangsung selama 2 - 7 hari. Penyakit ini disebabkan oleh virus dengue dan disebarkan oleh nyamuk *Aedes aegypti*. **Tujuan:** Penelitian ini bertujuan untuk mengetahui hubungan antara tingkat pengetahuan, sikap, dan perilaku tentang DBD dengan kejadian DBD. **Metode:** Penelitian ini menggunakan desain *cross-sectional non*-eksperimental dengan pendekatan penelitian korelasi. Pengumpulan data dilakukan dengan teknik *probability* sampling yang disebut *simple* random sampling. Penelitian ini menyurvei 67 kepala keluarga yang berprofesi sebagai petani untuk menjadi responden dan datanya dianalisis menggunakan uji *Chi-square*. **Hasil:** Analisis statistik menggunakan uji *Chi-Square* menghasilkan *p-value* sebesar 0,000055 untuk tingkat pengetahuan; sebesar 0,00001 untuk sikap; dan 0,003316 untuk perilaku yang semuanya signifikan pada taraf *p-value* < 0,05. Hasil penelitian menunjukkan bahwa sebagian besar responden 83% memiliki tingkat pengetahuan yang tinggi tentang DBD, 77% responden memiliki tingkat sikap yang tinggi, dan 66% responden memiliki tingkat perilaku yang tinggi. Sebanyak 85% dari 67 responden tidak tertular demam berdarah. **Kesimpulan:** Terdapat hubungan yang bermakna antara tingkat pengetahuan, sikap, dan perilaku tentang DBD dengan kejadian DBD.

Kata kunci:
Hubungan, Demam berdarah, Petani, Pengetahuan

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INTRODUCTION

The incidence of *Dengue Fever* (DF) has increased dramatically worldwide in recent decades. According to the WHO, there were an estimated 390 million dengue infections in 2019, of which 96 million were symptomatic (WHO, 2019). The burden of dengue fever is highest in tropical and subtropical regions, with Southeast Asia, the Americas, and the Western Pacific being the most affected areas (Bhatt *et al*., 2013). The incidence of dengue fever in Southeast Asia varies by country and region, but it tends to be the highest in urban and peri-urban areas with high population density and inadequate sanitation and waste management (Lee *et al*., 2017). The tropical climate of Indonesia is conducive to the lives of animals and plants, but it provides a suitable environment for the spread of diseases, particularly those transmitted by vectors.

There are three factors that play a role in the transmission of dengue virus infection, namely humans, the virus itself, and the vector intermediary. In this case, the virus is transmitted to humans through the bite of the vector, which is the *Aedes aegypti* mosquito (Rahmawati, 2016). Dengue fever is characterized by symptoms such as high fever, severe headache, joint and muscle pain, nausea, vomiting, and a rash. In severe cases, dengue fever can lead to dengue hemorrhagic fever, causing bleeding, organ failure, and potentially fatal shock. There are four distinct serotypes of the dengue virus, and infection with one serotype does not provide immunity to the others. This means that individuals can be infected with dengue multiple times, with each subsequent infection potentially leading to more severe symptoms (Simmons *et al*., 2012). According to the WHO (2019), the mortality rate of dengue fever is generally low, but severe cases can lead to *Dengue Hemorrhagic Fever* (DHF) or *Dengue Shock Syndrome* (DSS), which can be fatal. The global mortality rate for DHF is estimated to be around 2.5%.

Dengue Fever (DF) outbreaks usually occur in endemic areas and are associated with the rainy season. High rainfall can create the potential for water puddles and increase mosquito populations. Furthermore, high humidity facilitates mosquito breeding. The activity of dengue vectors during this time can lead to the transmission of dengue fever to humans through the *Aedes* vector (Decree of The Minister of Health, 2021). In Southeast Asia, Indonesia ranks second after Thailand in terms of the number of cases. The Ministry of Health reported that until the 39th week of 2021, DF has reached 94.335 cases with 853 deaths, covering 30 provinces and resulting in outbreaks in 293 cities across 17 provinces (Ministry of Health, 2021).

Dengue Fever (DF) is endemic in Indonesia with seasonal outbreaks occurring each year during the rainy season. According to the Ministry of Health, there were over 150.000 reported cases of dengue fever in Indonesia in 2020 (Ministry of Health, 2020). A study conducted in Jakarta found that the incidence of dengue fever was higher in areas with high population density, high mobility, and inadequate waste management. The study also found that the incidence of dengue fever was positively correlated with temperature and humidity (Rojali *et al*., 2023).

Several studies have shown that there is a correlation between knowledge about dengue fever and its incidence. Individuals with a high level of knowledge about dengue fever are more likely to take preventive measures, such as using mosquito repellent, wearing protective clothing, and eliminating mosquito breeding sites, which can reduce the incidence of dengue fever (Suaya *et al*., 2009). In a study conducted in Malaysia, it was found that a high level of knowledge about dengue fever was associated with a lower incidence of the disease. The study concluded that improving knowledge about dengue fever prevention and control could be an effective strategy for reducing the incidence of the disease (Wong *et al*., 2015). Further, a study in Brazil found that individuals with a high level of knowledge about dengue fever were more likely to take preventive measures, such as eliminating mosquito breeding sites and using mosquito repellent, leading to a lower incidence of the disease (Santos *et al*., 2018).

According to Rosenstock (1974) in "Historical Origins of the Health Belief Model" (Health Education Monographs), the Health Belief Model posits that individuals' knowledge, attitudes, and behaviors are influenced by their perception of the severity of a health threat, their susceptibility to the threat, the benefits of taking preventive actions, and the barriers to taking those actions. In the context of dengue fever, individuals with higher knowledge about the disease, a perception of personal susceptibility, and a belief in the effectiveness of preventive behaviors are more likely to engage in those behaviors. Another study has shown that knowledge, behavior, and attitudes of the general population are crucial factors in preventing dengue virus infection (Alyousefi *et al*., 2016).

A study in Thailand found that knowledge about dengue fever was a significant predictor of the incidence of the disease. The study concluded that increasing knowledge about dengue fever prevention and control could lead to a reduction in the incidence of the disease (Thisyakorn *et al*., 2022). Another study in Thailand conducted by Koenraadt *et al*. (2006) established a direct correlation between knowledge about *Dengue Fever* (DF) prevention and preventive actions against mosquito breeding sites. Thus, if parents have adequate knowledge about DF and its prevention, their children may be able to avoid the risk of contracting DF.

A study in India found that individuals with a high level of knowledge, attitudes, and behaviors about dengue fever were more likely to take preventive measures, such as using mosquito nets and repellent,

which led to a lower incidence of the disease. The study concluded that increasing knowledge about dengue fever prevention and control could be an effective strategy for reducing the incidence of the disease (Nayak *et al*., 2015). A study in Vietnam found that knowledge about dengue fever was associated with the use of preventive measures, which led to a lower incidence of the disease. The study concluded that improving knowledge and behaviors about dengue fever prevention and control could be an effective strategy for reducing the incidence of the disease (Rakhmani *et al*., 2018).

A study in Indonesia conducted in the city of Yogyakarta by Sulistyawati *et al*. (2023) found that individuals with a high level of knowledge about dengue fever had a lower incidence of the disease compared to those with a low level of knowledge. Another study by Yuliantari *et al*. (2022) in Yogyakarta found that knowledge about dengue fever and its prevention was positively associated with preventive behavior. The study concluded that improving knowledge about dengue fever and its prevention could lead to a reduction in the incidence of the disease.

Another study conducted in Indonesia, in West Java by Sari *et al*. (2017) showed that there was a significant relationship between knowledge and prevention practices of dengue fever among the residents of the area. The study concluded that a high level of knowledge and positive attitudes towards dengue prevention practices could lead to a reduction in the incidence of dengue fever. Another study showed that there was a significant relationship between knowledge about dengue fever and the incidence of the disease among pregnant women. The study revealed that pregnant women with higher levels of knowledge about dengue fever were more likely to engage in preventive behaviors, which led to a lower incidence of the disease (Fatmawati *et al*., 2019). Another example is the preliminary study conducted from November 2021 through interviews about knowledge of DF, which is potentially supportive of the occurrence of DF, as evidenced by 20 patients that visited the Public Health Center in Mayangrejo, Kalitidu. Fifteen of whom stated that they worked as farmers and had a poor understanding of DF, while the other five claimed to have a good understanding of DF.

Based on the above background, the researcher is interested in conducting further research on the relationship between the level of knowledge, attitudes, and behaviors about *Dengue Fever* (DF) among farm workers and the incidence of DF in Mayangrejo Village, Kalitidu Subdistrict, Bojonegoro. The general objective of this research is to determine the relationship between the level of knowledge, attitudes, and behaviors about DF among farm workers and the incidence of DF. The specific objectives of this research are to identify the level of knowledge, attitudes, and behaviors of respondents about DF, to identify the incidence of DF, and to analyze the relationship between the level of knowledge, attitudes, and behaviors about DF and the incidence of DF.

MATERIAL AND METHOD

This research employed a non-experimental research method with a correlational research design and a cross-sectional research plan. The population for this research consisted of all *Heads of Households* (HHs) working as farmers in Mayangrejo Village, Kalitidu Subdistrict, Bojonegoro, totaling 193 HHs. The probability sampling technique, specifically simple random sampling, was used to select 67 respondents. The independent variables under research are knowledge, behavior, and attitude, while the dependent variable under research is the incidence of dengue fever among farmers in the Kalitidu Subdistrict, Bojonegoro. The research was conducted in Mayangrejo Village, Kalitidu Subdistrict, Bojonegoro, from the second week to the fourth week of January 2022. The data were obtained through a questionnaire and analyzed using the *Chi-square* statistical test. The primary data used in this research were collected from the questionnaire, which contained one question about the incidence of dengue fever and 20 statements about dengue fever knowledge. Secondary data used in this research were obtained from the documentation (ethical number: 85/EA/KEPK/2022) of the number of people who experienced dengue fever in Mayangrejo Village, Kalitidu Subdistrict, Bojonegoro.

RESULT

In this research, 67 heads of farming households were surveyed and selected as respondents. Their data were examined using the *Chi-square* test. 83% it was discovered that the majority of respondents had a high level of knowledge about dengue, 77% had a high level of attitudes, and 66% had a high level of behaviors. Out of the 67 respondents, a large percentage 85% had not contracted dengue fever. These findings were supported by statistical analysis using the *Chi-square* test, resulting in a *p-value* of 0.000055 for knowledge, 0.00001 for attitudes, and 0.003316 for behaviors, all of which were significant at a level of *p-value* < 0.05. Therefore, based on these findings, it can be concluded that there is a significant correlation between the level of knowledge, behaviors, and attitudes about *Dengue Hemorrhagic Fever (*DHF) and the incidence of dengue fever.

Table 1. Characteristics of respondents based on education

Education level	Frequency	Percentage (%)
Elementary school	8	11.9
Junior high school	11	16.4
Senior high school	36	53.7
Bachelor	12	17.9
Total	**67**	**100**

Table 2. The description of knowledge, attitude, and behavior levels among respondents

Variable	High		Moderate	
	n	%	n	%
Knowledge	56	83	11	17
Attitudes	51	77	16	23
Behaviors	44	66	23	34

Table 3. The correlation between knowledge, attitudes, behaviors, and incident about dengue fever among respondents

Variable	Yes	No	Total	*p-value*
Incident / knowledge				
Moderate	6	5	11	0.00055
High	4	52	56	
Total	**10**	**57**	**67**	
Incident / attitudes				
Moderate	9	7	16	0.00001
High	1	50	51	
Total	**10**	**57**	**67**	
Incident / behaviors				
Moderate	8	15	23	0.003316
High	2	42	44	
Total	**10**	**57**	**67**	

Based on Table 1, shows 36 people or 53.73% of the total respondents have a senior high school education level. Based on Table 2, conclude that 56 people or around 83% of the total respondents, have high knowledge about *Dengue Hemorrhagic Fever (*DHF), 51 people or around 77% of the total respondents have high attitude level about DHF, and 44 people or around 66% of the total respondents have high behavior level about DHF. Table 3 shows that the majority of respondents did not experience dengue fever, with 52 people having a high level of knowledge (*p-value* 0.00055 < 0.05), 50 people having a high level of attitudes (*p-value* 0.00001 < 0.05), and 42 people having a high level of behaviors (*p-value* 0.003316 < 0.05). Therefore, it can be concluded that there is a significant relationship between the level of dengue fever knowledge, attitudes, and behaviors among farmers and the incidence of dengue fever in Mayangrejo Village, Kalitidu Subdistrict, Bojonegoro.

DISCUSSION

This research aimed to measure the knowledge, attitude, and behavior levels of 67 respondents working as farmers in Mayangrejo Village, Kalitidu Subdistrict, Bojonegoro, regarding dengue fever and its occurrence. The majority of the respondents had a moderate level of education, while 52 of them had a high level of knowledge. Those with a high level of knowledge, attitudes, and behaviors mostly did not have any family members who had dengue fever, while those with a moderate level of knowledge, attitudes, and behaviors mostly had family members who had dengue fever. The results of the data analysis using a *Chi-square* test with a *p-value* of knowledge being 0.000055, *p-value* of attitudes being 0.00001, and *p-value* of behaviors being 0.003316 showed a significant relationship between the knowledge of dengue fever and its incidence.

Knowledge is comprised of various facts and theories that enable individuals to solve problems related to health. This knowledge can be acquired through direct experience or learning from others' experiences. Behavioral factors, including knowledge, attitudes, and actions, are generally neutral in the context of infectious diseases. However, improper attitudes and behaviors can increase the risk of disease, and these should be avoided. Having good knowledge, attitudes, and behaviors about health can help farmers to avoid or minimize the potential risks of diseases. They can also adopt behaviors that promote better health status.

According to Nani (2017) the frequency of dengue fever cases can be decreased by increasing efforts to manage the dengue fever vector through increased awareness and attitudes in society. This is consistent with the findings of Listyorini (2016) study, which claims that skills, dispositions, information accessibility and the function of health professionals are elements that affect how people eradicate mosquito nests. According to Thomas and Naniecki (1920) as cited in Wawan and Dewi (2011), they assert that attitude is a predisposition to perform or not perform a particular behavior. Attitude consists of cognitive components, which are generally related to thoughts and learned experiences, while behavior tends to influence responses, whether they are in accordance with or contrary to it. This cognitive process can occur through direct experiences, both positive and negative. Attitude is an individual's awareness of events in their environment, similar to how society's attitude towards dengue fever prevention behavior is. Through attitudes, we can understand the consciousness process that determines actual actions and what individuals may do in their social lives.

The findings of this research are also in line with a study conducted by Mokodompit *et al*. (2019) on the relationship between knowledge and attitudes of household heads and dengue mosquito breeding eradication actions in the Paniki Bawah Subdistrict of Mapanget, Manado City. Based on the statistical tests conducted in that research, it was found that there is a relationship between community attitudes and mosquito breeding eradication actions, with a probability value (*p-value* 0.02 < α-level 0.05). Negative attitudes are associated with the likelihood of performing negative actions, as observed in several families still leaving hanging clothes inside their houses.

CONCLUSION

The findings revealed that the majority of respondents (83%) had a high level of knowledge about dengue, 77% had a high level of attitudes, and 66% had a high level of behaviors. Out of the 67 respondents, a large percentage (85%) had not contracted dengue fever. These findings are supported by statistical analysis using the *Chi-square* test, resulting in a *p-value* of 0.000055 for knowledge, 0.00001 for attitudes, and 0.003316 for behaviors, all of which are significant at a level of *p-value* < 0.05. Therefore, based on these findings, it can be concluded that there is a significant correlation between the level of knowledge, behaviors, and attitudes about DHF and the incidence of dengue fever. The correlation between knowledge, attitudes, behaviors and incidence of dengue fever among farmers is an important area of research that has implications for public health. Further studies are needed to explore this relationship in other regions of Indonesia and to identify effective strategies for educating and raising awareness among farmers about dengue fever.

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