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Enhancing Knowledge on Prevention of Dengue Hemorrhagic Fever (DHF) through Focus Group Discussion (FGD) and Training of Trainers (TOT) Approaches during the Pandemic Period at Dupak Health Center, Surabaya

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Abstract

Objective: The COVID-19 pandemic that has occurred over the past 2 years has had a very significant impact on various sectors, especially public health. Indonesia, which is a tropical country, especially has to deal with cases of dengue disease which are still quite high. The government's social distancing policy that was in effect during the COVID-19 pandemic caused the control and prevention of dengue fever to be neglected by the public.

Purpose: This study aims to increase public understanding of dengue prevention through Focus Group Discussion (FGD) and Training of Trainer (TOT) approaches.

Method: This research was conducted using 2 approaches, namely FGD and TOT, which were followed by 15 and 30 public workers participants. The FGD and TOT were carried out by discussing and giving lectures to participants, then participants were given a pre-test and post-test question sheets.

Result: As many as 93.3% of participants already know the causes, methods of prevention, and types of dengue mosquitoes. However, there were still 60% of participants understood the handling of mosquito larvae correctly. After the FGD and TOT were carried out, it was seen that there was an increase in participants' understanding.

Conclusion: The FGD and TOT approaches can increase public understanding of the causes, prevention, and proper inspection of DHF mosquito larvae.

Keywords: *covid-19, dengue virus, medicine, health, public health.*

Introduction

The COVID-19 pandemic that has occurred over the past 2 years has had a very significant impact on various sectors, especially public health. Dengue Hemorrhagic Fever (DHF) is one of several infectious

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diseases that is a health problem in several countries, especially sub-tropical, tropical and sub-tropical countries.[1]genotype, and lineage information Indonesia, which has a population of 251 million, is one of the largest countries in the DHF endemic area. In 2015 there were 129,650 cases of DHF in Indonesia. In most cases, single outbreak reports, and clinical and virological studies in DHF patients in a particular geographic area and year have been used to describe the epidemiology of dengue in Indonesia.[2]dengue vector-density and human mobility cause rapid spread of dengue virus in Indonesia. We investigated the changes in dengue haemorrhagic fever (DHF

According to data from the East Java Provincial Health Office, as of January 1-27 2022, there were 1,220 dengue fever sufferers in East Java, with 21 deaths (CFR = 1.7%) dominated by ages 5-14 years. This figure increases when compared to 2021 when dengue patients in East Java were recorded as 668 people with 5 deaths. The total number of dengue patients in 2021 in East Java was 6,417 people, with a total number of deaths of 71 people (CFR = 1.1%).[3]

Dengue virus (DENV) is one of the Flaviviridae group and has 2 genetically different serotypes (DENV 1-4), which are transmitted to humans by *Aedes aegypti* and *Aedes albopictus* mosquitoes.[4]we aimed to systematically review and analyze the association between different blood groups and severity of dengue. We searched nine databases for eligible papers reporting prevalence, distribution, and frequency of blood group type among dengue patients. Network meta-analysis using R software was used to analyze the data. Of a total of 63 reports screened, we included 10 studies with total sample size 1977 patients (1382 DF and 595 DHF DENV infection usually occurs once a year and as many as 95% have symptoms. A research model predicts that by 2085, half of the world's population may experience massive DENV transmission.[5]clinical presentation, and virology will facilitate appropriate clinical management and public health policy. Methodology/Principal findings A multicenter observational cohort study was conducted in Indonesia to assess causes of acute fever requiring hospitalization. Clinical information and specimens were collected at enrollment, 14–28 days, and 3 months from 1,486 children and adults. Total of 468 (31.9% In Indonesia, clinical presentation, standard laboratory evaluation, and rapid diagnostic tests are usually used to establish the diagnosis of DENV infection.[6]

The pandemic that occurred in 2020 required all activities to be carried out from home because the lockdown and social distancing made the control and prevention of dengue fever neglected. This certainly has an impact on the incidence of dengue infection, considering that the Aedes aegypti mosquito infects more often from inside the house. Health workers' service has a very important role to provide education to the public to reduce dengue infection.[7] One of the ways to prevent dengue fever is by examining mosquito larvae in clean puddles of water. The community needs to understand how to properly check larvae, therefore this training aims to increase public understanding of how to carry out larval checks properly so that dengue prevention can be carried out optimally.

Method

According to the situation analysis, it is necessary to make efforts to increase the understanding and awareness of the public and geologists, especially in the Dupak area, Surabaya, as the key to disseminating information, especially during the pandemic to overcome DHF. The methods used to overcome these problems include:

1. Partner Problem Analysis

   The Covid-19 pandemic has resulted in the government requiring lockdown and social distancing (social restrictions) to be enforced. This resulted in the control and prevention of dengue fever being disrupted because most of the resources and medical personnel were directed to control the spread of Covid-19. In addition, the activity of reducing the DHF vector population requires a lot of participation from the community and bums, where this activity is often hampered due to social restrictions. This makes dengue vector control activities during the pandemic also limited so that the proliferation and spread of dengue vectors will increase and affect the number of dengue cases.

2. Prevention Socialization of DHF

The dissemination of DHF prevention was carried out through an approach to the community through discussions (FGD), interviews, and training (TOT) on monitoring mosquito larvae that cause DHF. The target population for the TOT activity is 30 public workers at the Dupak Health Center. The target population for the FGD activities was 2 community groups, each group consisting of 7-8 people, with the total FGD participants being 15 people. This area was chosen as the target area because the population is quite dense and there has been an increase in dengue cases in recent times.

This community service activity will be carried out for 2 days. The Training of Trainer (TOT) activities for health cadres will be held on the first day by inviting participants, implementing partners, and 3 resource persons. On the second day, FGDs will be held in 2 community groups by inviting participants, implementing partners, and 2 resource persons. Evaluation of this community service activity was carried out pre-test and post-test before and after the TOT and FGD activities.

Result

The last level of education distribution

Table 1. Distribution of the last level of education FGD participant

The last level of education	n	Percentage (%)
SD	0	0
SMP	2	13.3
SMA	3	20
SLTA	7	46.7
SMK	1	6.6
D3	1	6.6
S1	1	6.6

Table 1 shows that participants have the latest education S1 6.6% (1 person), D3 6.6% (1 person), SMA 20% (3 people), Senior High School 46.7% (7 people), SMK 6.6% (1 person), SMP 13.3% (2 persons). Most of the participants had the last education equivalent to SMA/SLTA.

Table 2. Distribution of the last level of education TOT participant

The last level of education	n	Percentage (%)
Not in School	1	3.3
SD	2	6.7
SMP	6	20
SMA	10	33.3
SMEA	2	6.7
SMK	3	10
D3	1	3.3

Table 2 shows that participants have the latest education D3 3.3% (1 person), SMA 33.3% (10 people), SMEA 6.7% (2 people), SMK 10% (3 people), SMP 20% (6 people), SD 6.7% (2 people) and not in school 3.3% (1 person). Most of the participants had the last education equivalent to high school.

Training of Trainer (TOT)

The TOT activity was attended by 30 people who were public workers service. The implementation of the TOT is carried out by providing counseling through presentations on dengue prevention. During the TOT, participants were given a pre-test and a post-test with 10 questions each. The results of the pre-test and post-test are shown in Figure 1.

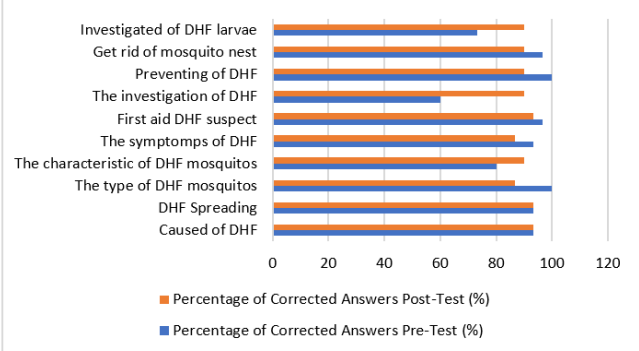

Figure 1. An overview of the pre-test and post-test values of the TOT public workers, in Dupak Health Center, Surabaya.

Figure 1 shows that most of the participants (90%) (28 people) already understand the causes, transmission, and types of DHF mosquitoes. However, only 60% (18 people) of the participants understood the proper epidemiological investigation of DHF.

The mean pre-test and post-test TOT scores are presented in Figure 2.

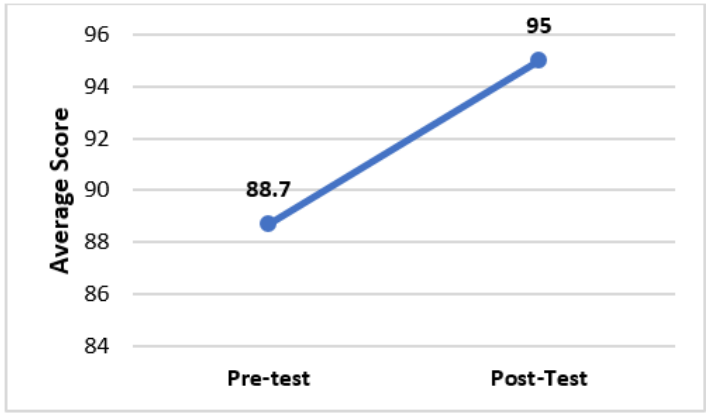

Figure 2. Average results of pre-test and post-test TOT Dupak Health Center, Surabaya.

Focus Group Discussion (FGD)

The Focused Group Discussion (FGD) was attended by 15 people, 8 women and 7 men from Dupak, Surabaya. The age range is between 28-55 years with junior high school until diploma education. The results of the pre-test and post-test are presented in Figure 2.

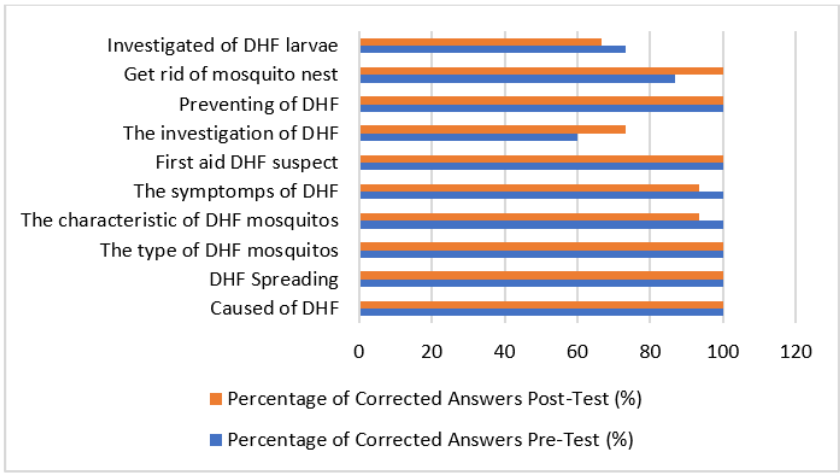

Figure 3. Description of the pre-test and post-test scores of the FGD public workers, Dupak Health Center, Surabaya.

Figure 3 shows that most of the participants (15 people) already understand the causes, modes of transmission, and types of DHF mosquitoes. However, it was seen that only about 60% (9 people) of the participants had understood the investigation activities and how to check mosquito larvae correctly. After the FGD was conducted, it can be seen from Figure 3 that there was an increase of 20%. The mean value of pre-test and post-test FGD is shown in Figure 4, there is only a difference of 0.7%.

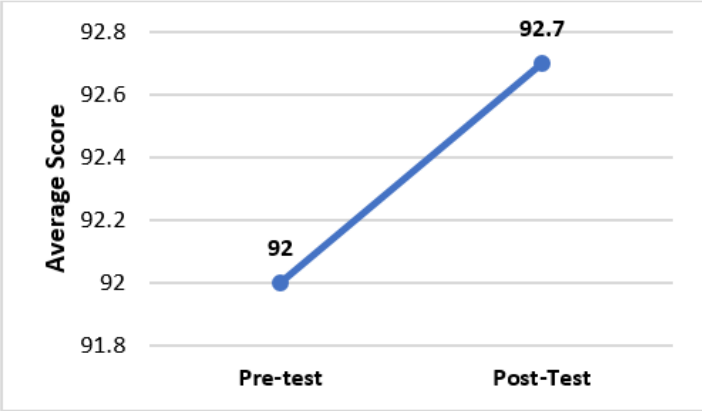

Figure 4. Average results of pre-test and post-test FGD Dupak Health Center, Surabaya.

Discussion

This study found that most people in the Dupak area, Surabaya already have good knowledge about DHF. The results of the TOT pre-test showed about 93.3% of the participants already knew about the prevention and transmission of DHF. Participants also understood the scientific name of the mosquito that causes DHF. Dengue fever is caused by *Aedes aegypti* and *Aedes albopictus* mosquitoes with body characteristics having black and white stripes. This mosquito originated in Africa but is now found in tropical and sub-tropical countries with warm temperatures. In Asia, the first dengue vector is *Aedes aegypti,* and *Aedes albopictus* is a secondary vector.[6] The natural habitat of the Aedes mosquito, especially in clean water puddles, is a breeding ground for mosquitoes, especially during the rainy season.[8]

There are four serotypes of the virus called DENV, DENV-1, DENV-2, DENV-3, and 4. All of these virus serotypes have been found in several parts of Indonesia. The results of research in Indonesia show that DENV-3 is strongly associated with severe dengue cases and is the serotype with the most widespread distribution followed by DENV-2, DENV-1, and DENV-4. If a person is infected with one of the four serotypes, it will cause immunity lifetime against the infecting viral serotype, but not for other serotypes. Although the four serotypes of the virus have the same antigenic power, they have differences in generating cross-protection, even though it has only been a few months since the virus infection occurred.[9]

Dengue virus that enters the human body will multiply in cells that last 5-7 days. As a result of the infection, an immune response, both humoral and cellular, appears, among others, anti-hemagglutinin, anti-neutralization, and anti-complement. IgG and IgM are antibodies that generally appear, in primary dengue infection antibodies begin to form, and in subsequent infections, antibody levels in the body will increase. In primary infection, antibodies that have neutralizing activity are formed that can recognize protein E and monoclonal antibodies against NS-1, Pre-M, and NS-3 from viruses that cause infection. In the end, many viruses are eliminated and the patient recovers, then there is lifelong immunity to the same virus serotype, but if there are non-neutralizing antibodies that stimulate viral replication, the patient's condition will become more severe.[10]

The results of the discussions and interviews showed that many public workers already understood how to control and prevent the spread of DHF. One of the efforts that can be done to overcome the increase in DHF is to do 3M. Activities 3M's activities include, firstly, draining (cleaning) bathtubs, flower vases, pet drinking containers, or dispenser mats. Second, close the meeting of the Water Shelter. For landfills that cannot be drained or closed, you can give larvicides. Third, get rid of or recycle used items such as plastic bottles, used cans, etc.[3] Several factors that influence the spread of DHF are population density, population mobility, community behavior, global climate change, economic growth, and availability of clean water.[9]

Environmental health is an important factor in social life. The environment is one of the influential factors in supporting the occurrence of various diseases, one of which is DHF. Environmental changes in the long term determine the pattern of spread of dengue and malaria vector infectious diseases in an ecosystem.[10]

According to Dawe *et al.,* (2020)[11] The factors that influence the spread of the dengue virus are mosquito density. The higher the density of the *Aedes aegypti* mosquito, the higher the risk of contracting dengue disease. Mosquito density can increase in flower vases, used cans, and water storage containers. The second factor is the density of houses. The *Aedes aegypti* mosquito has a short flight of 100 meters. So that mosquitoes need a place to rest before returning to fly to another place. If people's houses are close to each other, mosquitoes will easily move from one place to another, making it easier for transmission.

The last level of education also affects knowledge about the handling and prevention of DHF. The higher a person's level of education, the level of knowledge will also increase. Health workers have a role as a driver or reinforcement of healthy behavior in the community to achieve health. The existence of active community participation, accompanied by adequate education in this program is believed to be able to accelerate the eradication of vector breeding sites.[12] The results of this study are supported by research by Nuryanti *et al.,* (2011)[13] which states that there is a relationship between the role of health workers and the behavior of eradicating dengue mosquito nests in Karangjati village. The results of this study are also following Green's theory that good dengue prevention is not only influenced by knowledge as a predisposing factor but also influenced by the role of officers in this case health workers.

Conclusion

The results of this study indicate that FGD and TOT training can increase public knowledge in efforts to prevent and treat DHF. Health workers and public workers have a very important role in providing education to the public regarding the prevention, transmission, and proper handling of DHF.

Ethical Clearance

This research has been approved by the ethical commission Faculty of Medicine, Universitas Airlangga with the number 194/EC/KEPK/FKUA/2022.

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Conflict of Interest

The authors declare that there is no conflict of interest.

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