Meta Analysis: The Association Of Knowledge And Education With Preventing Behavior Of Dengue Hemorrhagic Fever (DHF)

Budi Simanungkalit[1], Husaini[1], Lenie Marlinae[2], Meitria Syahadatina[1], Rosihan Adhani[1]

[1]Magister of Public Health, Faculty of Medicine, Lambung Mangkurat University
[2]Public Health Study Program, Faculty of Medicine, Lambung Mangkurat University
*Author correspondence:Bintangara@ulm.ac.id

DOI: 10.29322/IJSRP.12.06.2022.p12632
http://dx.doi.org/10.29322/IJSRP.12.06.2022.p12632

Paper Received Date: 22nd May 2022
Paper Acceptance Date: 7th June 2022
Paper Publication Date: 14th June 2022

Abstract: Dengue Hemorrhagic Fever (DHF) is still a global public health problem, especially in tropical and subtropical regions, including Indonesia. DHF is an acute infectious disease caused by the dengue virus which is transmitted through the bite of the Aedes (Ae) mosquito. This study aims to systematically examine the association between knowledge and education with dengue prevention behavior in Indonesia.
This study uses a meta-analysis research design with a correlation meta-analysis research design using secondary data analysis. The total articles obtained from the ResearchGate, Garuda and Google Scholar databases are 587 articles. A brief screening was conducted through the title and its relevance to this study, so there were 535 articles that were excluded because they could not be accessed by full text, literature review articles, duplication, paid articles and not according to keywords so that there were 52 articles remaining. Then the articles were tested for feasibility by looking at the suitability of the title with the content, research design and downloadable, then there were 38 more articles that were excluded so that the remaining 14 articles met the inclusion criteria and a meta-analysis will be carried out. The results of data analysis on the Forest Plot association between knowledge and Prevention Behavior of Dengue Hemorrhagic Fever (DHF) with p value < 0.05, namely p 0.00001 and pooled odds ratio value of 4.18 (95% CI 2.40–7.28). The results of data analysis on the combined Forest Plot between education and DHF prevention behavior showed a p value < 0.05, namely p = 0.00001 and a pooled odds ratio value of 7.33 (95% CI 3.85–1.94). People who have good knowledge 4.18 times will increase dengue prevention behavior and people who have good education 7.33 times will increase dengue prevention behavior.

Keywords: Dengue Hemorrhagic Fever, Education Level, Knowledge, Behavior

I. INTRODUCTION

Dengue Hemorrhagic Fever (DHF) is an environmental-based acute viral infection that can cause morbidity and mortality in the community and is still a health problem that has not been properly resolved, especially in tropical and subtropical regions including Indonesia. Since it was first reported in 1968 in Jakarta and Surabaya, the incidence of dengue fever has tended to increase and its distribution area has become wider in almost all districts/cities in Indonesia in the last 3 (three) decades. DHF is estimated to still tend to increase in distribution due to lack of knowledge about clean and healthy living behavior and lack of knowledge about preventing dengue disease (Kemenkes RI, 2017).

According to the World Health Organization, cases of DHF have increased dramatically worldwide in recent decades. It is estimated that more than 3.9 billion people (more than 40% of the world's population) are at risk of being infected with dengue. Currently, dengue is an endemic disease in more than 100 countries. The number of dengue fever cases reported to WHO has increased more than 8-fold over the last two decades, from 505,430 cases in 2000, to more than 2.4 million in 2010 and 4.2 million in 2019 (WHO, 2019) . Based on data from the Ministry of Health in 2018, it is known that there were 65,602 dengue cases in Indonesia. DHF cases in Indonesia increased by 110.55% in 2019 with a total of 138,127 cases. Deaths due to DHF in 2019 also increased compared to 2018 from 467 to 919 deaths.

Knowledge, attitude, and behavior are factors that influence the prevention of DHF. Community behavior is closely related to clean living habits and awareness of the dangers of DHF. Human behavior from the level of health is influenced by 2 main factors, namely behavioral factors (behavior causes) and non-behavioral causes. Furthermore, behavior is influenced by 3 main factors, which are summarized in the acronym PREDECE: Predisposing, Enabling, Reinforcing Causes in Educational Diagnosis

and Evaluation (Green, 2005). The level of education also affects a person's knowledge, health knowledge will affect behavior as an intermediate impact of health education, then health behavior will affect the increase in public health indicators as the output of health education (Widyatama, 2017).

The facts of the research gap related to the association between education and knowledge and prevention of DHF make prospective researchers interested in mapping research results through meta-analysis, because the results of the study state that not all prevention of DHF is related to education and knowledge because there are many related factors other than 2 variables. These factors contribute to the prevention of DHF such as other predisposing factors (age, gender, occupation, income, number of families), supporting factors (health facilities for the community and health services), and driving factors (religious leaders, attitudes and behaviors of health workers) that contribute to the prevention of DHF. need further analysis.

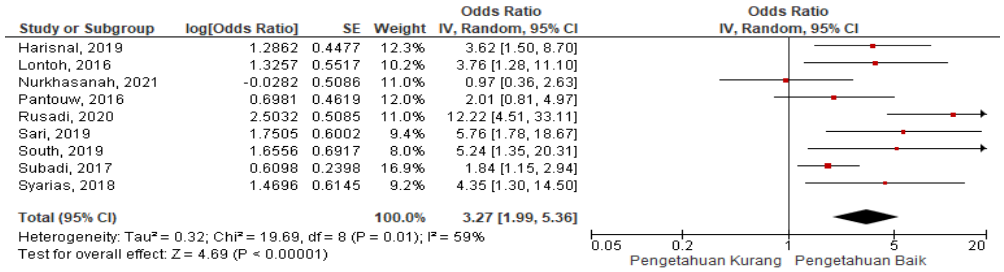
II. RESEACRH METHOD

Association between Knowledge and Prevention Behavior of Dengue Hemorrhagic Fever (DHF) (Total)

a. Forest Plot

The results of the calculation of the effect size of the study for the association between knowledge and prevention behavior of Dengue Hemorrhagic Fever (DHF) are as follows. In the analysis using RevMan 5.4 the number of studies that can be analyzed because it has complete data is 9 studies. Details of the analysis of the association between knowledge and Preventive Behavior of Dengue Hemorrhagic Fever (DHF), can be seen in the Forest Plot below:

Table 4.2 Forest Plot Association of Knowledge with Prevention Behavior of Dengue Hemorrhagic Fever (DHF) (Total)



Information:

Odds Ratio of each study

Combined Odds Ratio

| : Odds ratio - 1

Based on table 4.2 shows the results of the analysis of 9 studies of the association between knowledge and prevention behavior of dengue hemorrhagic fever (DHF) and analyzed using the fixed effect model analysis model. The results of the heterogeneity test showed that the variation in the study was highly heterogeneous, with p value = 0.01 and the value of variation between studies (I2) was 59%. The results of data analysis displayed on the forest plot show that there is a association between knowledge and prevention of dengue hemorrhagic fever (DHF) with a p value <0.05, namely p 0.00001 and a pooled odds ratio value of 3.27 (95% CI 1, 99 – 5.36), so it can be concluded that high knowledge has 3.27 times increased prevention behavior of dengue hemorrhagic fever (DHF) compared to low knowledge.

b. Funnel Plot

The technique used to identify the existence of publication bias in this study is to use a funnel plot. Trim and fill technique is also used to see the possibility of missing articles that cause the funnel plot to be asymmetrical. The following is a funnel plot of the association between knowledge and Preventive Behavior of Dengue Hemorrhagic Fever (DHF).

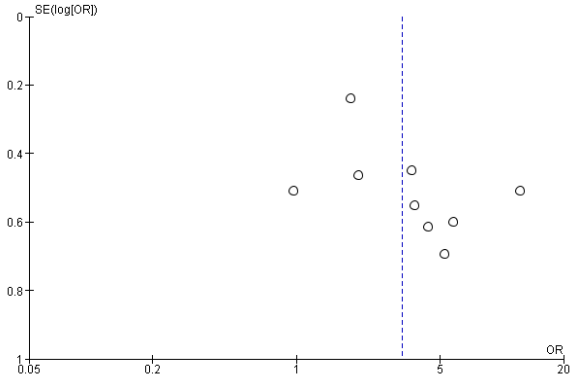


Figure 4.1 Funnel Plot Association of Knowledge with Dengue Hemorrhagic Fever (DHF) Prevention Behavior (Total)

Information:

: White diamond represents pooled OR

Based on Figure 4.1 the combined funnel plot of the association between knowledge and prevention behavior of Dengue Hemorrhagic Fever (DHF) shows that there is a publication bias which is indicated by noThe symmetry of the right plot is 6 and the left is 3 and the left plot has a standard error of 0.239 and the right plot has a standard error of 0.447. Plots above the curve indicate that the study had a high ES while studies with plots below the curve showing that the study had a low ES indicate that the study was biased in the meta-analysis.

Based on the results of the analysis in table 4.2. and attachments, it can be seen that the analysis of 9 studies shows different values of variance and weights. Subadi (2017) produces a weighted value of 16.9 which is the study with the largest weight, while South (2019) shows the lowest weight of 8.0. this is related to the number of samples in Subadi's research (2017) with a sample of 103 respondents and in research the smallest sample such as the South (2019) research sample has the smallest sample and also has the smallest weight, this states that the weight is influenced by the number of samples , weights are also influenced by variations in research data. The weights are inversely proportional to the variation of the data. Research with more varied data will have a smaller weight than research with smaller variations. In Subadi's research, there is a small variation in data so that with a large number of samples and a small value of data variation will produce the greatest weight value, while Nur Aini's research (2019), although the number of samples is not the smallest, the data variation shows a large value. this is what causes the weight to be small compared to saftaria. Based on the results of data analysis, it can be seen that the weight value is directly proportional to the data deviation value, because the greater the variation in the data, the smaller the weight and vice versa, the smaller the data variation, the greater the weight. Studies that show no association with p value > 0.05 have the smallest weight value.

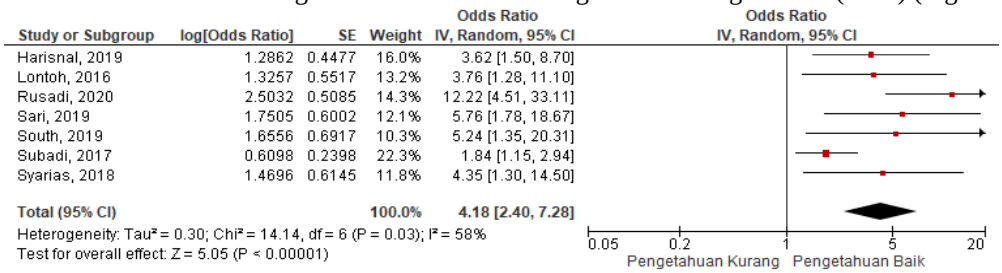
Judging from the heterogeneity test showing p 0.01 <0.05 then it is declared heterogeneous, if the heterogeneity test p <0.05 is declared heterogeneous, which means that the variation between studies has a role in the total variation, on the other hand if the heterogeneity test results show p> 0.05, it means variation between studies does not contribute to the total variation. The results of the heterogeneity test in these 9 studies were I2 = 59% and the p value > 0.01 was declared high heterogeneity. The variation of 9 research studies has an effect on the total variation after the combined effect is carried out. The 9 studies used have characteristics that are not the same with variations in the number of samples whose size does not match the population, so in the end it gives the effect of merging. The test results show low heterogeneity so that they use fixed effect models in measuring the combined effect. The result obtained is OR = 3.27 with 95% confidence interval between 1.99 to 5.36. The combined effect also produces a Z value of 4.69 and a p value of 0.00001. Statistically, the combined effect was significant if the p value <0.05 and the confidence interval did not touch the vertical line. As produced by the funnel flot, the confidence interval value of the combined effect does not touch the vertical line. This means that the null hypothesis is rejected, in other words there is a association between knowledge and prevention of dengue hemorrhagic fever (DHF).

Association of Knowledge with Prevention Behavior of Dengue Hemorrhagic Fever (DHF) (Significant Article)

a. Forest Plot

The results of the calculation of the effect size of the study for the association between knowledge and prevention behavior of Dengue Hemorrhagic Fever (DHF) are as follows. In the analysis using RevMan 5.4 the number of studies that can be analyzed because it has complete data is 7 studies. Details of the analysis of the association between knowledge and Preventive Behavior of Dengue Hemorrhagic Fever (DHF), can be seen in the Forest Plot below:

Table 4.3 Forest Plot Association of Knowledge with Prevention of Dengue Hemorrhagic Fever (DHF) (Significant Article)



Information:

Odds Ratio of each study
Combined Odds Ratio
: Odds ratio - 1

Based on table 4.3 shows the results of the analysis of 7 studies of the association between knowledge and prevention behavior of dengue hemorrhagic fever (DHF) and analyzed using the fixed effect model analysis model. The results of the heterogeneity test showed that the variation in the study was highly heterogeneous, with a p value of 0.03 and the value of variation between studies (I2) of 58%. The results of the analysis of the data displayed on the forest plot show that there is a association between knowledge and prevention behavior of dengue hemorrhagic fever (DHF) with a p value <0.05, namely p 0.00001 and a pooled odds ratio value of 4.18 (95% CI 2, 40 – 7,28), so it can be concluded that high knowledge has 4,18 times increased prevention behavior of dengue hemorrhagic fever (DHF) compared to low knowledge.

b. Funnel Plot

The technique used to identify the existence of publication bias in this study is to use a funnel plot. Trim and fill technique is also used to see the possibility of missing articles that cause the funnel plot to be asymmetrical. The following is a funnel plot of the association between knowledge and Preventive Behavior of Dengue Hemorrhagic Fever (DHF).

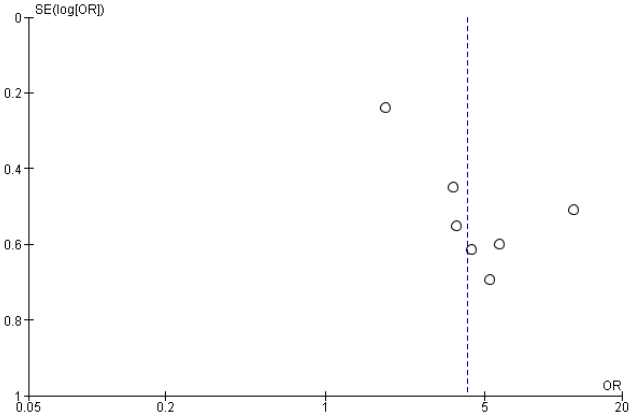
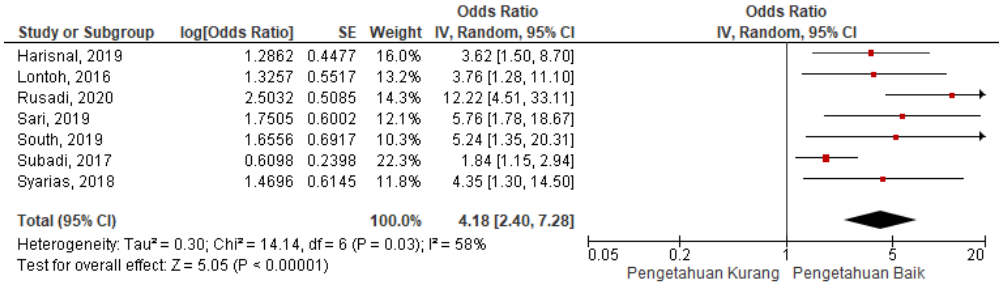


Figure 4.2 Funnel Plot Association of Knowledge with Dengue Hemorrhagic Fever (DHF) Prevention Behavior (Significant Article)

Based on Figure 4.2, the funnel plot of the association between knowledge and DHF prevention behavior shows that there is a publication bias which is indicated by the asymmetry of the right plot, there are 4 and the left is 3. The left plot has a standard error of 0.239 while the right plot has a standard error of 0.551. Plots above the curve indicate that the study has a high ES while studies with plots below the curve indicate that the study has a low ES indicates that the study is biased in the meta-analysis.

Based on the results of the analysis in table 4.3. and attachments, it can be seen that the analysis of 7 studies shows different values of variance and weights. Subadi (2017) produces a weighted value of 22.3, which is the study with the largest weight, while South (2019) shows the lowest weight of 10.3. This is related to the number of samples in Subadi's research (2017) with a sample of 103 respondents and in research the smallest sample such as the South (2019) research sample has the smallest sample and also has the smallest weight, this states that the weight is influenced by the number of samples. , weights are also influenced by variations in research data. The weights are inversely proportional to the variation of the data. Research with more varied data will have a smaller weight than research with smaller variations. In Subadi's research, there is a small variation in data so that with a large number of samples and a small value of data variation will produce the greatest weight value, while Nur Aini's research (2019), although the number of samples is not the smallest, the data variation shows a large value. this is what causes the weight to be small compared to saftaria. Based on the results of data analysis, it can be seen that the weight value is directly proportional to the data deviation value, because the greater the variation in the data, the smaller the weight and vice versa, the smaller the data variation, the greater the weight. Studies that show no association with p value > 0.05 have the smallest weight value.

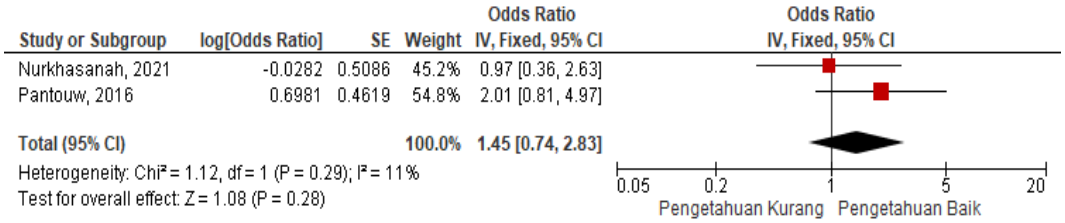


Judging from the heterogeneity test shows p 0.03 <0.05 then it is declared heterogeneous, if the heterogeneity test p <0.05 is declared heterogeneous, which means that the variation between studies has a role in the total variation, on the other hand if the heterogeneity test results show p> 0.05, it means variation between studies does not contribute to the total variation. The results of the heterogeneity test in these 7 studies were I2 = 58% and p value > 0.03 was declared high heterogeneity. The variation of 7 research studies has an effect on the total variation after the combined effect is carried out. The 7 studies used have characteristics that are not the same with variations in the number of samples whose size does not match the population, so in the end it gives the effect of merging. The test results show high heterogeneity so that they use fixed effect models in measuring the combined effect. The result obtained is OR = 4.18 with 95% confidence interval between 2.40 to 7.28. The combined effect also produces a Z value of 5.05 and a p value of 0.00001. Statistically, the combined effect was significant if the p value <0.05 and the confidence interval did not touch the vertical line. As produced by the funnel flot, the confidence interval value of the combined effect does not touch the vertical line. This means that the null hypothesis is rejected, in other words there is a association between knowledge and prevention of dengue hemorrhagic fever (DHF).

Association of Knowledge with Prevention of Dengue Hemorrhagic Fever (DHF) Behavior (Article Not Significant)

a. Forest Plot

Table 4.4 Forest Plot Association of Knowledge with Dengue Hemorrhagic Fever (DHF) Prevention Behavior (Not Significant Article)



Based on table 4.4, it shows the results of data analysis from 2 research studies whose results state that there is no association between knowledge and Prevention Behavior of Dengue Hemorrhagic Fever (DHF) and analyzed using the Fixed Effect Model analysis model. H, with a p value greater than 0.05 in the heterogeneity test, namely p = 0.29 and the value of variation between studies (I2) of 11%. The results of the data analysis displayed on the Forest Plot show that the results of the two studies show that there is no association between knowledge and Dengue Hemorrhagic Fever (DHF) Prevention Behavior. the pooled odds ratio value is 1.45 (95% CI 0.74 –2.83), so it can be concluded that people who have good knowledge, 1,

b. Funnel Plot

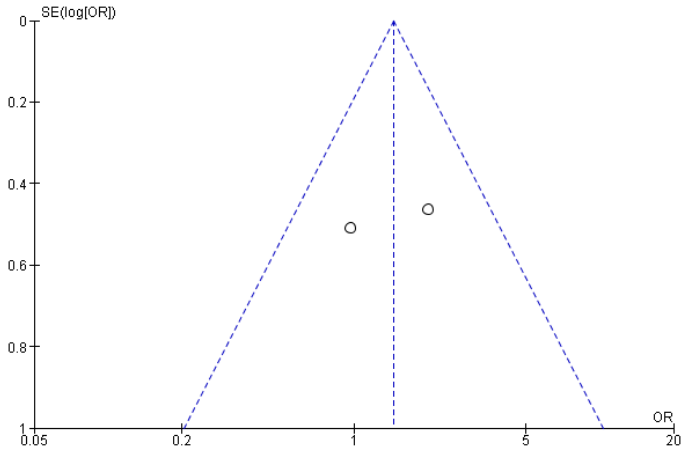


Figure 4.3 Funnel Plot Association of Knowledge with Dengue Hemorrhagic Fever (DHF) Prevention Behavior (Article Not Significant)

Based on Figure 4.3, the funnel plot of the association between knowledge and Prevention of Dengue Hemorrhagic Fever (DHF) behavior shows that there is a publication bias which is indicated by the symmetry of the right plot of 1 plot and 1 plot of the left. The left plot has a standard error of 0.5086 while the right plot has a standard error of 0.461. Plots above the curve indicate that the study has a high ES while studies with plots below the curve indicate that the study has a low ES and plots that touch the vertical line indicate that the study is biased in the meta-analysis.

Based on the results of the analysis in table 4.4. and attachments, it can be seen that the analysis of the 2 studies shows different values of variance and weights. Pantouw (2016) resulted in a weighted value of 54.8 which is the study with the largest weight, while Nurkhasanah (2021) shows the lowest weight of 45.2. This is related to the number of samples in Pantouw's research (2016) with a sample of 95 respondents and in research the smallest sample such as the research sample of Nurkhasanah (2021) has the smallest sample and also has the smallest weight, this states the weight is influenced by the number of samples , weights are also influenced by variations in research data. The weights are inversely proportional to the variation of the data. Research with more varied data will have a smaller weight than research with smaller variations. In Pantouw's research, the data variation is small so that with a large number of samples and a small data variation value will produce the largest weight value, while Nur Aini's research (2019), although the number of samples is not the smallest, the data variation shows a large value. This is what causes the weight to be small compared to Nurkhasanah. Based on the results of data analysis, it can be seen that the weight value is directly proportional to the data deviation value, because the greater the variation in the data, the smaller the weight and vice versa, the smaller the data variation, the greater the weight. Studies that show no association with p value > 0.05 have the smallest weight value.

Judging from the heterogeneity test showing p 0.29 <0.05 then it is declared homogeneous, if the heterogeneity test p> 0.05 means that the variation between studies does not give a role in the total variation, on the other hand if the heterogeneity test results show p <0.05 it is said to be heterogeneous. meaning that the variation between studies has a role in the total variation. The results of the heterogeneity test in these two studies were I2 = 11% and the p value <0.28 was declared low heterogeneity. The

variation of the 2 research studies has an effect on the total variation after the combined effect is carried out. The 2 studies used have characteristics that are not the same with variations in the number of samples whose size does not match the population, so in the end it gives the effect of merging. The test results show low heterogeneity so that they use fixed effect models in measuring the combined effect. The results obtained are OR = 1.45 with 95% confidence interval between 0.74 to 2.83. The combined effect also produces a Z value of 1.08 and a p value of 0.28. Statistically, the combined effect was significant if the p value < 0.05 and the confidence interval did not touch the vertical line. As produced by the funnel flot, the confidence interval value of the combined effect does not touch the vertical line. This means that the null hypothesis is rejected, in other words there is a association between knowledge and prevention of dengue hemorrhagic fever (DHF).

Association between Education and Prevention of Dengue Hemorrhagic Fever (DHF) (Total)

a. Forest Plot

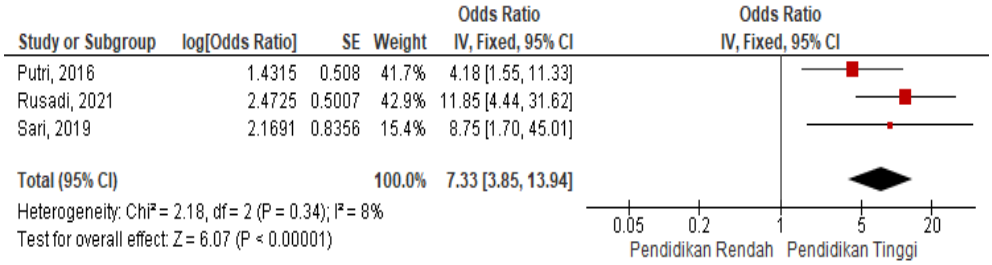


Table 4.5 Forest Plot Association of Education with Dengue Hemorrhagic Fever (DHF) Prevention Behavior (Total)

Based on table 4.5. shows the results of data analysis from 3 research studies, the results of which state there is a association and analyzed using the Fix Effect Model analysis model. The results of the heterogeneity test showed that the variation of the study was low heterogeneous, with a p value of 0.34 and the value of variation between studies (I2) of 8%. The results of the analysis of the data displayed on the forest plot show that there is a association between education and prevention of dengue hemorrhagic fever (DHF) with a p value <0.05, namely p > 0.00001 and a pooled odds ratio value of 7.33 (95% CI 3 .85 – 13.94), so it can be concluded that high education has 7.33 times increased prevention behavior of dengue hemorrhagic fever (DHF) compared to low education.

b. Funnel Plot

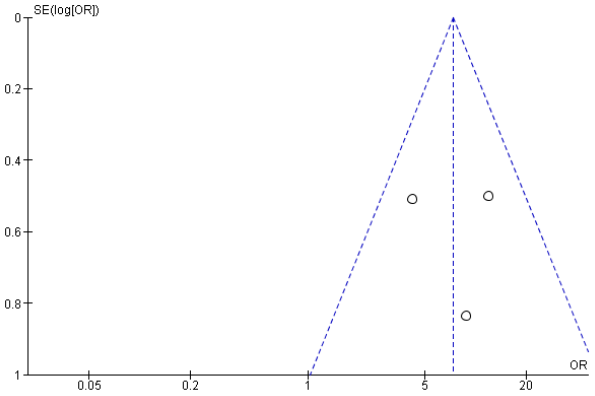


Figure 4.4 Funnel Plot Association of Education with Dengue Hemorrhagic Fever (DHF) Prevention Behavior (Total)

Based on Figure 4.4 the combined funnel plot of the association between education and dengue prevention behavior shows that there is a publication bias which is indicated by the asymmetry of the right plot of 2 and the left of 1 and the left plot having a standard error of 0.508 and the right plot having a standard error of 0.5007. Plots above the curve indicate that the study has a high ES while studies with plots below the curve indicate that the study has a low ES and plots that touch the vertical line indicate that the study is biased in the Meta-analysis.

Based on the results of the analysis in table 4.5. and attachments, it can be seen that the analysis of 3 studies shows different values of variance and weights. Rusadi (2021) produced a weighted value of 42.9, which is the study with the largest weight, while Sari (2019) showed the lowest weight of 15.4. This is related to the number of samples in Rusadi's research (2021) with a sample size of 93 respondents and in research the smallest samples such as the Sari (2019) research sample have the smallest sample and also have the smallest weight, this states that the weight is influenced by the number of samples , weights are also influenced by variations in research data. The weights are inversely proportional to the variation of the data. Research with more varied data will have a smaller weight than research with smaller variations. In Rusadi's research it has small data variations so that with a large number of samples and small data variation values will produce the largest weight values, while Nur Aini's

research (2019), although the number of samples is not the smallest, the data variation shows a large value. this is what causes the weight to be small compared to saftaria. Based on the results of data analysis, it can be seen that the weight value is directly proportional to the data deviation value, because the greater the variation in the data, the smaller the weight and vice versa, the smaller the data variation, the greater the weight. Studies that show no association with p value > 0.05 have the smallest weight value.

Judging from the heterogeneity test showing p 0.34 > 0.05 then it is declared heterogeneous, if the heterogeneity test p > 0.05 means that the variation between studies does not give a role in the total variation, on the other hand if the heterogeneity test results show p <0.05 it is said to be heterogeneous. meaning that the variation between studies has a role in the total variation. The results of the heterogeneity test in these 3 studies were I2 = 8% and the p value < 0.00001 was declared low heterogeneity. The variation of the 3 research studies has an effect on the total variation after the combined effect is carried out. The 3 studies used have characteristics that are not the same with variations in the number of samples whose size does not match the population, so in the end it gives the effect of merging. The test results show low heterogeneity so that they use fixed effect models in measuring the combined effect. The result obtained is OR = 7.33 with 95% confidence interval between 3.85 to 13.94. The combined effect also resulted in a Z value of 6.07 and a p value of 0.00001. Statistically, the combined effect was significant if the p value <0.05 and the confidence interval did not touch the vertical line. As produced by the funnel flot, the confidence interval value of the combined effect does not touch the vertical line. This means that the null hypothesis is rejected, in other words, there is a association between education and prevention of dengue hemorrhagic fever (DHF).

III. DISCUSSION

Association of Knowledge with Prevention of Dengue Hemorrhagic Fever (DHF) Behavior

Based on table 4.2 (total articles) and table 4.3 (significant articles) show the results of data analysis from 9 studies of the association between knowledge and prevention behavior of Dengue Hemorrhagic Fever (DHF) and analyzed using the Random Effect Model analysis model. The results of the heterogeneity test showed that the variation of the study was quite high heterogeneous, with p value = 0.01 andp=0.03 and the value of variation between studies (I2) was 59% and 58%, respectively.

The results of the data analysis displayed on the combined Forest Plot showed a association between knowledge and prevention behavior of Dengue Hemorrhagic Fever (DHF), after combined analysis, the results were related to the p value < 0.05, namely p 0.00001 and the pooled odds ratio value of 3.27 (95 %CI 1.99–5.36) and4.18 (95% CI 2.40–7.28), so it can be concluded that people who have good knowledge, 4.18 times will increase the prevention behavior of Dengue Hemorrhagic Fever (DHF) compared to those with less knowledge.

The results of this study indicate that people who have a good level of knowledge about dengue disease will increase their prevention behavior compared to people who have a poor level of knowledge. This study is in line with previous research which stated that there was a significant association between knowledge and DHF prevention behavior. The results of other studies also state that a good level of knowledge about DHF has a 3.5 times higher tendency to make efforts to prevent DHF compared to a poor level of knowledge. This is in line with the research found by researchers who show that the better the public's knowledge, the better the community's actions in preventing DHF. Improving knowledge and behavior of eradicating mosquito nests in the community is very important in efforts to control dengue vectors so that the number of dengue cases can be suppressed (Rusadi, 2020).

Based on the results of several studies, it can be concluded that knowledge is an important indicator in eradicating mosquito larvae as an effort to prevent dengue. Knowledge or cognitive is a very important domain in shaping a person's behavior (overt behavior). This is because behavior based on knowledge will be more lasting than behavior that is not based on knowledge. Therefore, knowledge is a very important domain for the formation of a person's actions in this case actions in handling dengue prevention efforts (Suoth, 2019).

Association between Education and Prevention of Dengue Hemorrhagic Fever (DHF)

Based on table 4.5 shows the results of data analysis from 3 research studies, the results of which state the association between education and Prevention of Dengue Hemorrhagic Fever (DHF) and analyzed using the Fixed Effect Model analysis model. The results of the heterogeneity test showed that the variation of the study was heterogeneous low, with a p value greater than 0.05 in the heterogeneity test, namely p = 0.34 and the value of variation between studies (I2) of 8%.

The results of the data analysis displayed on the combined Forest Plot showed that the results of the two studies showed a association between education and Dengue Hemorrhagic Fever (DHF) Prevention Behavior. the ratio of 7.33 (95% CI 3.85–1.94), so it can be concluded that people who have a good education, 7.33 times will increase dengue prevention behavior compared to those with less education.

Based on these data, it can be seen that the level of knowledge can affect a person's behavior towards the prevention of DHF. The result is p value < 0.05, namely p = 0.00001 and the pooled odds ratio value is 7.33 (95% CI 3.85–1.94). This result is in accordance with the research conducted by Putri (2016) which states that the level of education affects the community in carrying out preventive behavior (p = 0.003). The level of education also affects a person's knowledge, health knowledge will affect behavior as an intermediate impact of health education, then health behavior will affect the increase in public health indicators as the output of health education.

The results of this study are also in line with research conducted by Sari (2020) which states that there is a association between education and prevention of DHF at Puskesmas X Palembang in 2019. Education is an effort to develop personality and

abilities inside and outside school and lasts a lifetime. Education affects the learning process, the higher a person's education, the easier it is for that person to receive information. With higher education, a person will tend to get information, both from other people and from the mass media. The more information that comes in, the more knowledge you get about health. Knowledge is very closely related to education where it is expected that someone with higher education, then the person will be more knowledgeable in preventing dengue disease. However, it should be emphasized that a person with low education does not mean absolutely low knowledge (Rusadi, 2020).

Transmission of DHF cannot be separated from education and behavior as well as environmental conditions in which the community concerned lives. For example, education greatly influences a person in making decisions, an educated person when he encounters a problem will try to think as best he can in solving the problem. Availability of information is a medium for health education to convey health information. Availability of information is an enabling factor for the occurrence of a behavior. It is hoped that with the availability of information, awareness will increase and will have an impact on a positive attitude, so that there will be changes in DHF prevention behavior (Syahrias, 2018).

IV. CONCLUSION

Based on the results of the analysis and discussion, the following conclusions can be drawn:

1. There is a association between knowledge and prevention behavior of dengue hemorrhagic fever (DHF) through the analysis of 9 research studies that meet the requirements with a p value <0.05, namely p 0.00001 and a pooled odds ratio value of 3.27 (95% CI 1.99 - 5.36), so it can be concluded that high knowledge has 3.27 times increased prevention behavior of dengue hemorrhagic fever (DHF) compared to low knowledge.
2. There is a association between education and prevention behavior of dengue hemorrhagic fever (DHF) through the analysis of 3 research studies that meet the requirements with a p value < 0.05, namely p > 0.00001 and a pooled odds ratio value of 7.33 (95% CI 3.85 – 13.94), so it can be concluded that high education has 7.33 times increased prevention behavior of dengue hemorrhagic fever (DHF) compared to low education

REFERENCES

ADB, WHO (2013). Managing Regional Public Goods for Health: Community-Based *Dengue* Vector Control.

Ali, L. (2008). Kamus besar Bahasa Indonesia. Edisi Kedua. Depdikbud. Balai Pustaka. Jakarta.

Anwar, R. (2015). *Meta analisis*. Bandung.

Anwaruddin, (2010). Hubungan antara tingkat pendidikan dan jenis pekerjaan dengan partisipasi masyarakat dalam pembangunan di Desa Jetis Kecamatan Jaten Kabupaten Karanganyar. Universitas Sebelas Maret Surakarta.

Arikunto, & Suharsim,. (2012). Prosedur Penelitian Suatu Pendekatan Praktik. Jakarta : PT. Rineka Cipta.

Borenstein, M, Hedge, Larry V.S. Higgins, Julian, P. T. Hannah R. Rothstein (2009) *Introduction to Meta analisis*. United Kingdom: John Wiley & Sons, Ltd.

Christina, R., Suoth, Eva, M., Mantjoro, Jeini, E.N, (2019) Jurnal KESMAS, Vol. 8, No. 6, Oktober 2019 Halaman 499-505 Hubungan Pengetahuan dan Sikap Masyarakat Dengan Tindakan Pencegahan Demam Berdarah *Dengue* di Kelurahan Winangun I Kecamatan Malalayang

Cooke, A., Smith, D., & Booth, A. (2012). Beyond PICO: the SPIDER tool for qualitative evidence synthesis. *Qualitative health research*, *22*(10), 1435- 1443.

Depkes, RI (2011) Pemberantasan *Demam Berdarah Membutuhkan Komitmen Semua Pihak*, terdapat pada http://www.depkes.go.id/index.p hp/berita/press release/1547-pemberantasan- demam berdarah-membutuhkan komitmen semua pihak.html (diakses tanggal 20 Maret 2014. Jam 19.00 WIB).

Depkes, RI (2015) Data Dan Informasi Profil Kesehatan Indonesia Tahun 2015. Kementerian Kesehatan RI: Jakarta. http://www.depkes.go.id. di akses pada tanggal 23 Februari 2019.

Depkes, RI. (2011) *Indonesia Prakarsai Pengendalian DBD di Asean*, terdapat pada http://www.depkes.go.id/index.ph p/berita/press-release/1542- indonesia-prakarsai pengendalian-dbd-di-asean.html (diakses tanggal 20 Maret 2014. Jam 15.00 WIB).

Dwi, A N., Rico, J S, Heru, L. (2021) Faktor-Faktor yang Berhubungan dengan Pencegahan Demam Berdarah *Dengue* (DBD). Jurnal Ilmiah Universitas Batanghari Jambi, 21(1); 277-281.

Ernyasih, (2019) Jurnal Ilmu Kesehatan Masyarakat Vol. 08, No. 01 Hubungan Karakteristik Responden, Pengetahuan dan Sikap Kepala Keluarga terhadap Praktik Pencegahan Demam Berdarah *Dengue* (DBD)

Gibson, James, L., Ivancevich, John M., Donnelly Jr, James H., (1994). "Organisasi: Perilaku, Struktur, dan Proses", Edisi ke 5, Jilid 1, Penerbit Erlangga, PT. Glora Aksara Pratama, Jakarta

Ginanjar, G. (2008) Demam Berdarah. Yogyakarta. B-first.

Glasziou P, Mar CD, (2007) Salisbury J, Evidence-based practice workbook; Bridging the gap between health care research and practice. 2nd ed. Oxford: Blackwell Publishing. p.125-6.

Golubnitschaja *et al.*, (2012) Hierarki Evidence Based Medicine

Green, L. (1988) Health education planning a diagnostic approach, California, Mayfield Publishing Company

Hariastuti & Saman. (2007) Mengembangkan Kecerdasan Emosional Anak (on-line). Vol:8. No:1. 2007:101-110. dalam (http://intisari- online.com/read/ meningkatkan-kecerdasan- emosional- padaanak, diakses 4 April 2019).

Harisnal, (2019) Faktor-Faktor Yang Berhubungan Dengan Kejadian Demam Berdarah *Dengue* (DBD) Di Kelurahan Campago Ipuh Kota Bukittinggi Tahun 2018. Menara Ilmu 13(6); 80-88.
Hasan, S., Jamdar, S., Alalowi, M., & Ageel, A B. (2016). *Dengue* virus: A Global Human Threat. *Journal of International Society of Preventive and Community Dentistry*, *6*(1), 1. https://doi.org/10.4103/2231-0762.175416
Kabirul, B., Shohel, M., Asaduzzaman, Eilma AT, (2020). Afroza Bintey Zaman Knowledge and beliefs of the city dwellers regarding *Dengue* transmission and their relationship with prevention practices in Dhaka city, Bangladesh
Kemenkes, R I., (2017). Data Dan Informasi Profil Kesehatan Indonesia Tahun 2017. Kementerian Kesehatan RI: Jakarta. http://www.depkes.go.id. di akses pada tanggal 23 Februari 2019.
Kemenkes, R I., (2013). *Riset Kesehatan Dasar 2013*. Badan Penelitian dan Pengembangan Kesehatan. Jakarta.
Kemenkes, R.I., (2018). *Riset Kesehatan Dasar 2018*. Badan Penelitian dan Pengembangan Kesehatan. Jakarta.
Kitchenham, B., (2004). Procedures for Performing Systemic Reviews. Keele University Technical Report.
Lontoh, RY, Rattu, A.J.M, Wulan, P.J.K., (2016**).** Hubungan antara Pengetahuan dan Sikap dengan Tindakan Pencegahan Demam Berdarah (DBD) di Kelurahan Malalayang 2 Lingkunmargan III. PHARMACON Jurnal Ilmiah Farmasi UNSRAT 5(1); 382-389.
Mantra, I. (2009). *Demografi Umum*. Yogyakarta: Pustaka Pelajar Offset.
Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group, (2009) Diagram/ Bagan PRISMA
Mubarak, W. & Chayatin, N. (2009) *Ilmu Kesehatan Masyarakat Teori dan Aplikasi*. Jakarta. Salemba Medika.
Nina, S., Udin, R., Witdiawati, (2019). Pengetahuan dan Sikap Masyarakat dalam Pencegahan dan Pemberantasan Jentik Nyamuk Demam Berdarah *Dengue* (DBD) di Jayaraga Garut
Notoatmodjo, S., (2003). Konsep Perilaku Kesehatan, Teori dan Aplikasi. Fakultas Kesehatan Masyarakat UI. Jakarta.
Notoatmodjo, S., (2011). Kesehatan Masyarakat. Jakarta: Rineka Cipta
Notoatmodjo, S., (2012). *Metodologi Penelitian Kesehatan*. Rineka Cipta. Jakarta.
Notoatmodjo, S., (2014). Promosi Kesehatan dan Perilaku Kesehatan. Jakarta: Rineka Cipta.
Nur Aini. 2019. Hubungan Shift Kerja dengan Kelelahan Kerja pada Perawat di Instalasi Rawat Inap di Rumah Sakit Herna Medan Tahun 2018. Jurnal JUMANTIK. 4(1): 45- 56.
Nursalam, (2014). Konsep dan penerapan metedologi penellitian illmu keperawatan. Jakarta: Salemba.
Pantouw, R.G. *(*2016) Hubungan Pengetahuan Dan Sikap Masyarakat Dengan Tindakan Pencegahan Penyakit Demam Berdarah *Dengue* Di Kelurahan Tuminting. Jurnal Kedokteran Komunitas dan Tropik 4(4); 1-10.
Perry, A, & Hammond, N. (2002). S*ystematic Review*: The Experience of a PhD Student. Psychology Learning and Teaching, 2(1): 32–35.
Prasetyo, S., (2007). Metode Penelitian Kuantitatif: Teori dan Aplikasi. Jakarta: Raja Gradinda.
Putri, R., & Zaira, N. (2016). Hubungan Tingkat Pendidikan dan Pengetahuan Masyarakat dengan Perilaku Pencegahan Demam Berdarah *Dengue* di Desa Kemiri, Kecamatan Jayakerta, Karawang. Jurnal Berkala Ilmiah Kedokteran 1(4); 1-10.
Retnawati, H., Apino, E., Kartianom, K., Djidu, H., & Anazifa, R. D. (2018). Pengantar Analisis Meta, Yogyakarta: Parama Publishing.
Rusadi, N, & Gandha, S. P. (2020). Determinan Perilaku Pencegahan DBD Di Kelurahan Kapuas Kanan Hulu Kabupaten Sintang. Jurnal Kesehatan Masyarakat Khatulistiwa 7(4); 190-201.
Sari, D.E., (2019.) Pengetahuan, Sikap dan Pendidikan dengan Pencegahan Demam Berdarah *Dengue* Menggunakan Prinsip Menguras, Menutup dan Memanfaatkan Kembali. Jurnal Ilmiah STIKES Citra Delima Bangka Belitung 3(2); 163-170.
Sastroasmoro, S,. (2011). *Meta analisis dalam Dasar-Dasar Metodologi Penelitian Klinis*. Sudigdo Sastroasmoro dan Sofyan Ismael (Editor). Edisi ke-4. Jakarta. Sagung Seto.
Siangler. et.al., (2011) Epidemiological Characteristics of the 2005 and 2007 *Dengue* Epidemics in Singapore – Similarities and Distinctions. WHO (internet). Dari URL www.who.int
Siswanto, (2010). Systematic Review Sebagai Metode Penelitian Untuk Mensintesis Hasil- asil Penelitian (Sebuah Pengantar). Buletin Penelitian Sistem Kesehatan. 13 (4) :330-332.
Sriawan, & Utami, N.S., (2015.) Pemetaan Penelitian Mahasiswa Program Studi Pendidikan Guru Sekolah Dasar Pendidikan Jasmani Tahun 2013-2015. *Jurnal Pendidikan Jasmani Indonesia*, *11*(November), 82–87.
Subadi W. (2017) Hubungan Faktor Lingkungan Sosial (Pengetahuan, Sikap, Dan Perilaku) Terhadap Kejadian Demam Berdarah *Dengue* Di Kelurahan Sorosutan Kota Yogyakarta Tahun 2013. Jurnal Ilmu Administrasi Publik & Bisnis 1(1); 173-183.
Sugiyono, (2014). Metode Penelitian Bisnis. Bandung: CV. Alfabeta: Bandung
Sugiyono. (2010). Metode Penelitian Kuantitatif, Kualitatif dan R&D. Edisi Kedua. Bandung: Alfabeta.
Suhendro, Nainggolan, L, Chen, K., & Pohan, H., (2010). Demam Berdarah *Dengue*. In: Sudoyo AW, Setiyohadi B, Alwi I, et al. Buku Ajar Ilmu Penyakit Dalam Edisi 5 Jilid III. Jakarta. Interna Publising.
Sungkar, S., Winita, R., Kurniawan & Agnes, (2010). Pengaruh penyuluhan terhadap tingkat pengetahuan masyarakat dan kepadatan *Aedes aegypti* di kecamatan bayah, provinsi banten", Jurnal Kesehatan, vol 14, No. 2 (hlm 81-85)
Suoth, CR, Eva, M.M, Jeini E,N. (2019). Hubungan Pengetahuan dan Sikap Masyarakat dengan Tindakan Pencegahan Demam Berdarah *Dengue* di Kelurahan Winangun I Kecamatan Malalayang. Jurnal KESMAS 8(6); 1-10.
Syahrias, L. (2018). Faktor Perilaku Pencegahan Demam Berdarah *Dengue* (DBD) di Kelurahan Mangsang, Kota Batam. Jurnal Dunia Kesmas 7(3); 134-141.
Taniredja, et. Al, (2012). Model-Model Pembelajaran Inovatif. Bandung: Alfabeta

Triyani, (2010). Waspada Penyakit Demam Berdarah. Nobel Edumedia. Jakarta.
Utomo & Tri, W., (2016). *Meta analisis* Dalam Study Kebijakan. Printout Power Point disajikan dalam forum Penguatan Kelembagaan Pusat Data dan Informasi Penelitian Hukum dan HAM, Jakarta.
WHO, (2016). The *Dengue* Strategic Plan For The Asia Pasific Region 2008-2015. Diunduh dari: http://www.searo.who.int/entity/vector_borne_tropical_diseases/ documents/WP- DP8-15/en/
WHO. (2019). Update On the *Dengue* Situation in the Western Pacific Region. http://www.who.int. di akses pada tanggal 1 Maret 2019.
Widyatama, E.F. (2017). Faktor yang Berpengaruh Terhadap Kejadian Demam Berdarah *Dengue* Daerah Endemis di Wilayah Kerja Puskesmas Pare Kecamatan Pare Kabupaten Kediri. Skripsi. Surabaya: Fakultas Kesehatan Masyarakat Universitas Airlangga