Health Literacy and Early Detection Skills of Dengue Hemorrhagic Fever in Adolescents

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ABSTRACT

Dengue hemorrhagic fever (DHF) is a significant public health problem in Indonesia, especially in tropical areas such as Jepara Regency. The increase in DHF cases in adolescents is caused by low health literacy and a lack of confidence in early detection skills that play an important role in preventing DHF. The impact is the occurrence of complications to the economic impact of the community in the treatment phase. This study aims to analyze the relationship between health literacy with early detection skills for DHF in adolescents. This study aims to analyze the relationship between health literacy and health beliefs with early detection skills of DHF in adolescent groups at SMAN 1 Tahunan, Jepara Regency. This study used a correlational analytical design with a cross-sectional approach. Independent variables are health literacy Dependent variables are early detection skills of DHF. This study was conducted in November at SMAN 1 Tahunan, the number of samples was 93 students selected using purposive sampling techniques. The research instrument used health literacy instruments (HLS-12Q),), and early detection behavioral skills of DHF. Data analysis was carried out using the chi-square test. The results of the study showed that there was a significant relationship between health literacy and early detection skills of DHF with a p-value = 0.000, health literacy is related to early detection skills. With this, schools and health centers can collaborate in improve health literacy, skills and early detection of DHF.

Keywords: adolescents, dengue hemorrhagic fever, early detection skills, health literacy

INTRODUCTION

Dengue hemorrhagic fever (DHF) is still one of the main public health problems in Indonesia. The number of cases and areas where DHF is spread is increasing with population density, especially in areas of Indonesia with sub-tropical and tropical climates. High rainfall, as well as hot and humid temperatures, are a place for mosquitoes Aedes Aegypty mosquito (Kementerian Kesehatan RI, 2022), This disease can cause serious symptoms and even death if detected too late. Early detection is very important in treating DHF because it allows for quicker and more precise medical intervention (Aryawati et al., 2022). The clinical manifestations of DHF begin with a high fever, lasting 5 to 7 days until symptoms indicate bleeding that can threaten life (Linardi et al., 2021). Based on this phenomenon, DHF is found throughout the world with various problems that arise.

According to the World Health Organization (WHO, 2024) the number of global dengue cases in 2024 will reach more than 7.6 million, including 3.4 million confirmed cases, 16,000 severe

cases, and more than 3,000 deaths in 2022 there were 143,266 recorded with 1,237 deaths, this is an increase from 73,518 cases and 705 deaths in 2021. In 2023, there will be a decrease to 114,720 cases with 894 deaths (Kementerian Kesehatan RI, 2022). In Central Java, DHF cases increased from 4,470 in 2021 to 12,994 in 2022, with a Case Fatality Rate (CFR) of 2.15 percent. In 2023 it will be 2.0 percent an increase in cases was also found in several districts (Dinkes Jateng, 2023).

Jepara Regency, which consists of coastal and lowland areas, is an endemic area for DHF. In 2022, DHF is still a serious problem, with cases increasing from 95 in 2021 to 217 cases in 2022, including three deaths. In 2023, the number of cases decreased to 124. The health centers with the highest number of cases in 2022 were Pecangaan (33 cases), Kalinyamatan (28 cases), Mayong II (21 cases), and Tahunan (23 cases) (Dinkes Kab. Jepara, 2022). However, in 2024 there will be an increase in cases to 358 in Jepara. Tahunan District, as of June 2024, recorded 65 cases of DHF, especially among those aged 5-20 years. Environmental factors, such as the habit of throwing rubbish carelessly, and education levels, most of which only reach senior high school. Various internal and external factors cause the increase in the number of cases.

Dengue hemorrhagic fever is caused by the dengue virus which is transmitted through mosquitoes Aedes aegypti and Aedes albopictus which is a health problem. This causes clinical signs and symptoms including skin rashes, muscle and joint pain, and hyperthermia. The success of DHF management is determined by adolescents' behavioral skills in early detection of the critical phase and signs of DHF symptoms so that they receive fast and appropriate treatment (Linardi et al., 2021). Based on this, the lack of skills in early detection of DHF triggers various impacts experienced by the community.

The impact of DHF on society occurs because a lack of understanding and inadequate treatment phase increases the risk of DHF. This disease can attack all age groups, but the most vulnerable are children and young adults. Lack of education and early detection skills are the main causes (Apriliya et al., 2024). This causes complications of dengue shock syndrome, which include fragility of blood vessels, and increased plasma leakage. As many as 1 to 20% of dengue viruses develop serious life-threatening disease. Apart from that, DHF has an impact on the community's economy during the treatment phase (Tansil et al., 2021). These various impacts arise due to the community's lack of early detection skills in recognizing the signs and symptoms of disease. Most people assume that DHF is the same as ordinary fever. Several previous studies support this. Research Linardi et al. (2021) shows that successful early detection of disease depends on the ability to recognize symptoms, especially in the critical

phase, which allows rapid treatment (Chanpen et al., 2022) emphasizes the importance of sustained prevention to control DHF with good results. Health literacy plays a role in shaping behavior that influences early disease detection.

Based on a preliminary study conducted in the Tahunan District in July 2024, through interviews with teachers, as many as ten students experienced DHF, so they needed to be hospitalized at a health service facility. As a result of interviews, six students said that they did not understand the differences between the signs and symptoms of DHF and ordinary fever. A total of 4 teachers have been screeed for DHF at health service facilities. Based on this phenomenon, it can be concluded that teenagers' early detection skills, literacy, and confidence in dealing with health problems, especially DHF, are still lacking.

According to the research results of Anggraini et al. (2023) research in Sendangmulyo Village, Semarang, which involved 26 respondents. Providing education about dengue hemorrhagic fever (DBD) literacy has succeeded in increasing knowledge and attitudes towards dengue prevention and statistical analysis shows a significant increase in knowledge and attitudes with significantly different pretest and posttest. This research, is in line with research by Chanpen et al. (2022) found that there was a significant relationship between health literacy and prevention of early detection of DHF. Most respondents with good health literacy tend to behave well in preventing and detecting signs of DHF.

Meanwhile, Amanda et al. (2023) results in mothers' knowledge and behavior regarding early detection of dengue hemorrhagic fever in children. The study showed that 52.8% of mothers had good knowledge about early detection of DHF in children, while 94.4% showed good behavior in early detection. Statistical tests revealed a significant relationship between maternal knowledge and early dengue detection behavior, where more knowledgeable mothers tended to be better at detecting early symptoms of DHF in children.

It is stated that there is no dominant factor that influences the prevention and detection of DHF. Anggraini et al. (2023) implemented a community service method using random sampling techniques, and the research results showed that health literacy education about DHF significantly increased knowledge and prevention attitudes among 26 respondents. Chanpen et al. (2022) uses a cross-sectional approach with purposive sampling involving 410 people in the Min Buri district, Bangkok, which revealed that a high level of health literacy was well associated with early dengue prevention behavior. The level of knowledge of signs and symptoms influences individual actions. Moreover, age, work, and education influence

community behavior in DHF. Amanda et al. (2023) used a cross-sectional approach with total sampling, involving 36 mother respondents at Posyandu Flamboyan 2, and found that 52.8% of mothers had good knowledge about early detection. DHF, while 94.4% showed good behavior in detecting early symptoms of the disease. A high level of education or group experience results in good DHF prevention to skills, However, this research only focuses on the adult age of homemakers whose level of knowledge and experience.

The research above was carried out in different places, conditions and targets, types of research, and sampling techniques. Hence, the researchers specifically wanted to know whether health literacy influenced early dengue detection skills in the group of teenagers at Senior High School 1 Tahunan by using techniques of purposive sampling and the sample used was teenage students by looking at health literacy in early detection of DHF in teenagers, making the younger generation active in health and reducing the number of dengue cases. It is hoped that this research will be useful in the field of nursing, enriching nurses' knowledge about topic phenomena and developing therapeutic communication techniques, so that the role of nurses as educators and researchers can provide education on the prevention of signs and symptoms of early detection of DHF and see the relationship between health literacy. The study aimed to analyze the relationship between health literacy with early detection skills for DHF in adolescents.

METHODS

Study Design, Samples, and Setting

Correlational analytical research design with approaches cross-sectional The independent research variable is health literacy, and the dependent variable is DHF early detection skills. The inclusion criteria for this research are students registered as active students at Senior High School 1 Tahunan, students having students' number, students participating in the research process, and the exclusion criteria for students having permission, illness, or not being at the research location for certain reasons. The location at Senior High School 1 Tahunan, with a sample size of 93 students using a sampling technique, purposive sampling.

Instruments

In this research, a questionnaire measuring instrument with a measuring scale was used like, questionnaire HLS12Q, to obtain health literacy data, this questionnaire contains 12 statements that have been tested for validity > 0.400 and reliability Cronbach alfa 0.870 in research

conducted (Zanini et al., 2023) and the DHF early detection skills questionnaire sheet contains 22 statements. This questionnaire has been tested for validity > 0.361 and reliability Cronbach alfa 0.761 in research (Amanda et al., 2023).

Data Collection

The first research procedure is that the researcher asks for a research certificate from an educational institution, namely Muhammadiyah Kudus University, and the one-stop-shop investment and integrated services service at Jepara and continues to the office. Jepara District Health approached the respondents, and then the researchers chose the criteria for respondents, Those selected were asked to fill out and sign a letter of consent to become respondents. The two researchers distributed questionnaires to be filled in completely. After the questionnaires were filled in out completely, the researchers re-examined the completeness of all respondents who filled them out. Then, when the questionnaire is complete and there are no blanks, the researcher processes the data obtained with the help of a computer program.

Ethical Consideration

This research has been declared to have passed a research ethics review from the health research ethics commission of Muhammadiyah University of Kudus with number (57/Z-7/KEPK/UMKU/IX/2024) because it was deemed not to cause dangerous conditions for respondents and was in accordance with existing standards.

RESULTS

Respondent Characteristics

Table 1. Distribution of Student Characteristics at Senior High School 1 Tahunan

Characteristics	f	%	Mean	SD
Age (years)			16,29	0,685
Gender				
Man	39	41,9	-	-
Woman	54	58,1	-	-
History of DHF				
Once	29	31,2	-	-
Never	64	68,8	-	-

Table 1 shows that the average age of students is 16.29 years, with an SD of 0.685. Most of the students were female, namely 54 students (58.1%). Most of the students had a history of DHF, namely 64 students (68.8%).

Students' Health Literacy

Table 2. Frequency Distribution of Students' Health Literacy at Senior High School 1 Tahunan

Health Literacy	Frequency (f)	Percentage (%)
High	26	28,0
Enough	35	37,6
Low	32	34,4

Table 2 shows that almost half of the students have sufficient health literacy, namely 35 students (37.6%), have sufficient health literacy.

Early Detections Skills

Table 3. Frequency Distribution of DHF Early Detection Skills of Students Senior High School 1 Tahunan

Early detection skills of DHF	Frequency (f)	Percentage (%)
Good	34	36,6
Enough	29	31,2
Not good	30	32,3

Table 4 shows that almost half of the students have early detection skills for DHF in the high category, namely 34 students (36.6%).

Relationship between Health Literacy and DHF Early Detection

Table 5. Relationship between Health Literacy and DHF Early Detection Skills in Adolescent

Health Literacy	Early Detection Skills of DHF						Total		p-value
	Good	%	Enough	%	Not good	%	f	%	
High	21	80,8	4	15,4	1	3,8	26	100	
Enough	9	25,7	11	31,4	15	42,9	35	100	0,000
Low	4	12,5	14	43,8	14	43,8	32	100	
Total							**93**	**100**	

Table 5 explains the distribution of data between 2 variables, namely health literacy and DHF early detection skills among students, showing that almost all students with high levels of health literacy have DHF early detection skills. The good ones are 21 students with results carried out using the chi-square test getting a p-value of 0.000 (<0.05), then Ho is rejected, which means there is a significant relationship between health literacy and DHF early detection skills in the group of adolescent students.

DISCUSSION

Gender

In this study, the majority of students were mostly women. The results of this research are in line with previous research which states that the majority of high school students are female students (Pratiwi et al., 2019) and the majority of public and private high school students female students (Roiefah et al., 2021). Referring to basic national education data, the percentage of students at the high school level is female (Kemendikbud, 2024). This is due to a significant increase in the growth rate of the female population. So, the female population dominates almost all areas. Based on this, it can be concluded that there are more female students than male students.

Age

In this study, the majority of students were 16 years old. This is in line with previous research stating that the majority of high school teenagers are aged 17-21 years (Azizah et al., 2023). The other reserach states that almost half of public and private high school students are 16 years old (Roiefah et al., 2021). Referring to data from the Jepara District Central Statistics Agency, the age percentage of students in at the secondary level, almost all of them are aged 15-19 years 92.8%, at this age, the majority of students undertake school activities 69.1% (Badan Pusat Statistik Jepara, 2023). This reflects the educational trend in Indonesia where at the age of 16 years becomes the middle school phase so that teenagers preparing for national and world higher education exams. Based on this, it can be concluded that the majority of students aged 16 years attend secondary school.

History of DHF

In this study, the majority of students had never experienced DHF. This study is in line with previous research showing that the majority of teenagers do not experience DHF as many as 73% (Baitanu et al., 2022). The other research showing that almost all respondents do not experience DHF as many as 87% (Panungkelan et al., 2024). This can be seen from the transmission of DHF, including environmental factors, attitudes, and location of residence. Adolescents have high immunity, if adolescent health awareness is low, the incidence of DHF increases (Purnama & Yulistiani, 2022). The number of cases of DHF, most of the data is not shared thoroughly. Even though the incidence of DHF is low, environmental factors and awareness dominate the transmission of DHF. It can be concluded that the incidence of DHF

in adolescents is influenced by awareness, attitudes, and location of residence. Teenagers who have high levels immunity and awareness can prevent the occurrence of DHF.

Health Literacy

The research results show that almost half of the students have moderate health literacy. This research is in line with research Chanpen et al. (2022) showing that almost half of the respondents have moderate health literacy as many as 32.2%. Similar results were also found in research Anggraini et al. (2023) used health education and gave a pretest and posttest to 23 housewife respondents. It was found that the majority of health literacy was in the high category, after being given health education. Health literacy is an individual's ability to access, understand, and use health information in making appropriate health decisions. High health literacy can encourage a group's ability to recognize early signs of disease and anticipate them early (Nutbeam & Lloyd, 2021). This condition is very important in prevention, good understanding, ways of preventing and controlling the disease can contribute to reducing the incidence of DHF (Poum, 2024).

Factors that influence health literacy are economic status, level of education, and employment. However, for adolescents, access to health information, the environment, social support, and adolescent experiences, including health education received at school, play a role in increasing high levels of health literacy. If teenagers have good abilities in managing disease, they will be more likely to use health services (Nutbeam & Lloyd, 2021). The group of young students who experience health literacy are more interested in how to receive information, with online media so that students understand more, which makes students' health literacy levels sufficient, teenagers' habits in finding information are lacking and managing the disease. There is a need for health education or community movements on a scale so that they will be facilitated so that adolescent health literacy increases (Roiefah et al., 2021).

This is because the majority of teenagers tend to be more interested in receiving health information via online electronic media. So, it shows that their habits in seeking health information could be more optimal, which can have an impact on the level of adolescent health literacy. Based on the research results, it can be concluded that the teenage student group is more interested in accessing health information using online media such as health websites, thereby creating sufficient health literacy, and the habit of lacking access to health information results in low health literacy.

Early Detection Skills

The results of this study show that almost half of the students have good early detection skills for DHF. This research is in line with previous research showing that the majority of respondents experienced good DHF early detection skills behavior, 52.8% (Amanda et al., 2023). This is in line with research conducted by (Sulistiyanto et al., 2023), which also obtained the same results, namely that the majority of respondents had early disease detection skills in the good category, 52.9%.

Early detection skills are identifying early signs of community problems with a disease. Factors that influence early detection skills are level of education, experience, age, and occupation. (Notoatmodjo, 2014). Good early detection skills describe individuals who have a high level of health information, have a history of previous dengue cases, and even experience managing dengue cases. Other factors that can influence early detection skills are the level of health literacy and self-efficacy (Aryawati et al., 2022). This can influence people's attitudes and behavior in early detection, high self-confidence in preventing early disease and level of education can certainly influence good early detection skills (Amanda et al., 2023).

The level of health knowledge and confidence is also an influential factor that makes early detection skills for DHF or other diseases in the low to high category (Baitanu et al., 2022). Good early detection behavior in adolescent students results in the development of developing health information. Teenagers and adults prefer simple things rather than having to queue at the nearest health service center. The development of a health information system means that the public can consult a doctor, transact medicines, and even provide health education in the event of an outbreak such as DHF and COVID-19 (Ridwan et al., 2020). This is because the majority of teenagers have a high level of health knowledge and good access to information, which creates a level of confidence in taking preventive measures. The many conveniences of digital systems have led to increased early detection skills. Tends to be good.

The Relationship between Health Literacy and Early Detection Skills for DHF in Adolescent

The results of the research show that there is a relationship between health literacy and early detection skills. This research is in line with research (Chanpen et al., 2022). Which shows that there was a significant relationship between health literacy and early DHF detection skills. Research conducted Poum (2024) also stated that the majority of respondents with health literacy were in the high category, 172 respondents (80%), with early DHF detection behavior

in the majority of society being in the high category, 175 respondents (81.40%). In research conducted by (Nurfitri, 2022), it was stated that the majority of respondents had good levels of early detection practices (72.3%), and the majority of respondents had high health literacy (68.4). Which shows positive results and a contribution to health literacy and early detection measures. In research conducted by Putri and Anshari (2019), it was stated that the majority of female students had high health literacy (65%). Health literacy with the practice of early detection of breast cancer found that female students who had high health literacy had 17 times greater chances of practicing BSE than those who had low health literacy.

Research conducted Rodiyah et al. (2023) shows that the majority of cadres have a health literacy level of 55% in efforts to prevent and detect stunting. However, the health literacy of high school-educated cadres needs to be improved, especially in the behavior of early detection of stunting incidents. This is due to the obstacles faced by cadres, namely that the majority feel a need for more confidence, 68% in their literacy. Apart from that, the need for more of technology is an obstacle in to doing so health education. Most cadres carry out outreach at 63% and are less active in publishing health information on social media at 59%. In this research, it is hoped that cadres can improve health literacy and skills in the early detection of stunting.

One of the cause of the group is a lack of prevention and early detection behavior, one of which is caused by health literacy, education level, and group experience. Early detection skills can be influenced by a person's activities/experience in preventing disease. The higher a person's experience and health literacy, the better the quality of prevention and early detection behavior of a disease (Rodiyah et al., 2023). Health literacy can improve patient service and responsibility as well as access to information and health services. Individuals who have high health literacy have been proven to be able to improve the level of public health. In practice, high health literacy has 3 times greater self-efficacy for early disease detection compared to low health literacy. Apart from low health literacy, efforts need to be made to increase the public's awareness of health information effectively (Putri & Anshari, 2019).

Based on the research results, it was concluded that increasing good health literacy was able to influence groups of teenagers in terms of early DHF detection skills. The higher the adolescent health literacy and experience, the better the early detection skills for DHF. Likewise, if teenagers have low levels of health literacy, the result is that their early detection skills for DHF are poor. Efforts need to be made to increase health literacy so as to reduce the increase in the incidence of DHF.

CONCLUSION

Health literacy has a significant relationship with early detection skills for DHF. The results of the research are a reference source in developing innovative nursing interventions to improve health literacy, health confidence and adolescent skills in carrying out early detection of dengue hemorrhagic fever. Future research can identify other factors related to early detection skills for dengue hemorrhagic fever such as perception, self-confidence, health-seeking behavior, attitude, preparedness, etc.

LIMITATION

This research has limitations, the time required to collect data is longer than the initial plan. Many students are absent, so the researcher needs a long time to meet the expected respondents, A small number of students need help understanding what is stated in the questionnaire. So, the researcher has to explain again, even though the questionnaire has been tested for validity and reliability.

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