



Health Beliefs and Skills for Early Detection of Dengue Hemorrhagic Fever in Adolescents

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Abstract

Dengue hemorrhagic fever (DHF) is a public health threat, especially in tropical countries like Indonesia. The increase in morbidity and mortality rates due to dengue fever, especially in the adolescent group, indicates that this problem needs more attention. This is due to a lack of health confidence and early detection skills for dengue fever. Teenagers, families, communities, and even countries feel the burden of disease. The research aims to analyze the relationship between health beliefs and early dengue detection skills in adolescents. The research design uses correlation analysis with a cross-sectional approach. Variable independent, namely health beliefs, and variable dependent, namely early detection of dengue fever skills. The research was conducted at a senior high school in Jepara Regency in January 2025. The research sample was 93 adolescents selected using a purposive sampling technique based on criteria. Data analysis used the chi-square test. The results of the study showed that there was a statistically significant relationship between health beliefs in the dimensions of perceived vulnerability ($p=0.048$), perceived severity ($p=0.025$), perceived benefits ($p=0.028$), cues to action ($p=0.020$), and self-efficacy ($p=0.002$). However, there was no statistically significant relationship on the dimension of perceived barriers ($p=0.467$). Most dimensions of health beliefs were significantly associated with the behavior. Interestingly, perceived barriers showed no significant relationship. This may suggest that barriers were either not relevant in this context or had already been addressed by the participants. There needs to be making efforts to increase health confidence and early dengue detection skills in adolescents.

Keywords: Adolescents, Dengue Hemorrhagic Fever, Early Detection, Health Beliefs, Skills.

INTRODUCTION

Dengue hemorrhagic fever (DHF) is still one of the leading public health problems in Indonesia. The number of cases and areas of dengue fever is increasing with population density, especially in areas of Indonesia with subtropical and tropical climates. High rainfall and hot and humid temperatures are places where the *Aedes Aegypti* mosquito lives and breeds (RI Ministry of Health, 2022). This disease can cause severe symptoms and even death if detected and treated too late. Early detection is critical in treating dengue fever because it allows clients to receive medical intervention more quickly and precisely (Aryawati et al., 2022). Clinical manifestations of dengue fever begin with a high fever, lasting 5 to 7 days until symptoms indicate bleeding that can be life-threatening. (Linardi et al., 2021). The burden of disease is felt by clients, families, communities, and even countries. Clients will experience a decline in their health condition and even the threat of death if they do not receive proper treatment. Families who care for clients are required to be able to provide the best care so that disease complications and even death do not occur. The local community is at risk of contracting dengue fever, causing a pandemic in certain areas. The state must finance client care while being



treated in health service facilities. Due to this phenomenon, dengue fever is found worldwide, and various problems arise. This is also characterized by increasing morbidity and mortality rates due to dengue fever.

According to the World Health Organization (WHO), 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. (World Health Organization, 2024). In Indonesia, dengue fever cases in 2022 were recorded at 143,266 cases with 1,237 deaths, which has increased from 73,518 cases to 705 deaths in 2021. In 2023, there will be a decrease to 114,720 cases with 894 deaths. (RI Ministry of Health, 2022). In Central Java, dengue fever cases increased from 4,470 cases in 2021 to 12,994 in 2022, with a Case Fatality Rate (CFR) of 2.15%. 2023, it will be 2% (Central Java Health Office, 2023). Jepara Regency, which consists of coastal and lowland areas, is an endemic area for dengue fever. In 2022, dengue fever will still be a serious problem, with an increase in prevalence from 95 cases in 2021 to 217 cases in 2022, including three deaths. In 2023, the prevalence will decrease to 124 cases. The health centres with the highest cases in 2022 are Pecangaan (33 cases), Kalinyamatan (28 cases), Mayong II (21 cases), and Tahunan (23 cases) (Jepara District Health Office, 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 dengue fever, especially among those aged 5-20 years.

DHF is caused by the dengue virus transmitted by the *Aedes aegypti* and *Aedes albopictus* mosquitoes, characterized by skin rashes, muscle and joint pain, and even hyperthermia. Environmental factors, such as the habit of littering and low levels of education characterized by a lack of health literacy, are the causes of increasing the number of dengue fever cases in various regions. The success of dengue fever management is determined by the adolescent's behavioural skills in early detection of the critical phase and the signs of dengue fever symptoms so that they receive quick and appropriate treatment. (Linardi et al., 2021). Based on this, the lack of early detection skills for dengue fever triggers various impacts experienced by the community. The impact of dengue fever on society occurs because a lack of understanding and skills in treating the disease triggers an increased risk of dengue fever. 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 leading causes (Apriliya et al., 2024). This causes complications of dengue shock syndrome, which include blood vessel damage and increased plasma leakage.

As many as 1-20% of dengue viruses develop into life-threatening diseases. Dengue fever also impacts 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 dengue fever is the same as ordinary fever. Several previous studies support this. A study (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. According to Rosenstock (1974), individuals have an assessment of susceptibility and severity that drives disease prevention actions. A health belief approach is needed to assess early dengue detection measures. Lack of health beliefs affects the group's skills in detecting health problems. (Surahmawati et al., 2019).

A preliminary study conducted at a state high school in Tahunan District, Jepara Regency, found that 10 adolescents had dengue fever and needed to be hospitalized in a health service facility. A total of 6 adolescents said that they did not understand the differences between the signs and symptoms of dengue fever and ordinary fever. At health service facilities, as many as four teachers have been screened for dengue fever. Based on this phenomenon, it can be concluded that teenagers' early detection skills, literacy, and confidence in dealing with health problems, especially dengue fever, are still lacking. Based on research conducted by Surahmawati et al. (2019) Regarding the health beliefs of dengue fever clients in the Mamajang Community Health Center working area, Makassar City shows that 78% of dengue fever patients feel vulnerable to this disease, while 22% do not feel vulnerable. All respondents acknowledged the importance of preventative measures, such as maintaining a clean environment and regularly draining bathtubs. However, concerns about the addictive substances in mosquito repellent are a significant obstacle. Self-confidence in preventive measures plays an important role in shaping patient health behaviour.

According to the results of research conducted by Gusni Febriasari and Endang Kusumawardhani (2019) regarding the beliefs and skills of dengue hemorrhagic fever prevention among homemakers, homemakers have different perceptions of dengue prevention. Some mothers do not understand dengue prevention, as seen by their habit

of not regularly cleaning the environment. The main obstacle is the difficulty of keeping the house clean, especially for mothers with children aged 5-12 years, which causes the perception of the benefits of prevention to be lower than the barriers. Researchers used the Health Belief Model (HBM) approach through questionnaires and health education about breast cancer for 3 months. The results showed a significant increase in health knowledge and perception from 29% to 79% ($p < 0.001$). These results show that health beliefs do not always depend on the level of education but are also influenced by experience and cues to action. This research emphasizes the importance of effective health education to improve public health beliefs, encouraging individuals to take preventive measures despite their varied educational backgrounds.

Based on these three studies, it is stated that no dominant factor influences the prevention and detection of dengue fever. Surahmawati et al. (2019) conducted qualitative research using purposive sampling techniques. They found that respondents' perceptions of confidence regarding early detection of dengue hemorrhagic fever (DHF) were greatly influenced by the individual's level of education and experience. Research conducted by Gusni Febriasari and Endang Kusumawardhani (2019), who also used a qualitative approach and thematic analysis with purposive sampling techniques, explained that homemakers' perceptions and beliefs regarding dengue prevention depended greatly on their level of education. Many mothers experience difficulty implementing preventive behaviour, especially those with children aged 5-12 years. Another research study was conducted by Masoudiyekta et al. (2018) using random sampling techniques on 15 respondents. The research showed that most respondents worked as housewives and had diplomas. This study used the Health Belief Model questionnaire and health education about breast cancer. Revealed health beliefs do not always depend on the level of education, but are influenced by experience, cues to action, and a person's level of perceived confidence in managing disease and early health screening.

Early research was carried out in different location settings, targets, and methods. The research results are also described in several health belief domains. They are hoped to become basic data for nurses in developing independent nursing interventions through promotive and preventive efforts for dengue fever among adolescents and the community. Independent nursing intervention increases the nurse's identity as a professional health worker integrated into nursing care. The research results improve nursing science through scientific, evidence-based nursing practice. Nurses act as caregivers, educators, researchers, and collaborators in this research. Nurses provide nursing care to adolescents as clients. Nurses provide health education about early detection of dengue fever as an effort to spread the disease among teenagers, especially in school settings. Nurses research factors related to early dengue detection skills in adolescents, especially self-confidence. Nurses collaborate with schools to improve health literacy, health beliefs, and early dengue detection skills in adolescents. This research analyzes the relationship between health beliefs and early dengue detection skills in adolescents.

METHODS

The research design uses correlational analytics with a cross-sectional approach. The independent variable is health confidence, and the dependent variable is early dengue detection skills in adolescents. This research was conducted at a state high school in Tahunan District, Jepara Regency, as one of the dengue fever loci in Jepara Regency in January 2025. The research sample consisted of 93 adolescents, determined using Slovin's formula based on the total population that met the inclusion and exclusion criteria. A purposive sampling technique was then applied to select participants who were relevant to the study objectives. Inclusion criteria are being registered as an active student at school, having a student identification number, and participating in the entire research process from start to finish. The exclusion criteria are that adolescents are not at the research location for specific reasons. The research instrument used the Health Belief Model Questionnaire (HBMQ) consisting of 22 question items with answer choices strongly agree (5), agree (4), neutral (3), disagree (2), and strongly disagree (1). Interpretation of results consists of high (score > 80), fair (51-80), and low (< 51) (Kueh et al., 2022). Researchers conducted validity and reliability tests on 30 adolescents at a state Islamic high school in Jepara Regency, which had the same characteristics as the research location. The validity value is 0.481, and the reliability value is 0.769. The DHF early detection skills questionnaire consists of 22 statement items with answer choices of strongly agree (5), agree (4), neutral (3), disagree (2), and strongly disagree (1) with a reliability value of 0.761 (Amanda et al., 2023).

Researchers provide research explanations to potential respondents, including the title, objectives, benefits, procedures, rights, and obligations of respondents. Researchers provide opportunities to potential respondents about the research that will be carried out. Respondents fill out a consent form if they are willing to follow the research process from start to finish. Respondents completed a questionnaire on health beliefs and early detection skills for dengue fever. Researchers checked the completeness of the questionnaire before analyzing it. Data analysis was conducted using the chi-square test to examine the relationship between health belief dimensions and dengue early detection skills. The chi-square test was chosen because the variables were categorical in nature. Statistical significance was set at $p < 0.05$. This research has been declared to have passed a research ethics review from the health research ethics commission of Muhammadiyah University of Kudus with a number (57/Z-7/KEPK/UMKU/IX/2024) because it was deemed not to cause dangerous conditions for respondents and was by existing standards.

RESULTS

Table 1 shows that the average age of adolescents is 16.29 years, with an SD of 0.685. Most of the adolescents were female, namely, 54 adolescents (58.1%), and 68.8% adolescents never had a history of dengue fever. Table 2 shows that The majority of adolescents exhibited health beliefs in the vulnerable (77.4%), severe (74.2%), and helpful (77.4%) categories, with the highest proportion (81.7%) in the self-confidence category. These findings suggest that most adolescents hold beliefs that contribute to perceived vulnerability and severity, while a notable percentage demonstrate confidence in their health beliefs. Table 3 shows that almost 37% of adolescents demonstrated high-level early detection skills for dengue fever. A statistically significant relationship was found (table 4) between high early detection skills and the dimensions of perceived vulnerability ($p=0.048$), perceived severity ($p=0.025$), perceived benefits ($p=0.028$), cues to action ($p=0.020$), and self-efficacy ($p=0.002$). However, no significant relationship was found between perceived obstacles and early detection skills ($p=0.467$).

Table 1. Characteristics of adolescents based on age, gender, and history of dengue fever (n=93)

Characteristics	f	%	Mean	SD
Age (years)	-	-	16.29	0.685
Gender				
Man	39	41.9		
Woman	54	58.1		
History of dengue fever				
Once	29	31.2		
Never	64	68.8		
Total	93	100		

Table 2. Adolescents' health beliefs about dengue fever (n=93)

Health Beliefs	f	%
Perception of Vulnerability		
Prone to	72	77.4
Not Vulnerable	21	22.6
Perception of Severity		
Critical	69	74.2
Not Severe	24	25.8
Perception of Benefits		
Beneficial	72	77.4
Useless	21	22.6
Perception of Barriers		
Not an obstacle	73	78.5
Obstacle	20	21.5
Cues to action		
Once	74	79.6
Never	19	20.4
Self-Efficacy		
Be confident	76	81.7
Not confident	17	18.3
Total	93	100

Table 3. Early detection skills for dengue fever in adolescents (n=93)

DHF early detection skills	f	%
Good	34	36.6
Enough	29	31.2
Not good	30	32.3
Total	93	100

Table 4. Relationship between health beliefs and early detection skills for dengue fever in adolescents

Health beliefs	DHF early detection skills						Total		p-value
	Good	%	Enough	%	Not Good	%	f	%	
Perception of vulnerability									
Prone to	31	43.1	21	29.2	20	27.8	72	100	0.048
Not Vulnerable	3	14.3	8	38.1	10	47.6	21	100	
Perception of severity									
Critical	29	42	23	33.3	17	24.6	69	100	0.025
Not Severe	5	20.8	6	25	13	54.2	24	100	
Perception of Benefits									
Beneficial	31	43.1	22	30.6	19	26.4	72	100	0.028
Useless	3	14.3	7	33.3	11	52.4	21	100	
Perception of Barriers									
Not an obstacle	29	39.7	22	30.1	22	30.1	73	100	0.467
Obstacle	5	25	7	35	8	40	20	100	
Cues to action									
Once	31	41.9	24	32.4	19	25.7	74	100	0.020
Never	3	15.8	5	26.3	11	57.9	19	100	
Self-efficacy									
Be confident	33	43.4	24	31.6	19	25	76	100	0.002
Not confident	1	5.9	5	29.4	11	64.7	18	100	
Total							93	100	

DISCUSSION

Adolescents Characteristics

In this study, the average age of adolescents was 16.29 years, and they were included in the teenage age group. This aligns with previous research, which states that most high school adolescents are aged 17-21 (Azizah et al., 2023). Other research also states that almost half of public and private high school adolescents are 16 years old (Roiefah, 2021). Based on data from the Jepara Regency Central Statistics Agency, the percentage of adolescents at the secondary level is almost all aged 15-19 years or 92.8%. In this age range, most adolescents undertake school activities, namely 69.1% (BPS Jepara, 2023). This reflects that this age range is in the upper secondary education phase. The research results show that the majority of adolescents are female. The results of this research are in line with previous research, which states that the majority of high school adolescents nationally are women (Pratiwi, 2019); other research results also state that there are more female adolescents in public and private high schools than male adolescents (Roiefah, 2021). Based on basic national education data, the percentage of high school adolescents is more female than male (Ministry of Education and Culture, 2024). This is due to a significant increase in the growth rate of the female population compared to the male population. So, the female population dominates in almost all areas, including the research location.

This research shows that most adolescents have never had a history of dengue fever. This research is in line with previous research, which shows that most teenagers have never experienced dengue fever, 73% of which (Baitanu et al., 2022). The results of this study align with similar research, which shows that almost all adolescents have never experienced dengue fever, 87% of which (Panungkelan et al., 2024). This can be seen in the transmission of dengue fever, including environmental factors, attitudes and location of residence. Adolescents are an age group with high immunity due to their high physical activity level and adequate nutritional intake. However, if adolescent health awareness is low, this will increase the incidence of dengue

fever (Purnama & Yulistiani, 2022). This could cause teenagers' lack of skills in recognizing the signs and symptoms of dengue fever. Environmental factors and awareness are still the dominant factors in dengue fever transmission. Based on this, it can be concluded that the incidence of dengue fever in adolescents is influenced by awareness, attitudes and location of residence. Adolescents who have high immunity and a high level of awareness can avoid the incidence of dengue fever.

Health beliefs

This study's results show that most adolescents feel vulnerable to transmission of dengue fever. This is in line with previous research, which shows that almost all teenagers perceive the vulnerability of 80% in dengue detection and prevention behaviour (Musta'inah et al., 2020). Similar research also shows that almost all teenagers perceive the vulnerability of 98.1% in preventing Covid-19 behaviour. (Purnama & Yulistiani, 2022). This happens to teenagers with a high perception of vulnerability and arises because teenagers use social media more often to access information, especially during disease outbreaks. Social media is easier to access as one of the health education media used by teenagers so that teenagers feel they are vulnerable. This will influence treatment or prevention measures. The more someone feels vulnerable, the better preventative behaviour. (Narsih & Hikmawati, 2020). This research shows that most adolescents feel that dengue fever is a severe health condition. This is in line with previous research which shows that most teenagers have a perception of severity of 82% (Musta'inah et al., 2020). The results of this study are also supported by other research, which shows that most teenagers have a perception of severity or seriousness of 63.7% (Putri & Ansari, 2019). Based on several research results, it can be concluded that perceived severity influences adolescent health actions. In the current era, digital media is more effectively used as a medium for health education and social support for youth groups. This media is more interactive and can be accessed repeatedly so teenagers understand better (Ridwan et al., 2020). DHF is a severe disease that can cause death, so the more someone knows the severity of dengue fever, the better the efforts to prevent the disease will be. (Patil et al., 2021).

The results of this study show that almost all adolescents feel the benefits of a health belief. This aligns with previous research, which shows that almost all of them have a perceived benefit of 90% in dengue detection and prevention behavior (Musta'inah et al., 2020). The results of this study are supported by research (Putri & Ansari, 2019), which states that most teenagers have a high perception of benefits, namely 64.5%, of breast self-examination. This can be seen by the number of adolescents using social media more often to access information and ask about their complaints, mainly when they occur to themselves. Websites or social media are more effective for providing health education to adolescents, influencing individuals to feel that they understand the benefits of disease prevention. If someone feels they know the benefits of prevention, the greater their prevention efforts will be (Narsih & Hikmawati, 2020). This research shows that almost all adolescents feel that it is not an obstacle. This is in line with previous research which shows that the majority of teenagers' perceptions report that it is not an obstacle, namely 95% (Musta'inah et al., 2020). The results of this study are supported by research (Putri & Ansari, 2019), who reported that most adolescents had positive perceptions of breast self-examination behaviour. This happens because teenagers do not want to prevent disease. Health education and routine social service once a month can be carried out to increase a person's attention in managing a healthy environment. When someone feels that taking action is not too difficult and does not require effort, they tend to be more motivated in prevention efforts (Surahmawati et al., 2019).

This research shows that almost all adolescents feel they have successfully detected symptoms of Dengue Fever. This is in line with previous research, which shows that almost all teenagers pay attention to diet according to what the doctor recommends in the high category, namely 85%. (Niskalawasti & Dwarawati, 2022). The results of this study are similar to previous research, which stated that almost all teenagers carried out early detection and prevention of dengue fever, namely 93%. The majority of teenagers who receive information about eradicating mosquito nests through print and electronic media and health promotion tend to be active in preventive measures. The more teenagers who receive health education about eradicating mosquito nests, the better their disease prevention efforts will be (Musta'inah et al., 2020). The results of this research show that almost all adolescents have good self-confidence. This is in line with previous research, which shows that most respondents behave well in preventing the transmission of COVID-19 namely 95.5%. (Purnama & Yulistiani, 2022). This is supported by similar research, which states that almost all respondents have a high confidence level in carrying out the recommended nutritional diet, namely 90% (Niskalawasti & Dwarawati, 2022). High self-confidence is one of the results of experience and health information obtained, thus influencing a person to



take preventive measures. Support from those closest to you can help increase a person's confidence to take action independently (Purnama & Yulistiani, 2022).

Health beliefs are health behaviours determined by an individual's perception of beliefs about disease and reduce the occurrence of disease symptoms experienced by the individual. There are several dimensions that influence health beliefs, namely perceived vulnerability, perceived severity, perceived benefits, perceived barriers, cues to action, and self-confidence (Surahmawati et al., 2019). Based on the research results, the majority of adolescents showed reasonable confidence with a perception of vulnerability of 77.4%, perception of severity of 74.2%, perception of benefits of 77.4%, perception of obstacles of 78.5%, cues to action of 79.6%, and self-efficacy of 81.7%. This is because social media, when used responsibly, can be a valuable source of health information that helps increase health confidence among adolescents. By accessing credible sources and health-related content, adolescents can enhance their understanding and trust in health practices. Reasonable health beliefs can increase better preventive measures, especially dengue fever in adolescents, through the use of digital media. Poor health beliefs are the result of a lack of understanding in managing disease and perceptions in efforts to prevent disease. Poor health beliefs are influenced by teenagers' perceptions, such as teenagers' lack of attention to managing the environment and lack of health literacy. So, it hurts teenagers who experience dengue fever symptoms such as fever, weakness, red rash, and even death.

DHF early detection skills

This research shows that almost half of the adolescents have good early detection skills for dengue fever. As shown in Table 3, good early detection is characterized by several key factors. Diagnostic accuracy ensures conditions are identified with minimal error, while timeliness refers to detecting diseases early, enabling faster intervention. Adolescents' involvement highlights the importance of awareness and participation in screenings, and service accessibility ensures detection programs are available across healthcare levels. The training of adolescents is crucial for accurate detection, and the sustainability of screening programs ensures consistent follow-up. Post-diagnosis care focuses on the management of detected conditions, while community acceptance ensures high participation rates. Additionally, cost-effectiveness and integration with healthcare systems are important for the program's reach and efficiency.

This research aligns with previous research showing that most respondents have good early detection skills for dengue fever at 52.8%. (Amanda et al., 2023). This is in line with research conducted by (Sulistiyanto, 2023), which also explained that most respondents experienced early disease detection skills in the good category, namely 52.9%. Early detection skills are the ability to identify early signs of health problems in a disease. Factors that influence early detection skills are level of education, experience, age and occupation (Notoatmodjo, 2014). Good early detection skills indicate that the individual has a high level of understanding about health, has a history of previous dengue cases, and even experience managing dengue cases. Health literacy and self-efficacy can influence early detection skills (Aryawati et al., 2022). This can influence people's attitudes and behavior in early detection, and high self-confidence in early disease prevention and level of education can influence good early detection skills. (Amanda et al., 2023).

The level of health knowledge and confidence also influences early detection skills for dengue fever or other diseases in the low to high categories (Baitanu et al., 2022). Good early detection behaviour in adolescents occurs with developing health information. Teenagers and adults prefer practical and straightforward things rather than queueing at the nearest health service centre. Developing a health information system can help the public consult doctors about their health, carry out drug transactions, and provide health education if outbreaks such as dengue fever and COVID-19 occur. (Ridwan et al., 2020). This is because most teenagers have a high level of health knowledge and reasonable access to information, so they are more confident in taking preventive measures against certain diseases. The many conveniences of digital systems mean that early detection skills are good. The level of education, health information, history of dengue fever, and experience of adolescents can improve early detection skills for dengue fever. The use of information systems that are developed and easy to access influences the level of adolescent health knowledge, thus forming good early detection skills.

Relationship between Health Beliefs and DHF Early Detection Skills in Adolescents

The research results showed that health beliefs were related to early dengue detection skills in terms of perception of susceptibility, severity, benefits, cues to action, and self-efficacy. However, the dimension of perceived barriers is not related to early detection skills for dengue fever. This research explains that the higher the group perception, the better the behaviour of early detection of dengue fever skills. Adolescents with beliefs and a high perception of vulnerability form an awareness of the high risk in dengue-endemic areas. Adolescents' perception of severity is in the high category if they understand and experience dengue fever, encouraging adolescents to take action in the early detection of dengue fever. Even though teenagers have perceptions of obstacles, they tend to have higher perceptions of benefits that shape self-efficacy through the process of receiving information, seeking information, and the experiences that teenagers have.

This research is in line with research (Musta'inah et al., 2020); the results obtained were that the majority of respondents had the perceived vulnerability attitude dimension in the good category, namely 78% with a p-value = 0.030 (<0.05), meaning that there was a relationship between perceived vulnerability and behavioural efforts for early detection and prevention of dengue fever. Perceived severity of attitude is in a suitable category, namely 64.8% with a p-value = 0.200 (>0.05), meaning that there is no relationship between perceived severity and behavioural efforts for early detection and prevention of dengue fever. Perception of benefits in the good category is 90%, p-value = 0.032 (<0.05), meaning a relationship exists between perceived severity and behavioural efforts for early detection and prevention of dengue fever. Perceived barriers are included in the positive category, namely 95% with a p-value = 0.282 (>0.05), meaning there is no relationship between perceived severity and behavioural efforts for early detection and prevention of dengue fever. Willingness to act is included in the positive category, namely 84.1% with a p-value = 0.003 (<0.05), meaning a relationship exists between perceived severity and behavioural efforts for early detection and prevention of dengue fever.

A study Paluseri et al., (2023) shows that most respondents have the dimension of perceived vulnerability in society increasing to 90.1% with a p-value = 0.021. Perception of severity/seriousness shows that the public's perception of severity reached 91.5% with a p-value = 0.000. Perception of benefits shows the perception of benefits of prevention efforts in the good category of 95.8% with a result of $p = 0.001$. Perception of barriers shows that a good attitude is not an obstacle at 88.7% with a p-value = 0.000. Cues to action show that dengue prevention action behaviour has increased well, reaching 83.1% with a p-value = 0.015. Health beliefs consist of several dimensions: perceived susceptibility, perceived severity, perceived benefits, perceived barriers and cues to action related to dengue disease detection behaviour and environmental interventions. Similar research was conducted (Purnama & Yulistiani, 2022) shows that the majority of respondents have a positive vulnerability perception dimension of 98.1% with a p-value = 0.000, a positive perception of the severity of 89.4% with a p-value = 0.005, a positive perception of benefits of 98.7% with a p-value = 0.000, a positive perception of obstacles of 88.9% with a p-value = 0.860. There was no significant relationship with perceived obstacles; positive cues to action were 96.2% with a p-value = 0.000, and positive self-efficacy reached 95.5% with a p-value = 0.000. Health beliefs consisting of perceived vulnerability, perceived severity, perceived benefits, cues to action and self-efficacy are related to preventive behaviour and early detection of COVID-19. In contrast, perceived barriers are not related to preventive behaviour and early detection of COVID-19.

The research carried out (Putri & Ansari, 2019) states that health beliefs with early cancer detection for most adolescents have a high perception of seriousness dimension 63.7%, a high perception of vulnerability 62.9%, high perception of benefits 64.5%, low barriers 66.5% cues to active action 77.7% and good detection practices 65% in this study shows a value of $p = 0.001$, meaning there is a significant relationship. Female adolescents feel vulnerable to breast cancer; student self-efficacy shows that adolescents are 9 times more likely to do so compared to those who do not believe in themselves. Respondents experienced difficulties in BSE due to a lack of health information and health literacy.

Research conducted (Rohmah & Anggraeni, 2021) stated that almost half of the respondents had reasonable health beliefs of 36.5% with the dimension of health beliefs, half of the respondents had a good perception of vulnerability of 44.4%, a good perception of severity of 46%, the majority of respondents had a high perception of benefits of 67.5%. However, the perception of barriers is not good, namely 67.9% in IVA examinations. This is due to a lack of information regarding VIA examinations and awareness of visits to women of childbearing age for early detection of cervical cancer. Health beliefs can influence the level of public health. Each individual has a confidence assessment of the vulnerability and severity level to carry out disease prevention detection efforts well (Surahmawati et al., 2019). The greater the perception of vulnerability and severity, the greater



the individual's ability to overcome health problems. Adolescents who do not feel vulnerable and do not feel serious about a disease are less likely to implement early detection and prevent disease. This is due to a lack of knowledge about the threat and severity of a disease (Musta'inah et al., 2020).

Perception of benefit is forming a new behaviour to reduce the risk of disease development. However, perceived benefits have a relationship with self-efficacy, which is the point of a person's belief in doing something and taking the right action. The greater a person's perception of the perceived benefits of an action, the more it will influence their willingness to continue efforts to prevent and detect disease, especially dengue fever. On the other hand, the lower a person's perception of the perceived benefits, the more it will influence a person's willingness to manage disease prevention (Attamimy et al., 2017). In this study, the obstacles felt by the youth group were a lack of attention and increasing busyness at school, so these became reasons for obstacles in efforts to increase dengue prevention measures. Most obstacles experienced are the absence of health facilities and poor compliance with health protocols. Therefore, there is a need for interventions to reduce perceived barriers by providing hand washing and education on health protocols. The very high barriers mean that efforts to take health measures and implement COVID-19 health protocols are increasingly poor (Purnama & Yulistiani, 2022).

Cues to action are the actions of internal or external factors in a joint effort to reduce the level of disease. The higher the level of action, the better the motivation to take action. Likewise, the more often a person experiences information on recommended actions to detect disease, the better their initial disease prevention efforts (Paluseri et al., 2023). Based on the results of this study, it can be concluded that there is a relationship between health beliefs and the dimensions of perception of vulnerability, severity, benefits, cues to action and self-efficacy in dengue fever early detection skills in the adolescent group, however, in the perception of barriers that occur there is no significant relationship with dengue early detection skills in the adolescent group. This is because all dimensions of health beliefs influence individual behavior in deciding on actions and changing behavior. Good information and experience influence one's perceptions. The higher an individual's health confidence is, the better a person is at carrying out DHF early detection skills. Conversely, the lower a person's perception of a disease is, the worse the DHF early detection skills are. This research has several limitations, including the respondents' lack of understanding in answering the questions in the questionnaire, so the researcher helped explain the meaning of the questions to the respondents even though this questionnaire had been previously tested for validity and reliability. The research timeline did not align with the specified target due to the absence of several potential respondents during the data collection period. This occurred because participants were unavailable due to illness or other unforeseen circumstances. Despite this, the study sample remains representative of the target population, and the findings remain valid within the scope of the collected data.

CONCLUSION

Health beliefs in almost all dimensions are related to early dengue detection skills in adolescents. These dimensions are perceptions of vulnerability, severity, benefits, Cues to action, and self-efficacy. However, dimensions Perception of barriers is not related to early detection of dengue fever skills. The results of this study provide an overview of several dimensions of health beliefs that shape early dengue detection skills in adolescents so that they can be used as a reference in developing the proper intervention by considering dimensions of Health beliefs. Schools and health centres can collaborate in developing innovative media and interventions to promote and prevent dengue transmission among adolescents at school. The interventions and media developed can be based on increasing adolescents' health beliefs and ability to detect dengue fever early. Future research can analyze other factors related to early dengue detection skills, such as health literacy, self-efficacy, treatment-seeking behaviour, stigma, family support, perceptions, attitudes, self-confidence, etc.

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