Validity and reliability questionnaire test of knowledge, Attitudes, and behavior on dengue fever prevention

Fitria Dewi Puspita Anggraini[1], Aprianti[2], Nor Amalia Muthoharoh[3], Indah Permatasari[4], Jihan Listu Azalia[5]

[1,2,3,4,5]Faculty of Public Health, Universitas Dian Nuswantoro Semarang, Central Java, Indonesia

Article Info	ABSTRACT
	It is necessary to have standardized instruments that validity and reliability to ensure the data to be collected. This research to test the validity and reliability of the knowledge, attitude and behavior questionnaire on dengue fever prevention. This study used a quantitative method with a cross sectional design. The population were patients with diagnoses of DD, DHF, and DSS based on Rowosari Health Center medical record data for January 2022-January 2023 as many as 248 people. The samples taken were 30 people from Tembalang, Meteseh, Bulusan and Kramas Villages by simple random sampling methode. Data collection was carried out using a questionnaire. Validity test is done by Pearson Product Moment test. The questionnaire valid if the r count value is > from r table with a correlation value > 0,361. The reliability test was declared reliable if value >0,600 with Cronbach's Alpha analysis. Result for knowledge, attitude and behavior questionnaire item are 16 from 20 statements, 14 from 15, and 9 from 10 statements item are valid with R Count Pearson Correlation Value > 0,361. Test the reliability of knowledge, attitude and behavior variables with Cronbach's Alpha value of 0,774 ; 0,815 and 0,818 > 0,600 so that all statement items are reliable. Questionnaire can be used as a reference to measure knowledge, attitude and behavior on dengue fever prevention. *This is an open access article under the CC BY-NC license.*

Corresponding Author:

Fitria Dewi Puspita Anggraini,
Departmen/Study Program/Departement,
Faculty of Public Health,
Nakula 1 Street No. 5-11, Pendrikan Kidul, Semarang Regency, Central Java, 50131, Indonesia.
Email: fitriadewi@dsn.dinus.ac.id

1. INTRODUCTION

Dengue infection is a group of diseases caused by dengue virus in humans. The disease is divided into Dengue Fever (DD), Dengue Hemorrhagic Fever (DHF), and Dengue Shock Syndrome (DSS) (Wang et al., 2020) . Dengue virus belongs to the group of arthropod-borne viruses, the genus flavivirus, family flaviviridae. This virus has 4 serotypes (DENV-1, DENV-2, DENV-3 and DENV-4) (Rosid et al., 2019) which have been identified as circulating in several parts of the world, especially in tropical and subtropical regions, including Indonesia. Currently around 2.5 billion or approximately 40% of the world's population live in areas that are at risk of transmitting dengue infection. The World Health Organization or WHO estimates that there are around 50 to 100 million cases of dengue infection each year (Ministry of Health, 2020).

Various efforts have been made to reduce dengue cases, including cutting contact with humans through vector control programs. Efforts to control the DHF vector were carried out

including through physical control (using mosquito rackets and gauze on windows), biological control (raising larvae-eating fish), chemical control (using mosquito repellents), and self-protection (using mosquito repellent lotions). There are other methods that are not currently used in large scale control programs, such as the introduction of the bacteria Wolbachia and/or genetically modified mosquitoes with the intent of replacing and/or reducing the naturally occurring vector with vectors that have a limited capacity to reproduce and/or to transmit the dengue virus (Horstick et al., 2017). Vector control remains the primary method to prevent dengue infections. Environmental interventions represent sustainable and safe methods as there are limited risks of environmental contamination and toxicity (Buhler et al., 2019). In addition to the efforts made by the community, vector control activities are also carried out by local governments, including fogging of adult mosquitoes (fogging), larvicidation, and eradication of mosquito nests (PSN) (Prasetyowati et al., 2018). Integrated control measures have also been developed in the context of Integrated Vector Management (IVM) with possible synergies between chemical, biological, and environmental approaches (Horstick et al., 2017). PSN activities through the 3M plus movement have been proclaimed by the government, namely closing water reservoirs, burying used items that can become mosquito breeding grounds, and draining water reservoirs every week on a regular basis. The goal of the PSN movement is to monitor and eliminate potential breeding sites for dengue vector mosquitoes (Ambarita et al., 2020). Vector control efforts require the active and active participation of the community so that they must be supported by good knowledge, attitudes and actions regarding vector control (Mangindaan et al., 2018). Knowledge about DHF includes knowledge about signs and symptoms, transmission, vectors that cause, prevention , as well as management. Respondents' attitudes or tendencies regarding matters related to DHF, including: prevention of DHF, awareness of DHF, actions to take if suspected of DHF (Simaremare et al., 2020). Attitudes are strongly influenced by personal experience of dengue infection. When a person or relative has experience of being infected with the dengue virus, that person will be more positive, alert and careful about the spread of the dengue virus (Purnama et al., 2013).

Respondents' behavior related to prevention and control of DHF. Some preventive behaviors in avoiding Aedes mosquitoes are using mosquito lotion containing DEET or picaridin during the day, wearing long sleeves to avoid bites, using mosquito coils, insecticide spray, windows with cloth, and using air conditioning when indoors (Putri et al., 2022). Health behavior is a person's response to stimuli related to illness and disease, the health care system, food and the environment. The health behavior domain can be measured from knowledge, attitudes, and practices or actions (Espiana et al., 2022). In measuring knowledge, attitudes and behavior in preventing DHF, it is necessary to have standardized measurement tools, this is done to ensure the accuracy of the data to be collected. Measuring instruments that have standards must meet the requirements for validity and reliability (Dewi & Sudaryanto, 2020). Therefore, the main focus of the research method is the validity and reliability aspects of preparing the questionnaire that will be used as a data collection tool in the field. The questionnaire is the instrument/tool most often used in the method of collecting and evaluating research results (Bhattacharyya et al., 2017).

Validity describes how well the data collected covers the actual area of investigation. Validity basically means "measuring something to be measured". The indicators in the questionnaire can be said to be valid if the r count results are greater than r table (r count > r table) (Oktavia et al., 2018). Validity is an index that shows the measuring instrument actually measures something that is to be measured. Reliability related to the measurement of a phenomenon or data that provides stability to the results is also related to the consistency of repetition (Bhattacharyya et al., 2017)

Previous research on testing the validity and reliability of knowledge questionnaires regarding knowledge, attitudes, and dengue prevention behaviors found results that from testing the validity of the instrument on 60 question items, there were 46 question items that were declared valid with a correlation value greater than 0.361. While the reliability test of question items knowledge, attitudes, and behavioral analysis regarding knowledge, attitudes and behavior shows a Cronbach Alpha value > 0.60, so that the instrument being tested can be declared reliable or

consistent (Dewi & Sudaryanto, 2020). Research related to validity and reliability tests concerning knowledge, attitudes and behavior in preventing dengue hemorrhagic fever has indeed been carried out before, but the results of previous studies have not included valid question items from the test results, so researchers are still interested in testing the validity and reliability of knowledge questionnaires, Dengue prevention attitudes and behavior.

2. RESEARCH METHOD

The method used in this study using quantitative research methods with cross sectional design. The population used in this study were patients who were diagnosed with Dengue Fever, Dengue Hemorrhagic Fever, and Dengue Shock Syndrome, based on medical record data at the Rowosari Health Center for January 2022-January 2023, as many as 248 people. The samples taken in this study were 30 people from Tembalang, Meteseh, Bulusan and Kramas Villages. Sampling was done by simple random sampling. Data collection to obtain data about the results of the questionnaire test in this study was carried out by making a list of statements that would be used to conduct the questionnaire test. The list of statements or questionnaires was made by the researchers themselves based on existing theories. The questionnaire that has been made consists of an informed consent sheet which is on the main sheet as proof that someone is willing to be a respondent, then the identity of the respondent and the next sheet, namely the knowledge level questionnaire which consists of 20 questions used to measure the level of individual knowledge. in carrying out DHF prevention, an attitude questionnaire with 15 statements to measure individual attitudes in carrying out DHF prevention. Furthermore, the questionnaire regarding behavior consists of 10 statements that are used to determine the efforts made by individuals in preventing DHF. Testing the validity of the research instrument can be declared valid if each question item in the questionnaire can be used to reveal something that will be measured by the questionnaire. The indicators in the questionnaire can be said to be valid if the calculated r count is > from r table. If one of the questions on the questionnaire list has a Pearson correlation value <0,361 then the question item cannot be used in subsequent analysis, or it can be said to be invalid, while question items that have a correlation value > 0,361 then the question item can be declared valid because it has been meet the criteria. Testing the validity of the instrument in this study was carried out using Pearson Product Moment analysis (Prastyo, 2017). Reliability test on a research instrument is a test used to find out whether the questionnaire used in collecting research data can be said to be reliable or not. In the reliability test of this study was carried out using Cronbach's Alpha analysis. If a variable shows a Cronbach Alpha value > 0,600, it can be concluded that this variable can be said to be reliable or consistent in measuring (F. D. P. Anggraini et al., 2020). Analysis of the validity and reliability of the study was carried out using the SPSS version 26 computer program.

3. RESULTS AND DISCUSSIONS

After testing the validity using the SPSS 26 program, it can be seen that the statements that have met the requirements can be reviewed from the results of their validity. The following are the results of validity tests that have been carried out using the SPSS 26 computer program.

Table 1. Results of the Knowledge Questionnaire Item Validity Test

No.	R Count Pearson Correlation	R Table	Note
1	0,437	0,361	Valid
2	0,566	0,361	Valid
3	0,589	0,361	Valid
4	0,346	0,361	Invalid
5	0,433	0,361	Valid
6	0,407	0,361	Valid
7	0,362	0,361	Valid
8	0,391	0,361	Valid
9	0,521	0,361	Valid
10	0,389	0,361	Valid

11	0,339	0,361	Invalid
12	0,532	0,361	Valid
13	0,425	0,361	Valid
14	0,498	0,361	Valid
15	0,625	0,361	Valid
16	0,448	0,361	Valid
17	0,460	0,361	Valid
18	0,351	0,361	Invalid
19	0,551	0,361	Valid
20	0,204	0,361	Invalid

Source: (SPSS Processed Data, 2023)

Based on table 1 above, of the 20 statement items regarding knowledge, 16 of them are valid. Invalid question items are indicated in questions number 4, 11, 18, and 20 because the value of r count < r table. These four question items also have a Pearson correlation value < 0,361.

Table 2. Results of the Attitude Questionnaire Item Validity Test

No	R Count Pearson Correlation	R Table	Note
1	0,507	0,361	Valid
2	0,560	0,361	Valid
3	0,746	0,361	Valid
4	0,640	0,361	Valid
5	0,735	0,361	Valid
6	0,535	0,361	Valid
7	0,492	0,361	Valid
8	0,698	0,361	Valid
9	0,625	0,361	Valid
10	0,368	0,361	Valid
11	0,328	0,361	Invalid
12	0,507	0,361	Valid
13	0,630	0,361	Valid
14	0,560	0,361	Valid
15	0,383	0,361	Valid

Source: (SPSS Processed Data, 2023)

Based on table 2 above, of the 15 statement items regarding attitudes, 14 of them are valid. Invalid question items are shown in question number 11 because the value of r count < r table with a Pearson correlation value < 0,361.

Table 3. Results of the Behavioral Questionnaire Item Validity Test

No	R Count Person Correlation	R Table	Note
1	0,540	0,361	Valid
2	0,659	0,361	Valid
3	0,799	0,361	Valid
4	0,645	0,361	Valid
5	0,540	0,361	Valid
6	0,683	0,361	Valid
7	0,308	0,361	Invalid
8	0,539	0,361	Valid
9	0,636	0,361	Valid
10	0,737	0,361	Valid

Source: (SPSS Processed Data, 2023)

Based on table 3 above, of the 10 statement items regarding behavior, 9 of them are valid. Invalid question items are shown in question number 7 because the value of r count < r table.

Table 4. Recapitulation of Knowledge, Attitude and Behavior Questionnaire Items for Prevention of Dengue Fever

	Knowledge	Note
No	Instruction: Each statement is filled with "yes" or "no"	
1	The cause of DHF (Dengue Hemorrhagic Fever) is a virus	Valid
2	Mosquito bites are a source of dengue transmission	Valid

3	Dengue cannot be prevented	Valid
4	The mosquito that transmits Dengue infection only bites at night	Invalid
5	The characteristics of the DHF mosquito are its wings and body with white stripes	Valid
6	The 3M Plus program is an effort to prevent dengue	Valid
7	Bathtubs, drums, buckets, used cans, flower vases, trash bins can become breeding grounds for dengue mosquitoes	Valid
8	The first aid measure for DHF patients at home is giving fluids to prevent dehydration	Valid
9	Early signs or symptoms of DHF sufferers are high fever and red spots	Valid
10	The type of mosquito that transmits dengue fever is the Anopheles mosquito	Valid
11	Fogging is an effort to eradicate mosquito larvae	Invalid
12	Abatization (giving abate powder) is an effort to eradicate mosquito larvae	Valid
13	Raising larvae-eating fish in the bath is included in PSN activities	Valid
14	Sowing abate powder in a water reservoir is permissible without rules	Valid
15	Dengue fever cannot be transmitted to other people	Valid
16	Fogging or fumigation is more effective in tackling DHF than PSN	Valid
17	Dengue mosquitoes breed in dirty water	Valid
18	A good activity to drain the bath is 1-2 times a week	Invalid
19	3M plus activities at home can only be done by certain people	Valid
20	Dengue only attacks children	Invalid

<center>Attitude</center>

No	Instruction: Each statement is filled with SS (Strongly Agree), or S (Agree) or TS (Disagree) or STS (Strongly Disagree)	Result
1	Believe that dengue fever can be prevented and controlled	Valid
2	I will do the 3M Plus movement to prevent Dengue hemorrhagic fever	Valid
3	Just drain the tub if it's dirty	Valid
4	The water in the flower vase does not need to be replaced	Valid
5	If there are family members who experience high fever, nosebleeds, and red spots on the skin, I will take my family members directly to health services	Valid
6	Clothes are better hung indoors or room	Valid
7	Places that can collect water need to be covered	Valid
8	Stagnant water in the home environment should be left alone	Valid
9	Healthy people cannot be infected with dengue fever	Valid
10	I will sprinkle abate powder on the water tank	Valid
11	Raising larval predatory fish in water reservoirs which can eat *Aedes aegypti* mosquito larvae	Invalid
12	Planting mosquito repellent plants to prevent Dengue Hemorrhagic Fever	Valid
13	Do not use mosquito coils or mosquito repellent to prevent Dengue Hemorrhagic Fever	Valid
14	Drains that are clogged or not smooth must be cleaned immediately	Valid
15	Sleeping using mosquito nets can reduce bites from mosquitoes	Valid

<center>Behaviour</center>

NO.	Instruction: Each behavior-related statement is filled with always or often or sometimes or rarely or never Always : Always do (7 days a week) Often : Do it often (5-6 days a week) Sometimes : Once in a while (3-4 days a week) Rarely : Not often (1-2 days a week) Never : Absolutely never do *Behavior of the last week	Note
1	Wear long-sleeved clothing when on the move	Valid
2	Close the water reservoir after use	Valid
3	Draining and scrubbing the surface of the tub/water reservoir	Valid
4	Sprinkle abate powder in the water reservoir	Valid

5	No hanging clothes	Valid
6	Get rid of used items which can potentially hold water	Valid
7	Use mosquito nets when going to sleep	Invalid
8	Use lotion or spray or burn mosquito repellent while sleeping / on the move	Valid
9	Replacing water in flower vases, drinking containers birds or other similar places on a regular basis to prevent the development of mosquito breeding	Valid
10	Clean up trash that causes drains or gutters to not run smoothly	Valid

Source: (SPSS Processed Data, 2023)

The validity test was carried out to assess the level of accuracy of a question and statement in the questionnaire, so that items that are not considered valid can be removed from the questionnaire (Budiastuti & Bandur, 2018)

Table 5. Questionnaire Reliability Test Results

Variable	Cronbach's Alpha	N of items
Knowledge	0,774	20
Attitude	0,815	15
Behaviour	0,818	10

Source: (SPSS Processed Data, 2023)

Test the reliability of knowledge, attitude and behavior variables with Cronbach's Alpha value of 0,774 ; 0,815 and 0,818 > 0,600, it can be concluded that the questions for the questionnaire measuring knowledge, attitudes and preventive behavior are reliable or consistent. Cronbach is the most commonly used test to determine the reliability value of the questionnaire. Cronbach's result is a number between 0 and 1. The acceptable reliability score is > 0,600 (Heale & Twycross, 2015).

This research is in line with the results of research conducted by (Dewi & Sudaryanto, 2020) regarding the validity test in preparing a questionnaire of knowledge, attitudes and behavior for dengue fever prevention. As a result, the validity test conducted on the knowledge questionnaire obtained 5 invalid question items because the correlation value was less than 0,361 so that only 15 of the 20 question items tested were declared valid. Test the validity of the attitude questionnaire from the 20 questions tested, there are 6 question items that are invalid because the correlation value is less than 0,361 and 14 question items are declared valid. Test the validity of the behavior questionnaire of the 20 questions tested, there are 3 invalid question items and 17 question items that are declared valid with a correlation value greater than 0,361. The limitation of this study is that it does not show valid statement items from the questionnaire. As for the questionnaire test of knowledge, attitudes and behavior in preventing dengue fever, the results obtained were Cronbach's Alpha value of 0,765 ; 0,786 ; and 0,921 > 0,600 which indicates that the three questionnaires that have been tested are declared reliable or consistent and can be used as a measuring tool in conducting research related to knowledge, attitudes, and behavior in preventing dengue fever (Dewi & Sudaryanto, 2020).

The results of another study were carried out to test the validity of preparing a knowledge questionnaire related to Covid-19. Questions on the questionnaire are considered valid if the calculated R count is greater than the R table. The R table value for 631 samples is 0,074. If the calculated R count is greater than the R table value then the question is considered valid, and if the R calculated value obtained is lower than the R table value then the question is considered invalid and cannot be used. From the results of the validity test conducted, it was found that 14 questions were invalid. After the instrument was repaired, the validity test was again carried out on 40 different respondents with a total of 36 questions asked. The results of the validity test obtained 6 invalid questions so that 6 invalid questions had to be dropped out. As for the results of the Cronbach Alpha Coefficient statistical test conducted, it was found that the Cronbach Alpha Coefficient > 0,600, it can be concluded that the knowledge questionnaire about Covid19 (SARS-CoV-2) is reliable to be used as a research instrument to measure knowledge about Covid-19 (SARS-CoV) -2) (Darsini et al., 2020).

Another study conducted at SMPN 02 Limboto Gorontalo regarding the validity and reliability of the knowledge, attitude, and nutritional behavior questionnaire in adolescents showed that out of 21 items of nutritional knowledge questions, 2 items were invalid, from 27 question items, 2 items were not valid, 15 items of balanced nutrition attitude statement there are 2 invalid items, 13 items of valid balanced nutrition behavior statement. Internal reliability test for knowledge of balanced nutrition, attitudes and behavior of balanced nutrition (cronbach α = 0,687 ; 0,653; 0.680 and 0,725 respectively (Nuryani, 2020).

Validity and reliability tests must be presented in a concise and precise research method. Validity indicates the truth of a finding, while reliability refers to the consistency of findings (Putri et al., 2022). Validity and reliability increase the value of transparency and reduce opportunities for bias from research results in qualitative research (D. Anggraini et al., 2020). Without testing the validity and reliability, researchers will find it difficult to describe the existence of measurement errors based on the theory of the variable being measured (Santoso et al., 2017). There is a relationship between validity and reliability (Azraii et al., 2021). Any instrument can be reliable even though the validity test results are not valid. However, the research instrument will not be valid if the reliability test results are not reliable. In other words, if an instrument is declared valid, then the results must be reliable (Aithal & Aithal, 2020). In general, conducting an instrument validity test is more difficult to do than conducting a reliability test because validity testing is a data measurement activity related to knowledge while reliability testing only related to score consistency (Tsang et al., 2017). The instrument can be validated when the previous theory or literature is a hypothesis that can be concluded (Taherdoost, 2018).

4. CONCLUSION

The validity test showed that there were 16 knowledge question items, 14 attitude question items, and 9 behavior question items that were valid with a p value > 0,361. The reliability test showed that all questionnaire items were reliable with Cronbach Alpha 0,774; 0,815 and 0,818 > 0.600. The limitation of this study is that the number of samples taken only came from 1 working area of the public health centre.

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