



Validity and Reliability of the Parental Independence Questionnaire on the Care of Children with Bronchial Asthma

Sari Luthfiyah¹, Her Gumiwang Ariswati¹, Melyana Nurul Widyawati², Hendrik³, May Peralta Mendinueto⁴

¹ Department of Medical Electronics Technology, Poltekkes Kemenkes Surabaya, Indonesia

² Department of Midwifery, Poltekkes Kemenkes Semarang, Indonesia, Indonesia

³ Surabaya Haji Hospital, Surabaya, Indonesia, Indonesia

⁴ Department of Nursing, Centro Escolar University, Philippines

*sarilut@poltekkesdepkes-sby.ac.id

Abstract. Bronchial asthma is a chronic inflammatory disorder of the airways that causes recurrent episodes of wheezing, shortness of breath, chest tightness and coughing. In Indonesia, the results of the Basic Health Research (Riskesdas) in 2018 showed that the prevalence of asthma in Indonesia was found to be 4.8%. Parental independence in caring for children with Bronchial Asthma is very important in achieving asthma control. Parents' independence in caring for children with bronchial asthma can be seen by measuring the level of knowledge, attitudes and behaviour towards bronchial asthma. This study aims to determine the validity of the reliability of the questionnaire on knowledge, behaviour and attitudes of parents in caring for children with Bronchial Asthma. This study used quantitative methods with 30 respondents. Pearson product moment and Cronbach's alpha were used as validity and reliability tests. The test results show that all indicators on the knowledge, attitude and behaviour variables have good validity values, with the p value of the Pearson correlation test less than 0.05. The test results show that all variables have good validity values, with a Pearson correlation test p value of less than 0.05. The test results show that all variables have good reliability values, with an Alpha Cronbach value greater than 0.7. The results of validity and reliability testing show results that are in accordance with the standard provisions set, so that the measuring instrument or questionnaire can be continued to be used for research analysis.

Keywords: Validity and Reliability test, Questionnaire, Parental, Bronchial asthma

1 Introduction

Bronchial asthma is a chronic inflammatory disorder of the airways that causes recurrent episodes of wheezing, shortness of breath, chest tightness and coughing[1][2][3]. Symptoms are generally reversible and fluctuate with or without treatment. Fluctuating in this case means that in certain periods it can be calm without

symptoms and does not interfere with activities, but in emergency conditions that do not get fast and proper treatment, it can cause exacerbations with mild to severe symptoms and even cause death.

In Indonesia, the prevalence of asthma is unknown, but it is estimated that 2-5% of the Indonesian population has asthma. The incidence of asthma in children and infants is around 10-85% and higher than in adults (10-45%)[4]. In children, asthma disease can affect the growth period, because children who suffer from asthma often experience relapses, which can reduce learning achievement at school. The prevalence of asthma in urban areas is generally higher than in rural areas because the lifestyle in big cities increases the risk of asthma.

As the degree of health and well-being increases. The high incidence, recurrence and mortality rates of paediatric patients with asthma are caused by the lack of awareness and independence of families in performing good self-management[5]. Self-management will be effective if there are objects or media that can guide and remind these activities. The availability of media in the form of the internet and other digital media is one of the efforts to support the implementation of self-management so as to improve the family's ability to manage asthma patients independently[6]. In measuring the level of independence, a set of questioners is needed which contains questions about knowledge, attitude and behaviour variables.

Validity is the level of reliability and validity of the measuring instrument used[7][8]. An instrument said to be valid means that it shows the measuring instrument used to obtain data is valid or can be used to measure what should be measured[9]. Thus, a valid instrument is an instrument that is truly appropriate for measuring what is to be measured. Or it can be said that validity is the extent to which a measuring instrument is right in measuring data, in other words, whether the measuring instrument used does measure something that you want to measure. A variable or question is said to be valid if the variable or question score is significantly correlated to the total score[10][11].

Reliability is a measure that shows that the measuring instrument used in behavioural research has reliability as a measuring instrument, including measured through the consistency of measurement results over time if the measured phenomenon does not change[12][13]. Meanwhile, validity is a measure that shows that the variable being measured is really the variable that the researcher wants to study[14][15][16]. Or it can be said that reliability is a measure that shows the extent to which the measurement results remain consistent when measured several times with the same measuring instrument. Research requires data that is truly valid and reliable[17][18]. Based on this background, research is conducted to develop a questionnaire test that measures independence through measuring parents' knowledge, attitudes and behaviour regarding Bronchial Asthma.

2 Result

This research design uses quantitative methods using SPSS Statistics 25 software[19]. The questionnaire is given to respondents, data based on the questionnaire will be

tabulated and then instrument testing will be carried out, the next process will be carried out by making a correlation test, reliability test[19][20]. The research method used is the survey method. Primary data in this study is data obtained by field surveys through distributing questionnaires to respondents. The research data is in the form of multiple choice question sheet data and questionnaire answer sheets that measure independence through measuring parents' knowledge, attitudes and behaviour regarding Bronchial Asthma disease[21][22]. The data collection technique used is primary data, namely distributing questionnaires to 30 parents who have children suffering from Bronchial Asthma[21][1][23]. The data analysed in the form of validity data, reliability using SPSS Statistics 25 software.

Validity is an index that shows the extent to which a measuring instrument measures what it wants to measure[24]. The level of validity is obtained by comparing the probability of the calculated r value with the r table and if the level of significance or error ≤ 0.05 then the measuring instrument is said to be valid.

Reliability testing starts with validity testing first. If the question is invalid, then the question is discarded. New valid questions together are measured for reliability[25]. The reliability test is useful for determining whether the instrument, in this case a questionnaire, can be used more than once, at least by the same respondent, will produce consistent data. In other words, instrument reliability characterises the level of consistency.

Reliability is a tool for measuring a questionnaire which is an indicator of a variable. A questionnaire is said to be reliable or reliable if a person's answer to a question is consistent or stable over time[26]. The method used to test the reliability of the questionnaire in this study was to use the Cronbach Alpha formula, which was carried out with the help of the SPSS 25 programme. with the following reliability testing criteria: a. If the Cronbach Alpha value is > 0.6 then the questionnaire is reliable. With the following reliability testing criteria: If the Alpha coefficient result is greater than the significance level of 70% or 0.7 then the questionnaire is reliable.

Validity analysis is carried out using product moment correlation technique. For the product moment correlation equation (1) [12]:

$$r_{xy} = \sqrt{\frac{n \sum x^2 - (\sum x)^2}{n \sum y^2 - (\sum y)^2}} \quad (1)$$

Where: r_{xy} : The correlation between variables x and y.

n: The number of data points or observations.

Zn: The z-score for the standard normal distribution. This is used to transform the x and y data into standard normal distributions.

x: The first variable (x).

\bar{x} : The mean (average) of variable x.

y: The second variable (y).

\bar{y} : The mean (average) of variable y.

This formula describes the correlation between two variables, x and y, after transforming both variables into standard normal distributions using z-scores. The Pearson correlation is a measure that assesses the linear relationship between two variables, where the value

of r_{xy} ranges from -1 to 1. A positive value indicates a positive relationship, a negative value indicates a negative relationship, and 0 indicates no linear relationship between the two variables. The data for x and y and know the means \bar{x} ; and \bar{y} ;, as well as the number of observations (n), you can use this formula to calculate the correlation between x and y after transforming both variables into standard normal distributions. The r_{xy} or r_{pbi} value will be compared with the coefficient of the product moment "r" value table at a significant level of 5%. If the r_{xy} or r_{pbi} value of the correlation coefficient is greater ($>$) than the r_{table} value, then the results obtained are significant, meaning that the test items are declared valid.

Reliability is an index that shows the extent to which a measurement tool can be trusted or reliable. A measurement instrument is said to be reliable if its measurements are consistent, careful and accurate. The formula used in reliability testing is Cronbach's Alpha [α] [8].

$$\alpha = \frac{N * \bar{c}}{\bar{v} + (N - 1) * \bar{c}} \quad (2)$$

Where:

N = number of items

\bar{c} = mean covariance between items.

\bar{v} = mean item variance.

The calculations for Cronbach's alpha involve taking the average covariance and dividing it by the average total variance. Therefore, a high alpha value requires the covariance to be high relative to the item variance. In other words, the relationships between the questions account for most of the overall variability. The coefficient value (r_i) will be compared with the correlation table r_{table} . If $r_i > r_{table}$, then the instrument is reliable. In the SPSS output, if Cronbach's Alpha $>$ r_{table} , then the instrument is reliable.

Primary data in this study is data obtained from field surveys through distributing questionnaires to respondents. The data collection technique used is primary data, namely distributing questionnaires to 30 parents who have children with bronchial asthma. This validity test refers, validity is the level of reliability and validity of the measuring instrument used. The instrument is said to be valid if the measuring instrument used (questionnaire) can be used to measure what should be measured. A variable is said to be valid if the variable or question score is significantly correlated with the total score. The level of validation is obtained by comparing the probability of the calculated r value with sig. 0,05. If the significance is less than or equal to 0.05, the instrument or question items correlate significantly with the total score and are declared valid. Reliability is a tool for measuring a questionnaire which is an indicator of a variable. The method used to test the reliability of the questionnaire in this study was to use the Cronbach Alpha formula, which was carried out with the help of the SPSS 17 program. If the Alpha coefficient result is greater than 0.05, the instrument or question items correlate significantly to the total score and are declared valid: If the Alpha coefficient result is greater than the 70% significance level or 0.7 then the questionnaire is reliable (Table 1).

Table 1. Validity Test of Questionnaire

Variable	Sub Variable	Corrected Item- Total Correlation	P Value	Descript.
Knowledge	Bronchial Asthma Definition	0.616**	0.000	Valid
	Symptoms of Bronchial Asthma	0.574**	0.001	Valid
	Time of most frequent asthma symptom re- currence	0.757**	0.000	Valid
	Factors that are most likely to cause asthma symptoms	0.600**	0.000	Valid
	Precipitating factors of asthma	0.476**	0.008	Valid
	Causes of asthma other than allergies	0.496**	0.005	Valid
	How to control bronchial asthma	0.506**	0.004	Valid
	Things that make bronchial asthma worse	0.607**	0.000	Valid
	Ways to manage asthma attacks	0.459*	0.011	Valid
Characteristics of controlled asthma	0.595**	0.001	Valid	
Attitude	When my child's asthma symptoms flare up, I immediately take him to the doctor	0.619**	0.000	Valid
	If my child's asthma symptoms are still mild, I just rest him/her at home.	0.731**	0.000	Valid
	To prevent asthma flare-ups, I avoid factors that cause asthma.	0.679**	0.000	Valid
	When his asthma symptoms decrease, I no longer do asthma control.	0.752**	0.000	Valid
	I control her asthma if she has an asthma at- tack.	0.650**	0.000	Valid
	I still do asthma control even if my child's asthma symptoms decrease.	0.647**	0.000	Valid
	I always control my child's asthma.	0.725**	0.000	Valid
	If my child's asthma does not flare up, I do not go to the hospital/health centre.	0.719**	0.000	Valid
	When my child's asthma relapses, I choose to buy over-the-counter medicine at the stall.	0.734**	0.000	Valid
When my child's asthma relapses, I treat it with medicine from the doctor.	0.698**	0.000	Valid	

Variable	Sub Variable	Corrected Item- Total Correlation	P Value	Descript.
Behaviour	Do you always try to avoid the causes of your child's asthma?	0.680**	0.000	Valid
	Do you go to the doctor immediately when your child's asthma relapses?	0.518**	0.003	Valid
	When your child's asthma flares up, do you go to the hospital/health centre?	0.621**	0.000	Valid
	Do you give your child the medicine recommended by the doctor?	0.542**	0.002	Valid
	Do you give your child foods that are not recommended for asthma?	0.608**	0.000	Valid
	In the past week, did your child need a breathing apparatus?	0.532**	0.002	Valid
	Have your child's asthma symptoms increased in the past week?	0.794**	0.000	Valid
	Has your child's asthma flared up more than twice in the past week?	0.528**	0.003	Valid
	Has your child's asthma flared up more than three times in the past week?	0.577**	0.001	Valid
Do your child's daily activities get interrupted because of his/her asthma?	0.759**	0.000	Valid	

The validity test results show that all indicators on the knowledge, attitude and behaviour variables have good validity values, this can be seen from the Pearson correlation test p value which is less than 0.05. The lowest correlation or validity value is 0.459 to the highest correlation or validity value is 0.794.

Furthermore, the reliability test is a tool used to measure the consistency of a questionnaire which is an indicator of a variable or construct. A questionnaire is said to be reliable or reliable if the answers to the questions are consistent or stable over time. The decision making for reliability testing is that a construct or variable is said to be reliable if it provides a Cronbach's Alpha value > 0.70 (Table 2).

Table 2. Reliability Test of Questionnaire

No	Variable	Alpha Cronbach	Description
1	Knowledge	0.771	Reliable
2	Attitude	0.880	Reliable
3	Behavior	0.812	Reliable

The test results show that all variables have good reliability values, this can be seen from the Cronbach Alpha value which is greater than 0.7. The lowest reliability value is knowledge, which is 0.771 and the highest is attitude of 0.880. The lowest reliability value is knowledge which is 0.771 and the highest is attitude of 0.880. With these results, the reliability of all variables is very good because it reaches a value of 0.880. With these results, the reliability of all variables is very good because it reaches a value of 0.7 and above. The results of validity and reliability testing show results that are in accordance with the standard provisions set, so that the measuring instrument or questionnaire can be continued to be used for research analysis[28][29][30]

3 Discussion

3.1. Reliability Test of Questionnaire

The validity test results show that all indicators on the knowledge, attitude and behaviour variables have good validity values, this can be seen from the Pearson correlation test p value which is less than 0.05. The lowest correlation or validity value is 0.459 to the highest correlation or validity value is 0.794. This statement indicates that the test results conducted on the knowledge, attitude and behaviour variables show that all indicators have good validity values. Validity here refers to the extent to which the indicators actually measure what they claim to measure. In this context, good validity values indicate that these indicators are effective in measuring the constructs they represent, namely knowledge, attitude, and behaviour.

The statement also mentioned that the Pearson correlation test results showed a p value of less than 0.05. A low p value in the Pearson correlation test indicates that there is a significant relationship between the variables tested. In this context, it indicates that there is a significant relationship between the knowledge, attitude and behaviour indicators tested. In addition, the statement provides information on the level of validity of each indicator, with the lowest validity value being 0.459 and the highest validity value being 0.794. This means that the indicator with a validity value of 0.794 is the strongest in measuring the corresponding construct, while the indicator with a validity value of 0.459 is the weakest. However, in this context, all indicators are still considered to have good validity values as they all exceed the threshold usually used to measure validity (usually more than 0.3 or 0.5 depending on the standard used).

This statement indicates that the Pearson correlation test results show a significant relationship between two or more variables that have been tested. In a statistical context, the Pearson correlation test is one method of measuring the extent to which two numerical variables are related to each other. The value generated from the Pearson correlation test is called the Pearson correlation coefficient (r), and its value can range from -1 to 1.

If the value of r is close to 1, it indicates a strong positive correlation, which means that as the value of one variable increases, the value of the other variable also tends to increase. If the r value is close to -1, it indicates a strong negative correlation, which means that as the value of one variable increases, the value of the other variable tends to

decrease. If the r value is close to 0, it indicates that there is no significant correlation between the two variables.

So, when the statement mentions that the Pearson correlation test results show a significant relationship, it means that there is a strong or significant correlation between the variables tested. This relationship can be either positive or negative, depending on the value of r . This result provides insight into how the variables relate to each other in the statistical analysis.

The statement above indicates that the Pearson correlation test results show a significant relationship between the three variables tested, namely knowledge, attitude and behaviour. In this context, the Pearson correlation test is used to measure the extent to which these three variables are related to each other.

In other words, the results of this test imply that: there is a significant relationship between knowledge and attitude: This means that a person's level of knowledge has a significant influence on their attitude towards a particular issue or topic. A positive correlation indicates that the higher a person's knowledge, the more positive their attitude towards the subject being tested, or vice versa. there is a significant relationship between knowledge and behaviour: This indicates that a person's level of knowledge also has a significant influence on their actions or behaviour related to the topic or issue being tested. This indicates that knowledge can influence how a person acts or behaves in relation to that knowledge. there is a significant relationship between attitude and behaviour: This indicates that a person's attitude has a significant influence on their actions or behaviour. In other words, a positive or negative attitude towards a subject can influence actions or behaviours related to that subject. So it can be concluded that the Pearson correlation test results help in understanding the relationship between these variables in a given context and can provide insight into the extent to which these variables are interconnected in the population being tested.

3.2. Reliability Test of Questionnaire

This statement explains the criteria used in decision making when conducting reliability testing of a construct or variable. The criterion is that a construct or variable is considered reliable if it produces a Cronbach's Alpha value greater than 0.70. Cronbach's Alpha is a statistical metric used to measure the level of internal consistency of a group of questions or indicators used to measure a particular construct or variable in a questionnaire or research instrument. The Cronbach's Alpha value ranges from 0 to 1, where: A value close to 1 indicates a high level of internal consistency, which means that the questions or indicators in the instrument are well correlated and reliable in measuring the intended construct. A value close to 0 indicates a low level of internal consistency, which means that the questions or indicators in the instrument do not correlate well with each other and the instrument cannot be relied upon in measuring the intended construct.

In the context of this statement, if a construct or variable produces a Cronbach's Alpha value greater than 0.70, it means that the construct or variable is considered to have an adequate level of internal consistency and can be considered a reliable construct or variable in research or measurement. In other words, the instrument used to measure the construct or variable is considered to meet the reliability standards required for accurate research or measurement. The instrument is reliable.

The test results show that all variables have good reliability values, this can be seen from the Cronbach Alpha value which is greater than 0.7. The lowest reliability value is knowledge, which is 0.771 and the highest is attitude of 0.880. The lowest reliability value is knowledge which is 0.771 and the highest is attitude of 0.880. With these results, the reliability of all variables is very good because it reaches a value of 0.880. With these results, the reliability of all variables is very good because it reaches a value of 0.7 and above. The results of validity and reliability testing show results that are in accordance with the standard provisions set, so that the measuring instrument or questionnaire can be continued to be used for research analysis.

This statement provides information about the results of reliability testing of several variables in a study or measurement. Here is the meaning of the statement: all variables have good reliability values: This means that all variables tested in this study are considered to have a good level of internal consistency. In this case, reliability refers to the extent to which these variables provide consistent and reliable results.

The Cronbach Alpha value is greater than 0.7: The statement states that the Cronbach's Alpha values for all variables are greater than 0.7. This value indicates that these variables have a sufficient level of internal consistency, so they can be considered as reliable variables in measurement. Range of reliability values: The statement also lists the range of reliability values for each variable. The "knowledge" variable has the lowest reliability of 0.771, while the "attitude" variable has the highest reliability of 0.880. This illustrates the level of internal consistency of each variable. Conclusion on reliability: The statement concludes that the reliability of all variables is very good as it reaches a value of 0.880. This means that the instruments or questionnaires used in this study are considered to have a very good level of reliability in measuring these variables. Conclusion on validity and reliability: The statement also noted that the results of the validity and reliability tests were in accordance with the set standards [29][31][28]. Therefore, this measurement instrument or questionnaire can continue to be used for research analysis. This indicates that the measurement tool is considered suitable and reliable to measure the relevant variables in the study..

4 Conclusion

The Pearson correlation test results show a significant relationship between the three variables tested, namely knowledge, attitude, and behaviour. These test results imply that: there is a significant relationship between knowledge and attitude, which means that a person's knowledge has a significant influence on their attitude towards a particular issue or topic. There is a significant relationship between knowledge and behaviour, which indicates that a person's knowledge also has a significant influence on their actions or behaviour related to the topic or issue being tested. There is a significant relationship between attitude and behaviour, indicating that a person's attitude has a significant influence on their actions or behaviour related to the subject.

The Pearson correlation test results help in understanding the relationship between these variables in a particular context and can provide insight into the extent to which these variables are interconnected in the population tested. Thus, we can conclude that

knowledge, attitude and behaviour have a significant relationship in the context of this study. All variables tested in this study were considered to have a good level of reliability as the Cronbach Alpha values were greater than 0.7. The range of reliability values for the variables ranged from 0.771 to 0.880, which illustrates the level of internal consistency of each variable. The main conclusion is that the measurement tools or questionnaires used in this study have a very good level of reliability in measuring the relevant variables. The validity and reliability test results are in accordance with the established standards, so this measurement tool is considered suitable and reliable for use in research analysis.

The measurement tool has an adequate level of reliability and validity, and is reliable in measuring the relevant variables in the research conducted. This supports the use of the measurement tool in the context of the study.

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