

# The effect of leaflet media on the level of mother's knowledge about pneumonia as an effort to prevent pneumonia in toddlers in kalibawang district, wonosobo regency

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**Abstract.** The health problem of toddlers, namely pneumonia, is a serious health problem in Indonesia. To overcome pneumonia, it can be done by educating parents to prevent the occurrence of pneumonia in toddlers which can be done through leaflets. This study aims to evaluate the impact of leaflet media as an educational intervention in increasing maternal knowledge about pneumonia prevention among mothers under five in Kalibawang District, Wonosobo Regency. The pretest-posttest design of one pre-experimental group was used with a total sampling technique, involving 59 posyandu mothers. Maternal knowledge was assessed before and after the intervention. Statistical analysis using the Wilcoxon signed rating test revealed a significant increase in knowledge level ( $p = 0.000$ ). Before the intervention, 60.9% of respondents had moderate knowledge, which increased to 86.7% indicating good knowledge after the intervention. The study concluded that leaflet media effectively increased maternal knowledge about pneumonia prevention. These findings highlight the potential of leaflet-based health education tools to be used in broader public health initiatives to increase public awareness and reduce disease incidence.

## 1 Introduction

Pneumonia is a disease caused by microorganisms such as viruses, bacteria, and fungi that attack the respiratory tract, resulting in acute respiratory infections. Pneumonia that occurs in toddlers is caused by bacteria, namely *Streptococcus pneumoniae* and *Haemophilus influenzae* (1). Based on global data, it is known that the prevalence of pneumonia that causes death in children every year reaches 19,000 lives (2). The prevalence of pneumonia in Indonesia ranks second in the cause of death in toddlers (aged 1-5 years) after diarrhea, accounting for 9.4% of deaths. According to the 2021 Indonesia Health Profile, only 31.4% of pneumonia cases in toddlers receive treatment, with a mortality rate of 0.16%. In Central Java Province, 49.5% of cases of pneumonia in toddlers were identified and treated (13). In

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Wonosobo Regency, 70.5% of children under five were reported to have pneumonia, including 128 cases of severe pneumonia from 64,424 children under five (13).

An alternative to reduce the prevalence of pneumonia in Indonesia can be done through education about the health of toddlers related to pneumonia to parents, especially mothers, which is a strategy to prevent the incidence of pneumonia. Previous research in Balocci Baru Village found that 95% of parents showed increased knowledge about pneumonia prevention after health education (24). Health education can be delivered through various media, including booklets, posters, and leaflets (22). Among them, leaflets have been found to be very effective in increasing public health knowledge due to their accessibility, affordability, and ease of understanding (29). They are a practical medium for delivering consistent health messages, especially in rural areas with limited infrastructure.

Other research on pneumonia is known that leaflets are effective in influencing parents' attitudes and behaviors regarding the prevention of pneumonia. For example, research at the May Regional Hospital Jend. Ryacudu in North Lampung shows the positive impact of health education using leaflets on parents' attitudes towards pneumonia prevention (3). Maternal knowledge is essential because it directly influences early symptom recognition, timely medical intervention, and preventive practices such as immunization and hygiene improvement.

This study aims to evaluate the impact of leaflet media on mothers' knowledge about the prevention of pneumonia in toddlers in Kalibawang District, Wonosobo Regency. By focusing on areas with high prevalence, this study seeks to contribute to evidence-based strategies to improve maternal knowledge and reduce pneumonia cases in rural Indonesia.

## **2 Materials and methods**

### **2.1 Study design**

This study uses a pre-experimental quantitative design using a one-group pretest-posttest approach. Data was collected by conducting a pretest (initial observation), followed by intervention (health education through leaflets), and ending with a posttest (final observation). The research was conducted at the Kalibawang District Posyandu in Wonosobo Regency from April to May 2024.

### **2.2 Population, sampling and sampling techniques**

The population in this study is posyandu women in Kalibawang District, The research population consists of posyandu women in Kalibawang District, Wonosobo Regency. A total of 59 mothers were selected as samples. We used a total sampling technique, which involved all available participants from the population, as the number of posyandu mothers could be managed. This approach ensures that the sample is fully representative of the target population (25).

## **3 Step**

### **3.1 Dependent variables**

Mother's knowledge about pneumonia in toddlers

### 3.2 Independent Variables

Health education about pneumonia through leaflet media

## 4 Statistical analysis

Data collected from pretest and posttest were analyzed using SPSS software. Data normality was tested using the Shapiro-Wilk test (for a sample size of  $<50$ ) or the Kolmogorov-Smirnov test (for a sample size of  $>50$ ). The significance level of  $p < 0.05$  was used for statistical tests. If the data is distributed normally, the Paired Sample T-Test is applied to assess changes in knowledge levels. For non-parametric data, a Wilcoxon marked rating test is used. The homogeneity of the data distribution was assessed before the hypothesis testing, with a  $p > 0.05$  indicating that the data met the homogeneity assumption.

## 5 Results and discussion

### 5.1 Validity test

In this study, a validity test was carried out which was intended to determine whether the questionnaire was valid or not. By using the number of respondents as many as 30, the  $r$  value of the table can be obtained through the Pearson product moment table with a value of  $n = 30$  with a significance of 5%, then the  $r$  table = 0.361 is obtained. The question item is said to be valid if the value of  $r$  is calculated  $>$  the  $r$  table.

Table 1. Questionnaire Validity Test

Variable	r Calculate	r Table	Result
Question 1	0,000	0,361	Cancel
Question 2	0,503	0,361	Legitimate
Question 3	0,000	0,361	Cancel
Question 4	0,000	0,361	Cancel
Question 5	0,761	0,361	Legitimate
Question 6	0,647	0,361	Legitimate
Question 7	0,490	0,361	Legitimate
Question 8	0,583	0,361	Legitimate
Question 9	0,455	0,361	Legitimate
Question 10	0,493	0,361	Legitimate
Question 11	0,416	0,361	Legitimate
Question 12	0,416	0,361	Legitimate
Question 13	0,416	0,361	Legitimate
Question 14	0,289	0,361	Cancel
Question 15	0,384	0,361	Legitimate

Table 1 shows the results of the validity test on the knowledge questionnaire used. Out of a total of 15 questions, there were 4 questions that were declared invalid because they had an  $r$  value of  $0.361 <$ . So it should be removed from the list of questions. In this study, there are 11 questions that can be used in the questionnaire that will be distributed to respondents.

### 5.2 Reliability test

In this study, a reliability test was carried out by looking at the Alpha Cronbach value, if the Alpha value  $> 0.6$ , then the question which is a variable dimension is reliable. Reliability test data can be seen in table 2

Table 2. Questionnaire Reliability Test

Question	<i>Cronbach alfa</i>	Value	Result
Question 2	0,675	0,6	Reliable
Question 5	0,631	0,6	Reliable
Question 6	0,653	0,6	Reliable
Question 7	0,687	0,6	Reliable
Question 8	0,662	0,6	Reliable
Question 9	0,683	0,6	Reliable
Question 10	0,675	0,6	Reliable
Question 11	0,685	0,6	Reliable
Question 12	0,685	0,6	Reliable
Question 13	0,685	0,6	Reliable
Question 14	0,694	0,6	Reliable

In Table 2. showing the results of the reliability test on the knowledge questionnaire used. Out of a total of 11 questions, all of them are said to be valid because they have a > value of 0.6. So that the results of the 11 questions in the questionnaire used in the research are reliable and can be used for research.

### 5.3 Responsive features

In this study, the number of respondents used was 59 people who were posyandu mothers in Kalibawang District, Wonosobo Regency. The characteristics of the respondents in this study include the age of the respondents, the level of education and the type of work of the respondents. The data on the characteristics of the respondents in this study can be seen in table 3.

Table 3. Respondent characteristics

	Characteristic	Frequency (n=59)	Percentage (%)
Age (years)	18-25	12	20.3
	26-35	35	59.3
	36-45	12	20.3
Education level	SD	15	25.4
	JUNIOR	25	42.4
	Senior High School / Vocational School	13	22
	D3	3	5.1
	S1	3	5.1
Type of work	IRT	53	89.8
	Midwife	4	6.8
	Teacher	2	3.4

Based on Table 3, the distribution of respondent characteristics based on the age of the respondents is the age range of 26-35 years as many as 35 (59.3%) respondents, where the

results obtained are in accordance with the previous research that showed the distribution of age characteristics of respondents of mothers who had toddlers from 92 respondents in the age group of 26-35 years with a total of 30 respondents (32.61%) (9).

The results in Table 3 in this study show that the characteristics of respondents based on the highest level of education are junior high school graduates as many as 25 peoples (42.4%). The results of this study are not in accordance with other studies where respondents of mothers who have toddlers show that the most respondents are high school/vocational school graduates with a total of 41 respondents (44.57%). This is due to the lack of awareness of the importance of schools in the surrounding community so that many do not advance their education to a higher level such as diplomas or bachelor's degrees (9).

The characteristics of respondents based on the type of work were obtained as the most housewives (IRT), namely 53 (89.8%). The results of this study are in line with other studies that show that the mothers who have the most toddlers are IRT workers with a total of 69 respondents (75.0%) (9). This is due to the lack of work for women and the still-inherent tradition where a woman is better at home as a housewife while men work (9).

**5.4 Overview of the effect of leaflet on the level of maternal knowledge about pneumonia as an effort to prevent pneumonia in toddlers**

In this study, it was known that the level of knowledge of respondents was obtained by comparing the knowledge of the respondents before being given an intervention. After the respondents' answers were known before the intervention was given, the respondents' knowledge level was measured. These results will be compared with the respondents' level of knowledge after the intervention.

The intervention given in this study was a leaflet containing an explanation related to pneumonia, then the respondents of this study were given the leaflet individually to read and understand. The researcher also explained the contents of the leaflet to the respondents. And given an opportunity for respondents who want to ask questions related to pneumonia in toddlers. After providing intervention in the form of leaflets to respondents, then fill out a questionnaire to Post-test. Data at a knowledge level Pre-test and Post-test Respondents are seen in Table 4.

Table 4 Knowledge Level Of Pre-Test & Post-Test Respondents

Level of knowledge	Pre-test		Post-test	
	Frequency (n=59)	Percentage (%)	Frequency (n=59)	Percentage (%)
Good knowledge (76-100%)	11	18.6	43	79.2
Enough knowledge (56-75%)	19	32.2	13	22.0
Lack of knowledge (<55%)	29	49.2	3	5.1
<b>Installment (%)</b>		<b>60.9</b>		<b>86.7</b>

Table 4 is the result of the level of knowledge of respondents about pneumonia stated good with a percentage of 18.6% for 11 respondents, sufficient as many as 19 respondents with a percentage of 32.2% and less as many as 29 respondents with a percentage of 49.2%. Based on the results of the pre-test in this study, the majority of respondents had sufficient knowledge (60.9%) about pneumonia in toddlers. In this study, it can be seen that in Table 4 which is the table after the leaflet was given, the results were obtained that the level of

knowledge of good posyandu mothers increased to 43 respondents with a percentage of 72.9%, enough as many as 13 respondents with a percentage of 22%, and less than 3 respondents with a percentage of 5.1%. Based on the results of *the post-test*, there was an increase in respondents' knowledge (86.7%) about pneumonia in toddlers. This result shows that there is an increase in respondents' knowledge by 25.8%.

The results of this study are in line with research conducted at HM May. Ryacudu General Regional Hospital North Lampung showing that the average attitude of parents before health education is 35.87%, then the average attitude of parents after being given health education is 56.87%. So that there is an increase in the level of knowledge by 21% (2) Other research shows that there is an increase in the number of respondents of 8 respondents (13.3%) during *Pre-test* to 24 respondents (40%) during *Post-test* for a good knowledge category (29).

Knowledge will greatly affect a person's behavior. For example, low knowledge about drug abuse can lead to drug abuse behaviors (9). The results of the study stated that the level of adolescent knowledge about the use of OOT (certain group drugs) in East Purwokerto Regency was in the medium category (60%) with adolescent behavior in the good category (52.2%). Good adolescent knowledge can prevent OOT abuse (9).

This is in line with another study where most respondents had good knowledge of 54.2% about the prevention of pneumonia in children under five and showed that a better level of knowledge was positively related to shaping a person's attitude and behavior towards pneumonia prevention (9). Attitudes and behaviors play an important role in the incidence of pneumonia in toddlers. Because with a positive attitude, of course, it will produce behavior of mothers who support the health of their families.

### 5.5 The effect of leaflet media on the level of mother’s knowledge about pneumonia as an effort to prevent pneumonia in toddlers

The initial stage is a normality and homogeneity test to determine the distribution of data. The normality test used the Kolmogorov-Smirnov statistical test for a sample of 59 respondents. The data is said to be distributed normally if the p-value > 0.050. The results of the pre-test p-value normality test of 0.000 < 0.050 and post-test p-value 0.000 < 0.050 were obtained so that it can be said that the data is not normally distributed.

After it was known that the data was not distributed normally, a homogeneity test was carried out. Data is said to be distributed normally if P-value > 0.050. Based on the homogeneity test, it was found that Pre-test and Post-test The data in this study are homogeneous which is characterized by P value from 0.355 > 0.050.

After that, a non-parametric correlation test was carried out to determine the influence of leaflet media on the level of maternal knowledge about pneumonia as an effort to prevent pneumonia in toddlers. In this analysis, the test is carried out using the Wilcoxon statistical test. The Wilcoxon test is one of the non-parametric tests used when the research data is not distributed normally. The data is said to be significant if P value < 0.050 or insignificant > 0.050. The results of this test can be seen in Table 5.

Table 5. The Effect of Leaflet Media on the Level of Mother's Knowledge about Pneumonia as an Effort to Prevent Pneumonia in Toddlers

Knowledge	N	Mean	SD	P value (2 tails)
<i>Previous tests</i>	69	60,9	13,8	0,000
<i>Post tests</i>		86,7	13,6	

Based on the results of the *Wilcoxon* test, a *p-value* of  $0.000 < 0.050$  was obtained for a significant level of 5%, which means that there was a significant difference between the provision of leaflets and the level of knowledge of mothers. Based on this study, it was found that there was an influence between the provision of leaflet media and the level of maternal knowledge about pneumonia as an effort to prevent pneumonia in toddlers in Kalibawang District, Wonosobo Regency.

These results are in line with research conducted in May HM General Hospital. Ryacudu, North Lampung, where the average attitude of parents before health education is 35.87%, then after being given health education is 56.87% and it was found that there is an influence of providing education through leaflet media on parents' attitudes in preventing pneumonia (2) Another study stated that the number of informed respondents increased from 8 respondents (13.3%) to 24 respondents (40%) and the results showed that there was an influence of education about diarrhea using leaflet media on the level of knowledge of mothers in preventing diarrhea in toddlers at the Wonoasih Health Center, Probolinggo (29)

One of the supporting factors in the prevention of pneumonia in children under five is the behavior of mothers under five. One way mothers can prevent pneumonia is by providing health education, through health programs that are able to bring change and increase knowledge in a short time (9). The use of leaflet media is considered more effective in increasing the absorption of health information to the public. The five senses that channel the most knowledge to the brain are the eyes (75%-87%), with leaflet media as a visual aid, information absorption will be better (29).

The use of leaflet media has several advantages, especially in the context of health education. The flyer uses simple and clear language, and is equipped with images or illustrations that help clarify the information. So that it makes leaflets easier to understand by various groups, including someone who still has a low level of education. With these advantages, leaflets become an effective and efficient medium in disseminating health information and increasing public knowledge about various health topics, including pneumonia in toddlers.

Providing a leaflet about health information will help parents understand how to care for their toddler who has pneumonia (4) The existence of health education has an impact on increasing respondents' knowledge, which is the basis for how to behave and take preventive measures against pneumonia, which includes immunization, exclusive breastfeeding, maintaining a smoke-free environment, and getting used to washing hands with soap (9). Low maternal knowledge about pneumonia will cause difficulties in protecting and preventing toddlers from pneumonia transmission (9) .

Pneumonia is one of the leading causes of death in toddlers, especially in developing countries. By increasing maternal knowledge about this disease, it is hoped that the number of diseases and deaths due to pneumonia can be significantly reduced. When mothers gain a good knowledge of pneumonia and apply it in their daily lives, they can also spread this information throughout society.

Good knowledge about pneumonia allows mothers to take appropriate precautions, such as ensuring that children get immunized, maintaining a clean environment, and providing good nutrition. Prevention is better than cure, and with enough knowledge, mothers can prevent their children from developing pneumonia. Mothers who have knowledge of the symptoms of pneumonia can detect the disease early. Early detection is very important because pneumonia can develop quickly and become very serious.

## 6 Conclusion

The conclusion of the study on the significant increase in maternal knowledge about pneumonia in toddlers in Kalibawang District, Wonosobo Regency after the health education

intervention using leaflet media was that before the intervention there was a percentage of 60.9% of respondents with sufficient knowledge and then after that the respondents experienced an increase in knowledge to 86.7% which is classified as good knowledge after the intervention. The results of the statistical analysis obtained a p-value of 0.000 ( $p < 0.05$ ) which confirmed the effectiveness of leaflet media in increasing maternal knowledge about pneumonia prevention. These findings underscore the potential of cost-effective educational tools such as leaflets in empowering caregivers and contributing to public health efforts to reduce pneumonia-related morbidity and mortality in children.

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