

THE EFFECT OF EDUCATION USING LEAFLETS REGARDING ADVERSE EVENTS FOLLOWING IMMUNIZATION (AEFI) FOR DPT-HB-HIB 1 ON MOTHERS KNOWLEDGE LEVELS AT PMB QURRATU AKYUN, JOMBANG REGENCY

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ABSTRACT

DPT-HB-Hib immunization often causes side effects or Adverse Events Following Immunization (AEFI); therefore, mothers need to be informed about these effects to prevent anxiety stemming from a lack of knowledge. This study aimed to analyze the impact of education using leaflets regarding DPT-HB-Hib AEFI on mothers' knowledge levels. A pre-experimental, one-group pre-test and post-test design was employed. The study was conducted on June 21-22, 2026, at the Qurratu Akyun Independent Midwifery Practice (TPMB) in Jombang. Education served as the independent variable, while knowledge was the dependent variable. The study involved a population of 30 participants selected via total sampling. Data analysis was performed using the Wilcoxon Signed-Rank Test. Pre-test results showed that 6 participants (20%) possessed a good level of knowledge, whereas post-test results showed that 19 participants (63.3%) had a good level of knowledge. The Wilcoxon statistical test yielded a p-value of 0.001. The use of leaflets proved effective in enhancing mothers' knowledge due to the medium's visual nature, practicality, and ease of re-reading. This increase in knowledge demonstrates that providing structured information about AEFI can alleviate mothers' concerns, thereby optimizing their compliance and peace of mind regarding future immunization programs.

Keywords: Adverse Events Following Immunization (AEFI), Education, Knowledge

1. INTRODUCTION

DPT-HB-Hib immunization is one of the most effective and efficient preventive measures in reducing infant and child morbidity and mortality due to vaccine-preventable infectious diseases (PD3I). This immunization aims to generate active immunity against diphtheria, pertussis (whooping cough), tetanus toxoid, hepatitis B, and *Haemophilus influenzae* type b. In addition to its benefits, DPT-HB-Hib immunization also causes side effects during its implementation, often referred to as adverse events following immunization (AEFI).¹

An Adverse Event Following Immunization (AEFI) is a medical condition or symptom that occurs after immunization or is suspected to be related to immunization. Adverse Events Following Immunization (AEFI) can occur due to vaccine side effects, toxicity, sensitivity reactions, pharmacological effects, or program errors.²

Indonesian data from 2022 revealed 544 cases of adverse events (AEFI). Some cases were caused by vaccine reactions, while others were caused by vaccination errors.³ Based on the 2018 Basic Health Research data, in Indonesia itself 33.4% of children experienced AEFI and 91.3% of children who received immunization experienced symptoms of redness 20.65%, swelling 220.2%, high fever 6.8% and pus at the injection site 6%.⁴ In 2024, the National Commission on Post-Immunization Adverse Events (Komnas KIPI) received 22,117 reports of non-serious KIPI, 9,910 of which came from East Java Province.⁵

Jombang Regency data shows that out of 306 villages/sub-districts, 224 (73.2%) villages/sub-districts achieved Universal Child Immunization (UCI) in 2023. Meanwhile, the target for Minimum Service Standards (SPM) in the Health Sector in 2023 is 92%.⁶ Based on data on DPT immunization coverage, which is 95.15%, it is still low compared to Polio and Hepatitis B immunization which reached 96.5%.⁶ So it still cannot reach the target, this is caused by

members of the community who refuse immunization. This refusal is caused by the occurrence of KIPI after immunization.

The occurrence of adverse reactions (AEFI) after immunization can cause fear and anxiety among parents. This fear often arises from a lack of information about AEFI. This lack of information reduces parents' knowledge, especially mothers'. Research conducted by Hety Dyah in 2020 showed that nearly half of respondents (15 respondents (41.7%) had inadequate knowledge in managing the signs and symptoms of post-immunization side effects in infants. This was due to a lack of education.⁷

Providing education to mothers is crucial to increase their knowledge and reduce the anxiety they experience if adverse reactions occur after immunization. Research shows that negative perceptions of adverse events (AEFI) significantly influence their decision to complete the basic immunization schedule. Therefore, accurate and clear education about AEFI is crucial so mothers can understand the side effects that may arise after immunization.⁷ A preliminary study conducted at the Qurratu Akyun Child Health Center in January 2026 involved 30 infants receiving the DPT-HB-Hib immunization. Mothers were found to have limited knowledge regarding the signs/symptoms, prevention, and management of AEFI (Adverse Events After Immunization). They stated that they had not received clear and accurate information about the side effects of the immunization.

Based on these issues, researchers are interested in providing education to mothers about AEFI. The education was structured using effective media, including leaflets, guidelines for managing AEFI at home, and contact information for healthcare professionals to help mothers feel more at ease when facing AEFI.

Based on the background above, the researcher is interested in researching "The Effect of Education with Leaflet Media on Post-Immunization Adverse Events (KIPI) DPT-HB-Hib 1 on the Level of Knowledge of

Mothers at PMB Qurratu Akyun, Jombang Regency"

2. METHODS

The design used in this study is a pre-experimental design: one group pre-test and post-test design, namely a research design that measures the condition of the subject before and after being given treatment in the same group, so that the changes that occur can be assumed to be the effect of the intervention.⁸ In this study, researchers examined the level of knowledge of mothers before being given education about KIPI and also the level of knowledge of mothers after being given education about KIPI.

A variable is a behavior or characteristic that assigns a different value to something. There are two variables in this study: the independent variable, which influences or causes changes in or the emergence of the dependent variable.⁹ In this study, the independent variable is education about post-immunization adverse events (AEFI) for DPT-HB-Hib. The dependent variable is the variable influenced by or caused by the presence of the independent variable.⁸ The dependent variable in this study is the level of maternal knowledge about DPT-HB-Hib KIPI.

Population is the entire data source required in a study.¹⁰ The population used in this study was all mothers of babies who were immunized with DPT-HB-Hib 1 at PMB Qurratu Akyun, totaling 30 respondents.

A sample is a portion of the number and characteristics of a population that can be studied and conclusions drawn from.¹¹ The sample of this study was all mothers of babies who were immunized with DPT-HB-Hi 1 at PMB Qurratu Akyun, Jombang Regency.

The sampling technique used in this study was total sampling. Total sampling is a sampling technique where the number of samples is equal to the population.⁸

The instrument used is a questionnaire for general data filled in using a tick (✓) for the appropriate category. For specific data, the maternal knowledge questionnaire used a closed questionnaire containing 20 questions about the definition of AEFI, categories, prevention, types, signs, symptoms, and management of AEFI. The scale used was the

Guttman scale, which requires a firm answer from the respondent. The available answers in this questionnaire are "True" and "False" by providing a check mark (✓) on right or wrong answers.⁹

Data were analyzed univariately using frequencies and percentages. Bivariate analysis was performed using the Wilcoxon Signed Rank test because the data were ordinal. Statistical decision was made if $\alpha = p < 0.05$, interpreted as a significant difference between pre- and post-education scores.

3. RESULT

A. Univariate Analysis

General Data

Respondent Characteristics

N o	Age	Frequen cy (f)	Percentag e (%)
1	< 25	5	16,6
2	25-35	23	76,7
3	> 35	2	6,7
Education			
1	SD	0	0
2	JUNIOR HIGH SCHOOL	2	6,7
3	SMA	11	36,7
4	College	17	56,6
Work			
1	IRT	18	60,0
2	Private	5	16,7
3	Entrepreneur	4	13,3
4	civil servant	3	10,0
Number of children			
1	1 Child	16	53,3
2	2 Children	13	43,4
3	>2 Children	1	3,3
Total		30	100,0

Based on the table above, of the 30 respondents, almost all respondents were aged 20-35 years, namely 23 people (76.7%), and a small number were aged > 35 years, namely 2 people (6.7%).

Based on the table above, the majority of respondents had a higher education background,

namely 17 people (56.6%), and a small proportion had a junior high school education, namely 2 people (6.7%).

Based on the table above, it was also found that out of 30 respondents, the majority of respondents were housewives, namely 18 people (60%) and a small number of respondents were civil servants, namely 3 people (10%).

Based on the table above, of the 30 respondents, most of the respondents have 1 child, namely 16 people (53.3%), and a small number have > 2 children, namely 1 person (3.3%).

Special Data

Mothers' Knowledge Level Before Education with Leaflets on DPT-HB-Hib 1 Adverse Events (KIPI)

Based on the table above Before the education was conducted, almost half of the 30 respondents had poor knowledge, namely 13 people (43%), and a small portion of the respondents had good knowledge, namely 6 people (20%).

Mothers' Knowledge Level After Education with Leaflets on DPT-HB-Hib 1 Adverse Events (KIPI)

No.	Category	Frequency	Percentage (%)
1	Good	19	63,3
2	Enough	9	30
3	Not enough	2	6,7
Total		30	100

Based on the table above, after conducting education, 19 respondents (63.3%) had good knowledge of 30 respondents, while a small number of respondents (2) had poor knowledge of 30 respondents.

B. Analysis Bivariate

Mother's Knowledge Level									
	Total Data Statistics					Category			Total
	Mean	Score Lowest	Highest Score	Median	Standard Deviation	Good (%)	Enough (%)	Not enough (%)	
Pretest	12,63	7	20	13	3,90	6 (20)	11 (37)	13 (43)	30
Posttest	15,73	8	20	16	2,74	19 (63,3)	9 (30)	2 (6,7)	30
Wilcoxon test n-value 0.001 and Z value or Effect Size = 4.310									

Wilcoxon test p-value 0.001 and Z value or Effect Size - 4.310

Based on the table above, it is known that before being given education, out of 30

respondents, almost half of them had a knowledge level of Poor (13%, 43%). And a small portion of respondents had Good knowledge, namely 6 (20%). With the lowest score being 7 and the highest score being 20. The average score (mean) was 12.63.

Meanwhile, after being given education, the majority of 30 respondents (19 respondents) had a good level of knowledge, followed by 9 respondents (30%) with a fair level of knowledge, and 2 respondents (6.7%) with a poor level of knowledge. With the lowest score being 8 and the highest score being 20. The average score (mean) was 15.73.

No.	Category	Frequency	Percentage (%)
1	Good	6	20
2	Enough	11	37
3	Not enough	13	43
Total		30	100

The results of the Wilcoxon statistical test on the variable obtained a p value of 0.001 ($\alpha < 0.05$), so it can be concluded that there is an influence of education using leaflet media on the level of mothers' knowledge about KIPI DPT-HB-Hib 1 at PMB Qurratu Akyun Jombang.

4. DISCUSSION

A. Identifying the Level of Mothers' Knowledge Before (Posttest) Being Given Education Using Leaflets on Post-Immunization Adverse Events (KIPI) DPT-HB-Hi 1 at PMB Qurratu Akyun Jombang

Based on the results of a study conducted on 30 respondents at the Qurratu Akyun Student Learning Center in Jombang Regency, it was found that before receiving education (pre-test), almost half of the respondents had a low level of knowledge, namely 13 (43%). And only a small portion of respondents were in the Good category, namely 6 (20%). This lack of knowledge, according to several theories, is generally influenced by the characteristics of the respondents.¹¹ Where most new mothers have one child (primipara), so direct experience regarding the handling of Post-Immunization Adverse Events (KIPI), especially with the DPT-HB-Hib 1 vaccine, is still very minimal.¹¹ And based on education level, the majority of respondents with less knowledge had a high school education. This is because the theory states that the higher a person's education, the easier it is for them to obtain information.¹¹

This lack of knowledge among respondents could also be caused by the limited sources of information they had obtained. Consistent with previous research, prior to intervention, mothers' information was based solely on inaccurate, inherited stories or a lack of structured explanations from healthcare providers. This often led to excessive anxiety among mothers when their babies experienced AEFI symptoms.¹¹ Based on the research results, almost half of the respondents did have sufficient knowledge, but there were still several aspects of knowledge that were not yet optimally understood. The educational

background of respondents, who were predominantly university graduates, was assumed to make it easier for respondents to absorb education regarding DPT-HB-Hib 1 AEFI. Meanwhile, the dominant status of housewives (IRT) provided flexibility in time for respondents to examine educational materials, which according to Mubarak et al. (2013), allowed mothers to focus more on the health of their children and families.

Therefore, more in-depth education is needed for mothers using leaflets. Attractive and non-monotonous visuals are expected to make respondents want to know the contents of the images, which can help them absorb the information..

B. Identifying the Level of Mothers' Knowledge After (Posttest) Education with Leaflet Media about Post-Immunization Adverse Events (KIPI) DPT-HB-Hi 1 at PMB Qurratu Akyun Jombang

After the education, the research results showed a significant increase in mothers' knowledge levels after being provided with education using leaflets. Before the intervention (pre-test), almost half of the respondents were in the Poor category, namely 13 (43%). However, after the intervention (post-test), only a small portion of respondents had Poor knowledge, namely 2 (6.7%). The level of knowledge in the Good category increased significantly, to 19 respondents (63.3%).

This increased knowledge includes understanding, frequency of administration, signs of reactions, impacts, and handling of DPT-HB-Hib 1 AEFI. The results of other studies also show that 1 month of education using leaflets can increase the knowledge of adolescent girls regarding anemia with a p value of 0.000.¹²

Improving knowledge about immunization and adverse events (AEFI) is essential for building maternal confidence and reducing post-immunization anxiety in infants. This successful improvement reinforces the evidence that leaflets are effective in providing new insights to respondents, as the information presented is more concise and easier to understand.

The increase in respondents' knowledge after receiving education in this study indicates that the information presented was well received and understood by them. The use of attractive leaflets can make it easier for respondents to accept the information provided..

C. Analyzing the Effect of Education with Leaflet Media on Post-Immunization Adverse Events (KIPI) DPT-HB-Hi 1 on the Level of Mothers' Knowledge at PMB Qurratu Akyun Jombang

Based on the results of data analysis using the Wilcoxon Signed-Rank Test, it provides an overview of changes in respondents' knowledge levels between before (pre-test) and after (post-test) education was given. Based on the results of the analysis of 30 respondents, no respondents experienced a decrease in scores from pre-test to post-test. The mean rank and sum of ranks for this group was 0.00. There were 24 respondents who experienced an increase in scores (post-test scores were higher than pre-test). This group had a mean rank value of 12.50 with a total rank (sum of ranks) reaching 300.00. The mean rank and sum of ranks for this group were 0.00. A total of 6 respondents had the same score between pre-test and post-test (no change or increase in knowledge).

Of the 30 respondents, the data showed very positive results. The vast majority (24) experienced an increase in their scores after receiving education, indicating that the intervention

significantly improved their knowledge levels. The absence of a decrease in scores (Negative Ranks = 0) further confirms that the media-based education was highly effective in providing new insights to respondents..

Based on the statistical test, the significance value of the p-value is $0.001 < 0.05$ and the Z value is -4.310, so there is a significant difference between the level of knowledge before and after being given education, which means there is an influence on the pretest and posttest results on mothers at PMB Qurratun Akyun Jombang.

In line with research by Nursyamsiah in Delvia's thesis (2024), it also shows that the average value of knowledge before education was carried out using leaflet media, the mother's knowledge was obtained. The result was 11.60, and after education, it increased to 13.95. Other research has also shown that education using leaflets can increase knowledge.

The success of this knowledge increase demonstrates that the educational leaflet media used by the researchers is an effective tool in conveying information to respondents clearly and easily understood. Health education using printed media such as leaflets can significantly change a person's level of knowledge from the poor/adequate category to the good category. The leaflets the researchers created presented information with attractive and easy-to-understand visuals and summaries. The researchers also delivered and explained the information directly to respondents, making it easier for them to absorb the information.

In line with the theory that the use of leaflet media is now starting to be used frequently along with technological developments because visual media offers more interesting and non-

monotonous education so that respondents are interested in reading.¹²

The role of health workers is equally important. Health workers act as educators, providing accurate information, tailored to the mother's social context, age, and education level, so that the immunization program can be followed sustainably, safely, and comfortably. By increasing maternal knowledge, mothers' concerns and trauma regarding side effects after immunization will decrease. Maternal compliance with immunization will also improve, thereby achieving immunization program coverage..

The above assumption is supported by the opinion of Notoatmodjo 2014, namely that health education or health education has a great influence on a person's knowledge because educational activities are carried out by spreading messages, instilling beliefs so that people not only know and understand but can also carry out existing recommendations.

5. CONCLUSION

Based on the research results, it can be concluded that there is a significant effect of providing education using leaflets about DPT-HB-Hi 1 AEFI on the level of knowledge of mothers at the Qurratu Akyun PMB in Jombang Regency. This is proven by the Wilcoxon Signed-Rank Test, where 24 respondents (80%) experienced an increase in knowledge scores without any respondents experiencing a decrease in scores, with a p-value of 0.001.

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