

The Relationship Between Mothers' Knowledge About Post-Immunization Adverse Events (KIPI) And Dpt Immunization Provision At The Serasi Pratama Clinic In Medan In 2026

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ABSTRACT

DPT immunization, which protects against diphtheria, pertussis, and tetanus, was an important preventive measure against infectious diseases among infants and young children. However, some mothers remain hesitant to have their children receive DPT immunization due to insufficient knowledge regarding Adverse Events Following Immunization (AEFI). Adequate knowledge of AEFI was considered important in increasing maternal confidence in following the recommended immunization schedule. Objective: This study aimed to determine the relationship between maternal knowledge of AEFI and DPT immunization administration at Serasi Primary Clinic, Medan, in 2026. Method; A cross-sectional approach was employed in this study. The study population consisted of all mothers who visited Serasi Primary Clinic, Medan, to have their children receive DPT immunisation, consisting of 41 mothers. Total sampling was used; therefore, the entire population of 41 mothers was included as the study sample. Data on maternal knowledge were collected using a questionnaire, while information regarding DPT immunization administration was obtained through observation of the Maternal and Child Health (MCH) book. Result; The results of the Chi-square test showed a p-value of 0.000 ($p < 0.05$), indicating a statistically significant relationship between maternal knowledge of AEFI and DPT immunization administration at Serasi Primary Clinic, Medan, in 2026. Conclusion; Mothers with better knowledge of AEFI were more likely to have their children receive DPT immunization according to the recommended schedule. Therefore, healthcare professionals were encouraged to strengthen educational interventions concerning AEFI in order to increase maternal understanding and improve DPT immunization coverage.

Keywords: Maternal Knowledge, Adverse Events Following Immunization (AEFI), DPT Immunization.

INTRODUCTION

World Health Organization The U.S. government has set a target of complete basic immunization coverage, including DPT-HB-Hib, of at least 90% nationally and 80% in each administrative region. However, a number of countries, especially in Sub-Saharan Africa, South Asia, and parts of Southeast Asia, have not yet achieved this target due to limited access to health services, conflict, obstacles to vaccine distribution, and low

public awareness. Of the 88 countries with household survey data from 2014–2023, only 27 recorded DTP3 coverage of 90% or more, while 29 others were below 70%.(1). In Indonesia, immunization coverage for 2023 reached the national target of 88%, but 544 cases of Adverse Events Following Immunization (AEFI) were still found, some of which were caused by mothers' misunderstanding of the DPT immunization schedule. Immunization programs have been implemented in Indonesia since 1956 and were expanded into the Immunization Development Program in 1977, while Law Number 36 of 2009 concerning Health affirms the right of every child to receive basic immunizations. However, by mid-December 2025, national coverage of complete infant immunization had only reached 68.6%, demonstrating the need for accelerated and equitable distribution of immunization services.(2)At the provincial level, North Sumatra data shows that DPT immunization coverage for children under two years old is 74.97%, with quite wide disparities between regions.(3).

One of the factors that contributes significantly to low immunization coverage is parental concern about AEFI, which according to Minister of Health Regulation No. 12 of 2017 is influenced by personal experiences, experiences of the surrounding environment, and the spread of inaccurate information through social media.(4)Other reasons why babies do not receive complete immunizations include concerns about fever, family non-permission, distance to the immunization site, and not knowing the location of the service.(5). Incomplete basic immunization due to a lack of parental knowledge can increase the morbidity rate due to vaccine-preventable diseases (PD3I), including diphtheria, pertussis, and tetanus.(6).

Adverse Events (AEFI) are defined as medical events in the form of illness or death that occur after immunization and are suspected to be related to the vaccine given; they are generally temporary and mild, and can be treated with cold compresses on the injection site or warm compresses accompanied by rest if accompanied by fever.(7). Research by Wahyuningsih, Prihandani, and Kurniati found a significant relationship between mothers' knowledge about DPT KIP and compliance with basic immunization in toddlers.(8).

Mothers' knowledge plays an important role in the decision to take their babies for immunization according to schedule; mothers who do not understand the benefits and risks of immunization properly tend to pay less attention to their children's immunization schedule.(9). Mothers' lack of knowledge about AEFI can lead to excessive worry about side effects, causing mothers to delay or refuse to take their

children for immunization.(10)This is exacerbated by the lack of intensive outreach from health workers and the low level of mother's activity in seeking information, which ultimately makes children more vulnerable to diseases that are actually preventable.(11).

DPT immunization is specifically aimed at building immunity against diphtheria, pertussis, and tetanus using toxoid vaccines.(12), which is given as three basic doses at 2, 3, and 4 months of age with a booster at 18 months of age(13).

The side effects that may arise are divided into mild reactions in the form of fever, redness, and pain at the injection site, to severe reactions such as encephalopathy and anaphylactic shock, although severe reactions are very rare.(14)Post-immunization fever is categorized as a fever if the body temperature exceeds 37.5°C and generally improves within 1–2 days.(15).

AEFI more broadly includes medical events related to program errors, injection reactions, vaccine induction, coincidental factors, or unknown causes.(16).

This classification is important for distinguishing reactions caused purely by the vaccine from reactions resulting from technical errors in the immunization process. Knowledge itself is the result of a person's understanding of an object, acquired through education and experience.(17)influenced by internal factors such as age and gender, as well as external factors such as education, work, sources of information, and socio-cultural environment(18).

Knowledge can be obtained in various ways, ranging from tradition, authority, logical reasoning, experience, to trial and error methods.(19), and measured using standardized instruments with categories of good, sufficient, and less based on the percentage of correct answers(20).

Several previous studies reinforce the urgency of this topic. Mayang Sari's study of infants aged 0–24 months found a significant association between mothers' knowledge and attitudes and adverse reactions (AEFI) following DPT immunization ($p=0.000$). (11)Hasriani's research at the Sarappo Community Health Center in Pangkep Regency showed a relationship between maternal perception and the incidence of adverse events (AEFI) ($p=0.003$). (18)Merlia's research in Bengkulu City proved that the better the mother's knowledge, the more appropriate the post-DPT-HB-Hib immunization treatment ($p=0.000$). (5)Syahwandi's research in the North Siantan Community Health Center work area also confirmed the relationship between maternal knowledge about AEFI and the administration of DPT immunization to toddlers

($p=0.002$). (4). In line with this, research by Damanik, Siregar, and Simbolon found a strong and positive correlation between maternal knowledge about AEFI reactions and the act of administering DPT immunization ($p=0.000$; $r=0.577$). (10).

A preliminary survey of 10 mothers at the Serasi Primary Clinic in Medan revealed that eight mothers did not understand the benefits of immunization and the risks of not immunizing their children. Six mothers were concerned about the side effects of DPT immunization, while two others believed immunization was not mandatory. These findings formed the basis for analyzing the relationship between maternal knowledge about adverse events (AEFI) and DPT immunization at the Serasi Primary Clinic in Medan in 2026.

RESEARCH METHODS

This study uses an observational analytical design with a cross-sectional approach, namely a design that measures independent variables and dependent variables at the same time without providing treatment or intervention to respondents. (16) The study was conducted at the Serasi Primary Clinic, Jl. Pantai Timur, Medan, in January–August 2026.

The population in this study was all mothers who had babies and visited the Serasi Medan Primary Clinic for DPT immunization, namely 41 people. (16). Sampling was carried out using the total sampling technique, so that all members of the population, amounting to 41 mothers, were used as research samples.

Primary data was obtained through questionnaires completed directly by mothers of infants to measure their knowledge of AEFI. Secondary data was obtained from KIA/KMS books or immunization records at health care facilities to determine the completeness of DPT immunizations. Tertiary data was obtained from published documentation, such as data from the World Health Organization, the Indonesian Ministry of Health, and the North Sumatra Health Profile. (15).

The research instrument, a knowledge questionnaire consisting of 10 statement items, was tested for validity and reliability before use. The validity test aims to determine the accuracy of the measuring instrument in measuring the intended variables, with the provision that an item is declared valid if the calculated r value is greater than the table r value. (16). The validity test results show that all 10 statement items are valid, with calculated r values ranging from 0.381 to 1.000, greater than the table r of 0.361 at a

significance level of 5%. The reliability test produced a Cronbach's Alpha value of 0.969, which is above the minimum limit of 0.70, so the instrument is declared reliable and suitable for use as a data collection tool.

Data processing was carried out computerized through five stages, namely collecting (collecting data from questionnaires and observation sheets), checking (checking the completeness of answers to avoid bias), coding (assigning codes to each variable), entering (entering data into a computer program), and data processing (processing data according to analysis needs).

Data analysis was conducted in two stages. Univariate analysis was used to describe each research variable; the maternal knowledge variable was presented in frequency distributions and percentages of the categories good, sufficient, and insufficient, while the DPT immunization variable was presented in frequency distributions and percentages of the categories complete and incomplete.(17)Bivariate analysis was conducted to test the relationship between the independent and dependent variables using the chi-square statistical test at a 95% confidence level ($\alpha = 0.05$). Variables are declared to have a significant relationship if the p-value ≤ 0.05 , whereas if the p-value ≥ 0.05 , it is concluded that there is no significant relationship between the two variables.

RESEARCH RESULT

1. Characteristics of Respondents at Serasi Primary Clinic

Respondent characteristics in this study included age, occupation, and education. Based on the results of the study, which was conducted on 41 mothers, Serasi Primary Clinic MedanThe year 2026 is presented in Table 1.

Table 1. Distribution of Characteristics of Age, Occupation, and Mother's Education at the Serasi Primary Clinic in Medan

No	Variables	n	Percentage (%)
Age			
1.	<25 Years	13	31.7
2.	26-35 Years	17	41.5
3.	>35 Years	11	26.8
Total		41	100
Work			
		n	Percentage (%)

No	Variables	n	Percentage (%)
Age			
1.	Housewife	21	51.2
2.	Self-employed	13	31.7
3.	civil servant	7	17.1
Total		41	100
Education			
1.	Base	4	9.9
2.	Junior high school	23	56.1
3.	PT	14	34
Total		41	100
What order do you come in your family			
1		10	42.4
2-3		17	41.5
>3		14	34.1
Total		41	100

Based on table 1, it shows that the majority of mothers are aged 26-35 years, namely 17 (41.5%), the majority of mothers work as housewives, namely 21 (51.2%), the majority of mothers have secondary education, namely 23 (56.1%), and the majority of mothers currently have 2-3 children, namely 17 (41.5%).

2. Univariate Analysis

Univariate analysis aims to determine the distribution of respondents' answers to variables based on research problems which are outlined in the frequency distribution table technique. presented in Table 2.

Table 2. Frequency Distribution of Mothers' Knowledge About AEFI and DPT Immunization at Serasi Primary Clinic, Medan

No.	Variables	Frequency	Percentage (%)
Mother's Knowledge			
1.	Good	6	14.6

2.	Enough	16	39
3.	Good	19	46.4
Total		41	100
DPT Immunization Administration			
1.	Complete	16	39
2.	Incomplete	25	61
Total		41	100

Based on table 2, it shows that of the 41 respondents, the majority had good knowledge, as many as 6 (14.6%) mothers, sufficient knowledge as many as 16 (39%) mothers and those who had poor knowledge as many as 19 (46.4%) mothers, the majority of DPT immunizations were complete, as many as 16 (39%) babies and incomplete as many as 25 (61%) babies.

3. Bivariate Analysis

The bivariate analysis was conducted to determine whether there was a relationship between the independent variable, namely maternal knowledge about post-immunization adverse events (AEFI), and the dependent variable, DPT immunization administration. This analysis was conducted using statistical testing, namely the chi-square test.

Table 3. Crosstabulation of the Relationship between Mothers' Knowledge of Adverse Events (KIPI) and DPT Immunization

Knowledge	DPT Immunization				Amount	<i>P (sig)</i>	
	Administration						
	Incomplete		Complete				
	f	%	f	%			
Good	1	2.4	5	12.2	6	14.6	0,000
Enough	5	12.2	11	26.8	16	39	
Not enough	19	46.4	0	0	19	46.4	
Total	25	61	16	39	41	100	

Based on table 3, it was found that mothers with insufficient knowledge gave incomplete DPT immunization to 19 babies and mothers with insufficient knowledge gave no babies complete DPT immunization, mothers with sufficient knowledge gave incomplete DPT immunization to 5 babies and complete DPT immunization to 11 babies, while mothers with good knowledge gave incomplete DPT immunization to 1 baby and complete DPT immunization to 5 babies. From the results of the chi square test, the p value was obtained at 0.000 which is smaller than (<0.05), which means There is a Relationship Between Mothers' Knowledge of Post-Immunization Adverse Events (KIPI) and the Administration of DPT Immunization at the Serasi Primary Clinic in Medan in 2026.

DISCUSSION

Based on table 3, it is known that the majority of respondents had insufficient knowledge of 19 people (46.4%), and a minority had good knowledge of 6 people (14.6%) with a p value of 0.000 smaller than (<0.05). This shows that the number of incomplete immunizations in mothers with insufficient knowledge is greater than the number of incomplete immunizations in mothers with sufficient and good knowledge. Knowledge is a very important thing in shaping a person's behavior. The level of knowledge possessed by mothers will provide a positive response. The knowledge possessed by mothers will have a positive influence on the decision-making and behavior of mothers to immunize their babies. Mothers who have high knowledge will have a greater opportunity to immunize their babies.

Based on these results, mothers' knowledge about basic immunization can influence their behavior in administering immunizations. The results of this study are in accordance with the theory put forward by Notoatmodjo, which states that knowledge is a very important domain in the formation of behavior and this behavior is determined by predisposing factors, namely factors that can facilitate or predispose the occurrence of behavior in an individual or society, namely the knowledge and attitudes of an individual or society.(4).

According to Notoatmodjo, the method of acquiring knowledge is a non-scientific method (trial and error, coincidence, power or authority, based on personal experience, common sense, truth through revelation, institutionally, through the mind, induction, deduction), while the scientific method is a new or modern way of acquiring

knowledge today that is more systematic, logical, and scientific. This method is called the scientific research method, or more popularly known as the research method.(4).

This research is in line with the research conducted by Syahwandi (2025) with the title The Relationship between Mother's Knowledge about Post-Immunization Adverse Events (KIPI) and the Provision of DPT Immunization to Toddlers in the Work Area of the North Siantan Health Center. Based on the results of the chi square test, the results obtained were with a value of $p = 0.002$ ($p < 0.05$), which means there is a relationship between mother's knowledge about post-immunization adverse events and the provision of DPT immunization to toddlers in the work area of the North Siantan Health Center.(4).

This research is also in line with the research conducted by Pebiola (2024) with the title The Relationship Between Mother's Knowledge and Handling of Post-Immunization Adverse Events (KIPI) at Pmb Heni, Cipaeh Village, Gunung Kaler Village, Tangerang Regency. From the results of the chi-square test, the p value (0.004) $< \alpha$ (0.05) was obtained, this indicates that there is a significant relationship between knowledge and handling of KIPI.(19).

A similar study was also conducted by Mayang Sari (2025) with the title The Relationship between Knowledge and Attitude of Mothers to Adverse Events Reactions Following DPT Immunization in Infants 0-24 Months: A Cross Sectional Study. The results of this study showed a significant relationship between the knowledge of mothers of toddlers to adverse reactions. The attitudes of mothers of toddlers to adverse reactions with DPT immunization. With the results of Chi-square analysis showing a significant relationship between the knowledge of mothers of toddlers to adverse reactions (p -value = 0.000). As well as the attitudes of mothers of toddlers to adverse reactions (p -value = 0.000). Knowledge and attitudes towards adverse reactions have a significant relationship with DPT immunization. It was concluded that there is a relationship between knowledge and attitudes about adverse reactions to immunization in providing DPT immunization. For this reason, it is hoped that health workers can increase DPT and adverse reactions so as to minimize negative perceptions of DPT and adverse reactions to immunization.(11).

Researchers assume that maternal knowledge is one of the factors related to the completeness of DPT immunization for infants. Lack of knowledge about the benefits of immunization and Post-Immunization Adverse Events (AEFI) can raise concerns about the side effects of immunization, potentially influencing mothers' decisions to immunize their infants. However, the study also showed that one mother with good knowledge had not yet received the complete DPT immunization. This indicates that immunization completeness is not only related to knowledge but can also be influenced

by other factors, such as employment status and limited time to access immunization services. Therefore, efforts to increase immunization coverage need to be accompanied by appropriate education and support for access to services that make it easier for mothers to fulfill their infants' immunization schedules.

CONCLUSION

From the research results obtained in the study, it can be concluded that:

1. Frequency distribution of mothers' knowledge about post-immunization adverse events (KIPI) of 41 respondents, most of the respondents had insufficient knowledge about post-immunization adverse events (KIPI), namely 19 people (46.4%).
2. The distribution of the frequency of DPT immunization at the Serasi Medan Primary Clinic in 2026 from 41 respondents showed that the majority were incomplete, namely 25 babies (61%).
3. There is a relationship between maternal knowledge about post-immunization events (KIPI) and the provision of DPT immunization at the Serasi Medan Primary Clinic in 2026 from 41 respondents showing the results of the statistical test $p\text{-value} = 0.000$ which means $p\text{ value} < 0.05$ so that there is a significant relationship between maternal knowledge about post-immunization events (KIPI) and the provision of DPT immunization at the Serasi Medan Primary Clinic in 2026.

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