



The Relationship Between Mothers' Knowledge and Perception Level About Basic Immunization and Compliance with Basic Immunization to Infants at Wairoro Public Health Center

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Abstract: High infant mortality rates are a major health problem worldwide, especially in developing countries. To protect people from serious and infectious diseases, immunization is the most affordable and effective way to prevent primary infection. The more mothers know about how to provide their children with complete basic vaccinations, the greater their awareness of it. Parents can choose to provide their children with complete basic immunizations through their perceptions. The purpose of this study was to determine mothers' knowledge and perceptions about their babies' compliance with basic immunizations. This study was designed as a cross-sectional study. This study involved 91 respondents, and data collection was obtained using purposive sampling. The results showed that the best respondents in the good category had knowledge of basic immunizations, as many as 52 respondents (57.1%), the best respondents in the positive category had knowledge of basic immunizations, as many as 76 respondents (83.5%), and the best in compliance with basic immunizations were 78 respondents (85.3%). There is a correlation between the level of knowledge about basic immunization and compliance to provide basic immunization to infants in the working area of the Wairoro Community Health Center, South Weda District with a *p* value of 0.000. In addition, there is a correlation between perceptions about basic immunization and compliance to provide basic immunization to infants in the working area of the Wairoro Community Health Center, South Weda District. To find out other factors that influence compliance with basic immunization, it is recommended to conduct further research that includes more samples, different research designs, and different variables.

Keywords: Compliance; Immunization; Infant mortality; Knowledge; Perception.

1. INTRODUCTION

Child health in developing countries is a major health problem. The infant mortality rate (IMR) is quite high worldwide. (UNICEF, 2019) states that the global infant mortality rate is nearly 10 million deaths. Improving infant health is crucial because infants and children are the nation's future generation. Efforts to address this issue aim to create a healthy generation by reducing child morbidity and mortality rates. This requires consistent efforts and commitment to health (Soetjiningsih, 2017).

Immunization, as a highly effective and affordable primary prevention measure for infectious diseases, protects individuals not only from serious illnesses but also from communicable diseases (Prayogo et al., 2016). Effective and efficient efforts to reduce child morbidity and mortality can improve national health by preventing six deadly diseases: tuberculosis, diphtheria, pertussis, measles, tetanus, and polio. The World Health Organization (WHO) has developed the Expanded Program on Immunization (EPI) to increase immunization coverage for children worldwide (Ayubi, 2019).

Data from UNICEF (2018) shows that the global live birth rate was 139,677,000, with a population of 7,586,000,000 infants. Of these, 135,636,000 survived, including 16,651,000

diphtheria cases, 153,631,000 pertussis cases, 104,000 polio cases, and 15,103,000 tetanus cases. Based on this data, the target population vaccinated was 89% with BCG, 90% with DTP 1, 86% with DTP 3, 42% with Hep, 72% with Hib 3, and 85% with Pol 3, meaning the vaccination target has not yet reached 100% (UNICEF, 2019).

Baseline immunization coverage in Indonesia has consistently been above 85% over the past five years, but has not yet reached the Ministry of Health's Strategic Plan target. In 2018, complete basic immunization coverage in Indonesia was 90.61%, still below the 2020 Strategic Plan target of 92.5% (Ministry of Health of the Republic of Indonesia, 2019). In Riau Province, immunization coverage was 85.46%, still falling short of the 2020 Strategic Plan target of 92.5% (Riau Health Office, 2020). Based on data from Indragiri Hulu Regency in 2019, immunization coverage was 93.56% of the target of 95% for a total of 5,950 infants (Indragiri Hulu Regency Health Office, 2021). At the Wairoro Community Health Center in Weda Selatan District, 91.5% of 1,071 infants received immunizations, still falling short of the 95% target (Rakit Community Health Center, 2021).

Morbidity and mortality from tuberculosis, poliomyelitis, measles, hepatitis B, diphtheria, pertussis, and neonatal tetanus have increased due to incomplete immunizations. Incomplete basic immunizations can be caused by parents' lack of knowledge about the importance of basic immunizations to prevent disease in infants. Infants receiving incomplete basic immunizations may indicate that parents are not following their child's basic immunization schedule, meaning the child lacks or is not immune to vaccine-preventable diseases (Undarti, Murtutik, & Suwarni, 2013).

Research has shown this is due to mothers' lack of knowledge about the benefits and importance of providing complete basic immunizations to children, as well as a lack of public awareness regarding the importance of early prevention of infectious/communicable diseases in children by providing complete basic immunizations. This is also influenced by various reasons often cited by some communities, such as the belief that children who are not immunized are still healthy and never experience serious illnesses, even though children should be immunized from birth to prevent certain diseases (Dwi Mardiah Safitri, Yufitriana Amir, 2017).

According to research by Prihanti, Rahayu, & Abdullah, 2016, knowledge is defined as the understanding of a set of information and the objective recognition of an object or thing. Experience and the results of formal and informal learning are also sources of knowledge. According to (Dillyana, 2019), mothers' awareness of providing complete basic immunizations to their children is positively correlated with their knowledge. A study conducted by

(Kusumaningrum & Komalawati, 2022) found a significant relationship between mothers' knowledge of how to receive the right vaccinations and their knowledge of how to receive the right vaccinations. This is in line with research conducted by (Undarti et al., 2013), which found a correlation between mothers' knowledge of basic immunizations and infants' compliance with basic immunizations.

Knowledge factors relate to a person's perception of how easy or difficult it is to initiate a behavior. Factors such as the social and cultural environment, health services, previous experiences, needs, and motivations, among others, influence a person's perspective. Perceptions will determine a parent's decision to provide their child with complete basic immunizations (Fadlilah & Rahil, 2019).

The Indragiri Hulu Regency Government has the Wairoro Community Health Center (Puskesmas) in South Weda District, located in Wairoro District, South Weda District. The rate of refusal of basic immunizations at the Wairoro Community Health Center in South Weda District remains quite high, at more than 5% in each sub-district. Those who refuse basic immunizations are those who have not received one or more of the following basic immunizations: four doses of Hepatitis B, one dose of BCG, three doses of DPT, four doses of Polio, and one dose of Measles. The polio coverage rate at the Wairoro Community Health Center in Weda Selatan District is 92.9% (Indragiri Hulu Regency Health Office, 2021).

The Wairoro Community Health Center in Weda Selatan District is one of the government-owned health services in Indragiri Hulu Regency, located in the Wairoro District of Weda Selatan. Within the Wairoro Community Health Center's coverage area, the basic immunization dropout rate in each sub-district remains quite high, exceeding 5%. A basic immunization dropout refers to incomplete immunization, meaning the child has not received one or more of the following immunizations: four doses of Hepatitis B, one dose of BCG, three doses of DPT, four doses of Polio, and one dose of Measles. While the overall immunization coverage in the Wairoro Community Health Center's coverage area has met the target, some sub-districts still fall below the target, reaching less than 95%. Only measles immunization has not met the UCI target of 89.6%. Coverage for Hb immunizations less than 7 days is 92.8%, BCG is 92.8%, measles is 89.6%, DPT-Hb-Hib is 93.9%, and polio is 92.9% at the Wairoro Community Health Center in South Weda District (TPTD PKM Kulim data, 2023).

Based on a preliminary survey conducted at the Wairoro Community Health Center in South Weda District, a lack of information sources, such as brochures or posters, related to immunization was found. This can also contribute to mothers' lack of knowledge about vaccination. Interviews with mothers at the integrated health post (Posyandu) indicated that

many mothers still do not know the benefits, timing, and types of vaccines to give their babies. Therefore, research on the relationship between mothers' knowledge and perceptions about basic immunizations and immunization compliance is crucial.

The Wairoro Community Health Center in South Weda District has undertaken various efforts to improve basic immunization coverage for infants. These include counseling, providing immunizations to toddlers in the community health center area, and encouraging their babies to receive their immunizations according to the schedule. The researchers' investigation found that mothers who brought their babies to the Wairoro Community Health Center in South Weda District did not understand the importance of providing complete immunizations to their babies. According to the mothers of toddlers, they only knew that vaccinations were given whenever possible.

Based on this situation, the researchers conducted a study to determine the "Relationship between mothers' knowledge and perceptions about basic immunizations and compliance with basic immunizations for infants in the Wairoro Community Health Center work area in South Weda District."

2. RESEARCH METHOD

The sample size for this study was 91 respondents. This quantitative research was conducted in the form of an analytical survey using a cross-sectional method. In this type of research, the measurement time for the independent and dependent variables was focused on a single encounter with a patient. According to Nursalam (2017), this research aims to identify the effects or prevalence of a phenomenon and its relationship to its causes. This study investigated the relationship between mothers' knowledge and perceptions of basic immunization and their infants' compliance with basic immunization at the Wairoro Community Health Center in South Weda District. Data were collected using a questionnaire and processed for univariate and bivariate analysis.

3. RESULTS AND DISCUSSION

Univariat Analysis

Table 1. Respondent Characteristics.

Age	Frequency	Persentase
15-25 years	10	10.98
26-35 years	52	62.63
36-42 years	29	31.8
Total	91	100
Pendidikan	Frekuensi	Persentase
Elementary Scholl	8	8.79
Junior High School	54	59.34
Senior High School	20	21.97
Bachelor	9	9.9
Total	91	100
Occupation	Frekuensi	Persentase
Housewife	78	85.71
Government employees	5	5.50
self-employed	8	8.79
Total	91	100

Based on Table 1 above, the majority of respondents (52) were aged 26-35 years (62.63%). The majority (54) had a junior high school education (59.34%). The majority (54) had a junior high school education (59.34).

Table 2. Analysis of Knowledge About Basic Immunization in Infants in the Work Area of the Wairoro Community Health Center, South Weda District.

No	Category	Amount	Persentase (%)
1	Good	52	57,1
2	Enough	27	29,7
3	Less	12	13,2
Total		91	100,0

Based on table 2, the majority of respondents had good knowledge, namely 52 respondents (57.1%).

Table 3. Perception Analysis of Basic Infant Immunization in the Work Area of the Wairoro Community Health Center, South Weda District.

No	Category	Amount	Persentase (%)
1	Negatif	15	16,5
2	Positif	76	83,5
Total		91	100

Based on table 3, the majority of respondents have a positive perception, namely 76 respondents (83.5%).

Table 4. Analysis of Compliance Regarding Basic Infant Immunization in the Working Area of the Wairoro Community Health Center, South Weda District

No	Category	Amount	Persentase (%)
1	Not obey	13	14,3
2	Obey	78	85,7
Total		91	100

Based on table 4, the majority of respondents have compliance in the compliant category, namely 78 respondents (85.3%).

Table 5 Relationship between the Level of Knowledge about Basic Immunization and Compliance with Basic Immunization for Infants in the Working Area of the Wairoro Community Health Center, South Weda District.

Knowledge	Compliance		Yes		Total		p Value
	No						
	f	%	F	%	f	%	
Less	8	15	4	11	12	13	0,000
Enough	18	33	9	24	27	30	
Good	28	52	24	65	52	57	
Total	54	100	37	100	91	100	

Based on table 5, it can be seen that knowledge has a relationship with compliance where there is a p value of 0.000.

Table 6. Relationship between Perceptions of Basic Immunization and Compliance with Providing Basic Immunization to Infants in the Work Area of the Wairoro Community Health Center, South Weda District

Perception	Compliance				Total		p Value
	No		Yes				
	f	%	f	%	f	%	
Negatif	10	19,2	5	13	15	16,5	0,001
Positif	42	40,8	34	87	76	83,5	
Total	52	57,1	39	42,9	91	100	

Based on table 6, it can be seen that perception has a relationship with compliance where there is a p value of 0.001.

DISCUSSION

Knowledge of Basic Immunization

Fifty-two respondents (57.1%) had a good level of knowledge, as shown in Table 2. Knowledge is the collection of information that enables a person to know something through experience or from birth.

This aligns with research (Undarti et al., 2013), which found that age, education, and occupation are some of the factors influencing a person's level of knowledge. Age is a factor that influences respondents' good knowledge. A person's level of maturity and strength increases with age.

This finding is also consistent with the theory of measuring knowledge, attitudes, and behavior (Wawan & M, 2011), which states that a person's comprehension and mindset can be influenced by age. A person's comprehension and mindset improve with age, thus enhancing the knowledge gained (Putra & Podo, 2017).

This is also in line with research (Astuti, Yudiernawati, & Maemunah, 2016), which shows that the majority of people aged 17 to 25 have a greater level of knowledge, and with age, a person's knowledge increases. Some respondents were in their mature years, which is the age when comprehension and reasoning skills improve, thus enhancing their knowledge. With age, a person becomes more mature in their thinking and work. According to (Faot, Sulastri, & Widayati, 2018), more mature people are more trusted by society than less mature people.

Education can also influence knowledge. Information is more easily accessible with a higher level of education (Rahmah, Ambardini, 2016).

Changes in the attitudes and behavior of an individual or group, as well as efforts to mature individuals through training and teaching, are known as education. According to (Bagaskoro, 2019), a higher level of education and the amount of training attended will undoubtedly influence the breadth of a person's knowledge. Everyday life involves education. A person's level of education impacts their cognitive abilities. Research results show that respondents with higher education have better knowledge. Education increases knowledge about diseases (Ermalynda & Nia, 2019). According to research conducted by Fadlilah and Rahil (2019), respondents from universities had a better understanding of futsal compared to respondents from secondary schools. According to Nursalam (2017), education is directly related to a person's knowledge, so it is expected that higher education can increase a person's knowledge. It is expected that someone with higher education will apply their knowledge,

especially when family members need assistance. Mass media, electronic media, manuals, health workers, etc. are some common sources of knowledge.

A person's brain performance and ability to store (memory) increases or improves when used frequently, such as in jobs that require frequent brain activity (Putra & Podo, 2017). The work environment can provide a person with direct and indirect experience and knowledge (Faot et al., 2018). This research aligns with research by Karina & Warsito (2012) that found that most mothers had good knowledge about immunization.

Therefore, according to the researchers, occupation can also influence knowledge. A person's knowledge and experience can be influenced by their occupation. Unemployed mothers have more time to learn about immunization, so they understand it better. Mothers who are knowledgeable about vaccination have obtained this information from various sources, including mass media, electronic media, and health workers.

Perceptions of Basic Immunization

The results showed that the majority of parents who responded had positive perceptions of basic immunization.

The survey also found that parents with negative perceptions agreed that basic immunization can cause additional illnesses, such as fever in infants after vaccination. Furthermore, parents believed that immunized and unimmunized infants were no different. Parents who believed that their babies were not sick and did not need vaccinations also preferred to give their children medicine when they were sick rather than prevent them from receiving basic vaccinations. Negative perceptions of immunization are also influenced by information from those around them. Perceptions about immunization are influenced by the dominant party. Seeing himself as the dominant party, a husband forbade his wife from immunizing their baby. He did this because he did not want to be disturbed by the baby's constant crying after the immunization (Etni, 2020).

The results of this study align with the theory (Kusumaningrum et al., 2022) which states that perception is one of the factors influencing parents' decision to vaccinate. According to the survey results, respondents with positive perceptions agreed that vaccination can prevent infectious diseases. Parents had been well-informed by health workers, both toddler health post (Posyandu) cadres and local community health center (Puskesmas) staff, as immunization is considered important for building immunity in infants.

Therefore, parents who participated in the study also saw the benefits of basic immunization, believing that immunized infants are less likely to get sick. Parents also believed that, even if they were not in an environment prone to infection, they should still receive basic

immunizations to prevent unwanted diseases. Parents also disagreed about whether vaccination causes disabilities.

Immunization Compliance

The results showed that the majority of respondents (78 respondents) were compliant with immunizations.

According to Lolong (2017), this study found a relationship between maternal education and maternal compliance with basic immunizations at the Tongkaina Community Health Center, Bunaken District, Manado City. This study also found a relationship between family support, maternal motivation, maternal attitudes, knowledge level, maternal actions, and health services with maternal compliance with basic immunization. Furthermore, there was a relationship between family support and maternal motivation. Although many other factors play a role, this study suggests that knowledge plays a role in determining compliance. However, this study did not consider the extent to which knowledge contributes to compliance.

The results of this study are objectively consistent with the findings of Momomuat et al. (2014) regarding the relationship between maternal knowledge level about the importance of measles vaccination and their compliance with it at the Kawangkoan Community Health Center. However, this study only covered measles immunization and cannot be generalized to basic immunization as a whole. This study also offers an opportunity to explore the contribution of knowledge and compliance levels.

The results of this study align with research conducted by Rizani et al. (2019), which examined the relationship between maternal knowledge, attitudes, and behavior during the administration of hepatitis B immunization for 0-7 days in Banjarmasin City. The study found that mothers with no knowledge were 5.96 times more likely to engage in inappropriate behavior during hepatitis B immunization compared to mothers with good knowledge. Furthermore, negative maternal attitudes also posed a risk. Mothers' behavior during the 7-day period following hepatitis B vaccination was associated with their knowledge and education level. However, this study did not quantify this behavior as compliance. Therefore, it can be concluded that mothers' knowledge and perceptions contribute to their compliance with vaccination.

The results of this study align with those of Astinah et al. (2013), who examined the relationship between education, knowledge, attitudes, and the practice of administering basic immunizations to infants at the Teratai Integrated Health Post (Posyandu) at the Tamamaung Community Health Center in Makassar. The study found a relationship between education, knowledge, attitudes, and practices related to immunization. Furthermore, this study showed

that education and knowledge had the most significant influence on immunization administration. The extent of their contribution to shaping behavior and compliance remains unclear.

Given the importance of immunization for children, researchers estimated that respondents had participated in immunization sessions. The study above shows that many variables play a role in maternal compliance with immunization. However, among these variables, knowledge appears to be the most prominent factor in determining maternal compliance with immunization.

The Relationship Between Knowledge and Compliance

There is a relationship between maternal knowledge about basic immunizations and infant compliance with immunizations, according to statistical test results, with a p-value of 0.000 ($p < 0.05$).

This aligns with research conducted by Lolong (2017), which analyzed variables related to maternal compliance with basic immunizations. The study showed a relationship between maternal knowledge and compliance with basic immunizations. The higher the level of education, the better the mother's knowledge, making it easier to change behavior to provide basic immunizations to infants.

According to Anggraini's research, there is a significant correlation between maternal knowledge about implementing complete basic immunizations and child compliance with complete basic immunizations ($p=0.017$). The mother's level of knowledge is related to the child's compliance with complete basic immunizations.

Researchers assume that maternal knowledge about immunizations significantly influences maternal compliance. This is due to parents' awareness of the importance of vaccinating their children, which in turn contributes to their compliance.

Parents play a crucial role in health promotion campaigns, especially in vaccinating infants. Knowledge largely influences a person's actions. Behavior based on knowledge will be more lasting than behavior without it. Mothers who understand the purpose and benefits of immunization will be more likely to complete basic immunizations. Therefore, every mother is expected to understand the importance of immunization for their children so that they will be healthy in the future.

Relationship Between Perception and Compliance

Based on the results of the research, data showed a relationship between mothers' perceptions about basic immunization and infant compliance with basic immunizations.

Statistical tests showed a p-value of 0.001 ($p < 0.05$). This means the p-value obtained is less than 0.005.

According to Ajzen's theory of planned behavior (2020), perceptions control behavior, or the behavior observed can help someone perform a behavior. One of the three factors that can influence the intention to perform a behavior is perception.

This aligns with research conducted by Dariah Elis Deti (2015), which found a relationship between parental perceptions of immunization compliance and their perceptions of basic immunizations for infants. Respondents in the previous study overwhelmingly held positive opinions.

According to the researchers, those with positive perceptions who did not complete their infants' basic immunizations were largely influenced by several factors, such as prohibitions from their husbands, friends' opinions that immunizations would make babies sick, and many who said that not immunizing wouldn't be a problem, or even that immunizations would weaken the child. These views and thoughts contributed to mothers or parents' tendency to choose not to immunize their infants. A mother's decision to take her child for basic immunizations was also heavily influenced by the role and support of the father. Although community health center staff had provided sufficient information and some respondents were aware of the benefits of immunization, due to a lack of support from those around them, they did not complete their infants' immunizations. Therefore, parents who have completed their children's basic immunizations have a positive perception of basic immunization.

4. CONCLUSION

Based on the research results, it can be concluded that the highest level of knowledge about basic immunization was in the good category, with 52 respondents (57.1%). Perceptions about basic immunization were mostly in the positive category, with 76 respondents (83.5%). The highest level of compliance with basic immunization was in the compliant category, with 78 respondents (85.3%). There was a correlation between the level of knowledge about basic immunization and compliance with basic immunization for infants in the Wairoro Community Health Center, South Weda District, with a p-value of 0.000. Furthermore, perceptions about basic immunization and compliance with basic immunization for infants in the Wairoro Community Health Center, South Weda District, with a p-value of 0.000.

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