

## THE RELATIONSHIP BETWEEN AGE AND MOTHERS' KNOWLEDGE OF POST IMMUNIZATION ADVERSE EVENTS (AEFI) IN INFANTS AGED 0-1 YEARS

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### ABSTRAK : HUBUNGAN ANTARA USIA DAN PENGETAHUAN IBU TENTANG KEJADIAN IKUTAN PASCA IMUNISASI (KIPI) PADA BAYI USIA 0-1 TAHUN

Latar Belakang: Imunisasi merupakan salah satu intervensi kesehatan masyarakat yang paling efektif dan terbukti mampu menurunkan angka morbiditas dan mortalitas akibat penyakit menular yang dapat dicegah dengan vaksin (Preventable Diseases). Data prevalensi KIPI di berbagai negara dan di Indonesia menunjukkan bahwa reaksi lokal ringan adalah jenis KIPI yang paling sering dilaporkan. Di Indonesia, data Riset Kesehatan Dasar (Riskesdas) tahun 2013 mencatat bahwa sekitar 33,4% anak mengalami KIPI. Gejala umum yang dilaporkan meliputi bengkak (20,2%), kemerahan (20,6%), dan demam tinggi (6,8%).

Tujuan: Mengetahui hubungan usia dengan pengetahuan ibu dalam cara penanganan KIPI (kejadian ikutan pasca imunisasi) pada bayi usia 0-1 tahun.

Metode: Metodologi yang digunakan dalam studi ini adalah desain *cross-sectional*. Jumlah populasi yang menjadi target penelitian adalah 56 responden, yang kemudian diambil sampelnya sebanyak 40 responden. Pengambilan sampel dilakukan melalui teknik *accidental sampling*. Instrumen menggunakan kuesioner terstruktur untuk mengukur variabel usia dan pengetahuan. Selanjutnya dianalisis secara statistik menggunakan uji *chi square*.

Hasil: Data yang diperoleh menunjukkan bahwa proporsi responden dengan pengetahuan baik mencapai 42,5%, dan mayoritas responden (52,5%) dengan usia reproduksi aktif (18-35 tahun). Hasil analisis inferensial dengan uji Chi Square memperkuat temuan ini, menunjukkan bahwa variabel usia dan pengetahuan ibu terkait secara signifikan dengan penanganan KIPI pada bayi usia 0-1 tahun, dengan nilai probabilitas sebesar  $p = 0.000$ .

Kesimpulan: Usia dapat mempengaruhi pengetahuan ibu terhadap tata cara penanganan kejadian KIPI pada bayi usia 0-1 tahun di Klinik Kalimantan, Gresik.

Saran: Melakukan sosialisasi dan KIE mengenai program imunisasi, termasuk pemaparan tentang reaksi samping yang mungkin muncul, akan mengurangi kekhawatiran dan ketakutan ibu.

Kata Kunci : Usia, Pengetahuan, KIPI, Bayi

### ABSTRACT

Background: Immunization is one of the most effective public health interventions and has been proven to reduce morbidity and mortality rates from vaccine-preventable diseases. Prevalence data on adverse events following immunization (AEFI) in various countries and in Indonesia show that mild local reactions are the most commonly reported type of AEFI. In Indonesia, data from the 2013 Basic Health Research (Riskesdas) recorded that approximately 33.4% of children experienced AEFI. Common symptoms reported included swelling (20.2%), redness (20.6%), and high fever (6.8%).

Objective: To identify the relationship between age and maternal knowledge in handling post-immunization adverse events in infants aged 0-1 year.

Method: The methodology used in this study was a cross-sectional design. The target population was 56 respondents, from which a sample of 40 respondents was taken. Sampling was conducted using accidental sampling techniques. The instrument used was a structured questionnaire to measure the variables of age and knowledge. The data were then analyzed statistically using the chi-square test.

Results: The data obtained showed that the proportion of respondents with good knowledge reached 42.5%, and the majority of respondents (52.5%) were of active reproductive age (18-35 years). The results of the inferential analysis using the chi-square test reinforced these findings, showing that the variables of age and maternal

knowledge were significantly related to the management of AEFI in infants aged 0-1 year, with a probability value of  $p = 0.000$ .

Conclusion: Age can influence mothers' knowledge of how to handle KIPI in infants aged 0-1 year at the Kalimantan Clinic, Gresik.

Suggestion: Conducting socialization and KIE (information, education, and communication) about the immunization program, including explanations about possible side effects, will reduce mothers' concerns and fears.

Keywords: Age, Knowledge, KIPI, Infants

## **INTRODUCTION**

According to WHO (Global Immunization Data) in 2010, 1.5 million children died from diseases that could have been prevented by immunization, and nearly 17% of deaths in children under 5 years of age could have been prevented by immunization. A report from The Lancet Journal of Health states that 7,000 babies die every day, with 98% of these deaths occurring in poor countries. The countries with the highest rates of maternal and infant mortality are those in Sub-Saharan Africa and South Asia. The infant mortality rate in Indonesia is 34 babies per 1,000 live births. This figure is not particularly impressive because there has been little change compared to five years ago. The main causes of infant mortality in Indonesia are acute respiratory infections (ARI) at 37%, and 50% of infant and toddler deaths are related to malnutrition. Another 13% of causes are diseases that can be prevented through immunization, such as measles and tuberculosis. If immunization programs are implemented effectively and comprehensively, the effectiveness of immunization can be maximized, thereby impacting the infant mortality rate (Tobing et al., 2024; Widyastuti, 2017). The implementation of immunization in toddlers saves approximately 2–3 million lives worldwide each year and contributes significantly to the decline in global infant mortality rates from 65 per 1,000 live births in 1990 to 29 in 2018 (Gianita Nadila, 2022). The primary immunization schedule is defined as a series of initial vaccinations that must be given to infants before they reach one year of age. The main purpose of this primary immunization is to optimize the infant's immune system so that it functions optimally. Every infant between the ages of 0 and 11 months is required to receive a complete basic immunization schedule, which includes 1 dose of Hepatitis B, 1 dose of BCG, 3 doses of DPT-HB-HiB, 4 doses of oral polio vaccine, and 1 dose of Measles/MR. (Kusumaningrum, Widayati, & Rahmawati, 2023). On 2021, around 25 million children missed out on vaccination, an increase of 5.9 million compared to 2019. Around 81% of infants worldwide received three doses of

diphtheria-tetanus-pertussis (DPT3) vaccine, which protects them from serious infectious diseases. However, 18.2 million infants did not receive the initial dose of the DPT vaccine, indicating a lack of access to immunization and health services. More than 60% of these children live in countries such as Angola, Brazil, India, Indonesia, and Nigeria (Pratiwi et al., 2024). According to research by Ainti, factors that influence the decline or reduction in immunization coverage, aside from the Covid-19 pandemic, include knowledge, education, age, perceived vulnerability, and concerns about the effects of post-immunization events. (Ainti et al., 2024).

Adverse events following immunization (AEFI) is a term used to describe any medical events experienced by patients after receiving immunization. The causes of AEFI are diverse; they can originate from the nature of the vaccine itself (side effects, pharmacological effects, toxicity), procedural errors (program or injection technique errors), or unrelated events (coincidence) (Y Yudi & Ilmiah, 2017). These symptoms can manifest locally, systemically, or involve the central nervous system, and can appear with rapid or slow intervals (Mulia, 2017). A common principle states that the faster the onset of AEFI, the more serious the potential symptoms. Clinical symptoms after immunization can arise quickly or slowly and can be divided into local symptoms, systemic symptoms, central nervous system reactions, and other reactions (Tobing et al., 2024). The symptoms and signs that appear as side effects after immunization will vary from one baby to another, depending on the baby's immune system. Some babies will have difficulty sleeping, cry more easily, and be restless. This is not because the vaccine is unsuitable, but because of an increase in body temperature that makes your baby uncomfortable (Mehmeti, Nelaj, Simaku, Tomini, & Bino, 2017). Furthermore, the success or failure of immunization can be seen after immunization, with signs of increased body temperature or swelling around the injection site. Side effects of immunization, such as increased body temperature, often cause parents to panic, feel

confused, and even cry when they see their baby's condition (Sisfiani Sarimin, Yulidar, Yuningsih, & Shahab, 2024).

Post-immunization side effects can vary from one baby to another, depending on individual immune systems. Some babies may show symptoms such as difficulty sleeping, increased crying, and restlessness. These reactions are not an indication of vaccine incompatibility, but are caused by an increase in body temperature that triggers discomfort in the baby. Furthermore, the success of immunization can often be observed through signs such as an increase in body temperature or local swelling around the injection site (Bangu & Surya, 2020; Fitriani & Suryani, 2016). Complications refer to any serious health complaints (illness or death) occurring within 30 days after immunization (Lena Nur Qintharina, Faranita, Ayu Aprilia, & Nugrohawati, 2024). In the 2013 Riskesdas study, it was found that more than one-third of children in Indonesia (33.4%) experienced KIPI. Common symptoms that dominate these incidents include local reactions such as redness (20.6%), swelling (20.2%), and pus-filled injection sites (6%), in addition to systemic symptoms such as high fever (6.8%). (Sari, Izzah, & Harmen, 2018; Sisfiani Sarimin et al., 2024). The most common adverse events following immunization are due to procedural errors and technical errors. (Mustika, Murhan, & Wandini, 2023) Not all incidents of AEFI are caused by immunization, as most of them are not related to immuniz (Umar, Fauzi, Herlina, Darmawan, & Febriani Putri, 2023). As a consequence of mothers' lack of knowledge about AEFI, if a child experiences fever symptoms after immunization, the mother will delay or even refuse to have the child immunized. This, of course, results in the child being vulnerable to disease (Felda & Adjie, 2023).

Midwives should intensify health education before administering immunizations. This step is an important strategy for alleviating mothers' anxiety

about side effects. Through clear information and counseling, parents will gain a proper understanding of immunization as a preventive measure. It is hoped that this awareness will ultimately make parents more proactive in maintaining their children's health and supporting their optimal growth and development (Azis & Ramadhani, 2019; Siagian, 2023).

A preliminary study conducted at the Satellite Clinic on five mothers with infants aged 0-1 year using the interview method found that one mother did not immunize her baby, two mothers immunized their babies incompletely, and two mothers immunized their babies completely. Based on the preliminary study, the researchers were interested in conducting a study titled "The Relationship Between Age and Mothers' Knowledge of Post-Immunization Adverse Events (AEFI) in Infants Aged 0-1 Years at the Kalimantan Clinic in Gresik."

## RESEARCH METHODS

This study is a descriptive analytical study with a cross-sectional design. The main purpose of this design is to analyze and test the correlation between age and mothers' knowledge of how to handle KIPI in infants aged 0-1 year. The target population was 56 mothers at the Petrokimia Gresik Hospital Kalimantan Clinic who had infants aged 0-1 year. A sample of 40 respondents was selected using the Accidental Sampling technique (as part of non-probability sampling) (Notoatmodjo, 2018). Data collection was conducted through a questionnaire on the respondents' knowledge and age. The relationship between variables was analyzed using the Chi Square test. This study will be conducted from September 2024 to February 2025.

## RESEARCH RESULT

### Univariat Research

Mother's Age Related to Handling of Adverse Events Following Immunization (AEFI) in Infants Aged 0-1 Year

**Table 1**  
**Frequency Distribution of Mother's Age Related to Handling of Adverse Events Following Immunization (AEFI) in Infants Aged 0-1 Year**

Mother's age	Frequency (f)	Percentage (%)
Healthy reproduction (18-35 years old)	21	52,5
Unhealthy reproduction (< 18 years old and > 35 years old)	19	47,5

Study 1 Based on research, age is one of the causes of anxiety about kipi, because age is one of the most important characteristics of a person. Age also has a very close relationship with various other characteristics of a person, and also has a close

relationship with place and time (Samahita & Hermawati, 2023). In this study, the mothers' ages ranged from 20 to 35 years. Age affects a person's comprehension and thinking patterns; as respondents age, they become more mature in their thinking and understanding of

problems. It can be concluded that a person's increasing age can influence the increase in knowledge they acquire. In middle age, individuals tend to play a more active role in society and social life. The desire to progress, acquire broader knowledge, and receive information more easily means that as a person ages, they gain more experience, thereby increasing their knowledge (Hasanah, Agustina, & Wardiati, 2024; Siregar, Manullang, Sipayung, & Aruan, 2024).

Mothers' Knowledge About How to Handle AEFI (Adverse Events Following Immunization) in Infants Aged 0-1 Year

**Table 2**  
**Frequency Distribution of Mothers' Knowledge About How to Handle AEFI (Adverse Events Following Immunization) in Infants Aged 0-1 Year**

Mothers' Knowledge	Frequency (f)	Percentage (%)
Good	17	42,5,5%
Fair	10	25,0%
Poor	13	32,5%

The frequency distribution of knowledge about how to handle AEFI (Adverse Events Following Immunization) in infants aged 0-1 year, as shown in Table 2, indicates that almost half of the respondents had good knowledge, with 17 respondents (42.5%). Knowledge is a person's perspective on the concept of health, which can ultimately improve health to an optimal level (Dwitara, Septiarini, Susanti, & Nirmala, 2015; Hassan, Khalil, Alseraty2, & El, 2022)). Good knowledge can be acquired by individuals from personal experience or from others, the mass media, and the environment (Hermayanti, Yulidasari, & Pujiati, 2017; Mehmeti et al., 2017). Good knowledge about KIPI can benefit individuals, namely when KIPI occurs, individuals know the steps to take and can reduce their anxiety levels (Damanik, Siregar, & Simbolon, 2021; Hasanah et al., 2024). The knowledge, according to Ariani (2014), is influenced by internal and external factors. Internal factors consist of age, gender, education, and occupation. External factors consist of: environment, socio-culture, economy, and sources of information. Based on Notoatmodjo (2012), knowledge is the result of an individual's understanding of an object using their senses, namely touch, hearing, smell, and sight (Notoatmodjo Soekidjo, 2012). This study agrees with the research by Naot, Milyati & Rahayu (2018) entitled "The relationship between mothers' knowledge about immunization and the level of KIPI at the Posyandu M in Malang City, which shows that  $p = 0.0008 < 0.05$ , meaning that there is a relationship between the level of mothers' knowledge about immunization (Naot, Milwati, & H., 2018). This is in line with the research conducted by Ririn Widyastutik in 2016, where the test results for the second relationship yielded an Asymp. Sig (2 sided) or p-value: 0.038, a p-value smaller than 0.05 indicates that the hypothesis is accepted, stating that there is a relationship between

knowledge and KIPI at the Oebobo Community Health Center in 2016 (Widyastuti, 2017).

The most important problems of passive surveillance systems include underreporting, deficiency and inaccuracy of information. Mothers with infants aged 0-1 years in this study had good knowledge about how to handle AEFI (Adverse Events Following Immunization). This was because the respondents had attended counseling sessions about AEFI, and most of the respondents understood the procedures for handling AEFI. After the study, they obtained information about the definition and procedures for handling AEFI from the internet and education from health workers. Providing passive information about AEFI may cause mothers to become more anxious and fearful due to incorrect information (Hassan et al., 2022; Khatereh, Koruosh, Alireza, Daryuosh, & Parastoo, 2023). According to research conducted by Rani Kawati Damanik et al. (2021) on mothers' knowledge of post-immunization adverse events following DPT immunization, the results showed a strong and positively correlated relationship between mothers' knowledge of post-immunization adverse events (KIPI) and the administration of DPT immunization, with a p-value of 0.000 ( $p < 0.05$ ) and an r-value of 0.577, meaning that there is a strong and positive correlation between mothers' knowledge about post-immunization adverse events (KIPI) and the administration of DPT immunization (Lena Nur Qintharina et al., 2024).

These are in line with the research conducted by Nafis (2020) on the relationship between mothers' knowledge and compliance with complete basic immunization for infants aged 0-9 months in the working area of the Peudada Community Health Center in Bireuen District, where there were 7 mothers with insufficient knowledge, 2 compliant mothers, and 5 non-compliant mothers (Nafis, Ismail, & Rizana, 2021). This research is in line with (Hety & Susanti, 2020), which found that of the 40 respondents, 22 respondents (55%) had a good level of knowledge about immunization (Siwi Hety & Yuni Susanti, 2020). This study is also in line with research conducted by Ni Ketut Ayu in 2020. It is known that out of 77 respondents, almost half, namely 20 (26%) respondents, had good knowledge, most, namely 48 (62.3%) respondents, had sufficient knowledge, and a small portion, namely 9 (11.7%) respondents, had insufficient knowledge (Ayu Sugiartini, 2020). The research conducted by Yudi et al., 2017 mentions data and discussion of research results in the good category, obtained from respondents who stated that mothers of toddlers routinely receive information about immunization from health center cadres. In addition, all mothers of infants said that respondents often sought information about health through mass media and social media (Yudi Yudi, Yudiernawati, & Catur Adi W, 2017).

#### **Bivariat Research**

The relationship between knowledge and mothers' attitudes towards handling AEFI (Adverse Events Following Immunization) in infants aged 0-1 year

**Tabel 3**  
**Test of the Relationship Between Knowledge and Attitudes of Mothers Regarding the Handling of AEFI (Adverse Events Following Immunization) in Infants Aged 0-1 Year**

Mother's age	Knowledge						Total	p-Value
	Good		Fair		Poor			
	f	%	f	%	f	%		
Healthy reproduction (18-35 years old)	13	32,5	7	17,5	1	7,5	21	52,5
Unhealthy reproduction (< 18 years old and > 35 years old)	4	10,0	3	7,5	12	30,0	19	47,5

Based on Table 3, it is known that the statistical test results to determine the relationship between knowledge and mothers' attitudes about how to handle AEFI (Adverse Events Following Immunization) in infants aged 0-1 year using Chi Square analysis, a p-value of 0.000 was obtained, which is smaller than  $\alpha = 0.05$ . The research hypothesis H0 is rejected and H1 is accepted, meaning that there is a relationship between knowledge and attitudes about how to handle AEFI (Adverse Events Following Immunization) in infants aged 0-1 year. The results of this study are in line with Galuh's 2019 study, which found that of the 88 respondents, most were aged 20-35 years, namely 71 respondents (80.7%) (Galuh, 2019). According to Chrisnawati et al., 2022, the study found that 34 respondents (45%) were aged 17-25 years and 34 respondents (45%) were aged 26-36 years. The majority of respondents were aged 20-35 years, totaling 21 people (70%), and the minority were aged >35 years, totaling 2 people (6.67%) (Chrisnawati, Subarjo, Sapariah, & Anastasia, 2022). This shows that age is a big factor in gaining knowledge. Age affects a mother's knowledge; the older she gets, the more experience and knowledge she gains, which helps her become more mentally and intellectually mature. Older individuals can influence their ability to think and receive information better than younger individuals (Sari et al., 2018). The immunization program aims to provide immunity to infants in order to prevent diseases and deaths among infants and children caused by frequently occurring diseases (Proverawati and Andhini, 2010). As immunization coverage increases, so does the use of vaccines, and as a result, adverse reactions related to immunization also increase. Adverse reactions are known as adverse events following immunization (AEFI) (Pusdiknakes, 2014). AEFI are medical events suspected to be related to immunization, whether in the form of vaccine reactions or side effects, pharmacological effects, injection reactions, or procedural errors (Bangu & Surya, 2020). Misinformation often uses fear mongering regarding AEFI that may occur in children after receiving immunization (Nolita & Silvia, 2023). The procedure for handling AEFI can be influenced by several factors, one of which is the mother's knowledge and attitude.

However, in this study, there were still mothers who had a positive attitude but did not complete basic immunization because there may have been factors in line with the theory (Notoatmodjo, 2014), namely the physical environment. If the physical environment does not support positive behavior in complying with health

protocols, it will influence negative attitudes, while negative attitudes but complete basic immunization can occur due to the level of appreciation, meaning that someone gives a positive value to an object or stimulus, inviting or influencing someone to respond. This attitude is shown by health workers and posyandu cadres, thereby influencing mothers who have negative attitudes towards the completeness of their babies' basic immunization.

The older the respondents, the more developed their comprehension and mindset regarding post-immunization events. However, with age, the ability to acquire or remember knowledge decreases. Therefore, middle-aged people are required to read and make an effort to adapt to old age. In this study, it was found that parents aged over 40 years had a higher level of knowledge compared to parents aged over 40 years or under 18 years. Research conducted by Ni'mah, Djarot, and Wahyuni (2015) explains that there is a relationship between the level of mothers' knowledge about the side effects of immunization and their attitudes towards complete basic immunization, with a p-value of 0.024 (Ni'mah, N. U., Djarot, H. S., and Wahyuni, D., 2015). The results obtained from most respondents in this study indicate that they have good knowledge and attitudes regarding the procedures for handling KIP in infants aged 0-1 years. This is in line with similar research by Ayu (2020), in which respondents of reproductive age had a good level of knowledge about the symptoms, onset, and treatment of KIP (Ayu Sugartini, 2020).

## DISCUSSION

Further research is still needed on other factors related to the management of post-immunization adverse events in infants aged 0-1 year by adding other variables.

## CONCLUSION

The research conducted on the management of AEFI (adverse events following immunization) in infants aged 0-1 year was influenced by the age and knowledge of the mother.

## SUGGESTION

Information about immunization and the management of post-immunization adverse events in infants aged 0-1 year should be provided to

mothers in full. This will help prevent post-immunization adverse events and serve as a basis for planning coordination with the nearest community health center on how to manage post-immunization adverse events.

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