

The Correlation between the knowledge and attitudes of mothers of toddlers about immunization with compliance to complete routine immunization in Wage Village, Taman Subdistrict, Sidoarjo Regency, East Java, Indonesia

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Abstract

Introduction: The under-five mortality rate in Indonesia and East Java in 2021 shows a downward trend from 2020, with the main cause of under-five mortality being infectious diseases such as pneumonia and diarrhea. One of the factors that contributed to this was the increase in complete immunization coverage for babies in previous years; however, in the 2021 and 2022 periods in Indonesia and East Java, there was a significant decline in the number of complete immunization coverage. Community behaviour regarding improving health, in this case, immunization, is determined by many factors, one of which is the knowledge and attitudes of the mothers of toddlers themselves.

Objective: Analyzing the correlation between the knowledge and attitudes of mothers of toddlers regarding immunization and compliance with providing complete routine immunization in Wage Village, Taman District, Sidoarjo Regency, East Java, Indonesia.

Method: This research used quantitative methods with a cross-sectional approach. Data was collected through questionnaires given to 90 mothers of toddlers aged 24-59 months in Wage Village who had a Healthy Way Card (KMS) or Maternal and Child Health Book (KIA); the sample size was calculated using the Compare Two Proportions formula, sampling techniques using Purposive Consecutive Sampling, and Fisher's Exact test was used to see the correlation between the two variables.

Results: The results of this study show that there is no significant correlation between the knowledge of mothers of toddlers about immunization and compliance with providing complete routine immunization ($p=0.434$), and there is no significant correlation between the attitude of mothers of toddlers about immunization and compliance with providing complete routine immunization ($p=1.000$).

Conclusion: The results of this study indicate that neither the knowledge nor attitudes of mothers of toddlers regarding immunization have a significant correlation with compliance in providing complete routine immunization in Wage Village, Taman District, Sidoarjo Regency. Efforts to increase immunization compliance need to focus on other aspects, such as cross-sectoral cooperation, accessibility of health services and more comprehensive education programs for mothers of toddlers, families and the community.

Keywords: knowledge; Attitude; Mothers of toddlers; Immunization; Child health

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1. Introduction

The number of under-five deaths in Indonesia in 2021 was 27,566, a decrease from 28,158 in 2020. The main causes of death were diarrhea (10.3%) and pneumonia (9.4%) (1). In East Java, the number of under-five deaths also decreased from 3,867 in 2020 to 3,598 in 2021, with the main causes being pneumonia and diarrhea (2). The under-five mortality rate decreased primarily due to increased complete immunization coverage.

In 2019, UCI coverage (Universal Child Immunization) in East Java reached 90.4%, IDL (Complete Basic Immunization) 99.34%, DPT-HB-HIB 4 follow-up immunization 89.3%, and MR2 follow-up immunization 90.0% (3). However, in 2021, immunization coverage decreased significantly: Village UCI in Indonesia at 58.4% and in East Java at 72.1%, Complete Basic Immunization in Indonesia at 84.2% and in East Java at 90.3%, DPT-follow-up immunization HB-HIB 4 in Indonesia is 56.2% and in East Java 59.8%, as well as MR 2 follow-up immunization in Indonesia 58.5% and in East Java 70.6% (1,2).

This decrease in immunization coverage has triggered increased VPD cases and extraordinary events (KLB) such as measles, rubella, and diphtheria (4). The government is holding National Child Immunization Month (BIAN) in April 2022 to overcome this.

The theory of health behaviour change by Lawrence Green (1980) states that health behaviour is determined by knowledge and attitudes. Research conducted by (5) and (6) shows a correlation between maternal knowledge and attitudes and immunization completeness. The results of a preliminary study at the Taman Community Health Center in October 2023 show that many parents still need to comply with the immunization schedule. BIAN 2022 data shows that the Taman Health Center has the most BIAN Kejar targets in the Sidoarjo Regency. Based on the problems above, researchers are interested in further research regarding the correlation between knowledge and attitudes of mothers of toddlers regarding immunization and compliance with providing complete routine immunization in Wage Village, Taman District, Sidoarjo Regency, East Java, Indonesia.

2. Research methods

This research uses a cross-sectional observational analytic design approach. The aim is to analyze the correlation between the knowledge and attitudes of mothers of toddlers regarding immunization and compliance with complete routine immunization. The research population consisted of mothers with toddlers aged 24-59 months in Wage Village, Taman District, Sidoarjo Regency, with 793 people. The research sample comprised 90 mothers of toddlers, selected using the purposive-consecutive sampling technique.

Data was collected from January to May 2024 through a questionnaire that included respondent characteristics, knowledge about immunization, attitudes towards providing complete routine immunization, and compliance with immunization based on the KMS or KIA book. Data analysis includes univariate analysis to describe the distribution of variables and bivariate analysis using Fisher's Exact tests to test the correlation between knowledge and attitude variables and immunization compliance.

The validity test was conducted on 20 respondents selected from mothers of toddlers aged 24-59 months at the Wage Village Posyandu. The significance level is 5% ($\alpha = 0.05$), so the correlation value must be greater than 0.444 to meet the significance criteria. The results of the reliability test show that the knowledge questionnaire has a value Alpha Cronbach of 0.834, and the attitude questionnaire was 0.948, indicating good reliability. It is hoped that the findings of this research will provide deeper insight into the factors that influence maternal compliance in providing complete routine immunization to toddlers in Wage Village, Sidoarjo Regency.

3. Results

3.1. Presentation of General Characteristics and Data

The table shows that most (54.4%) of the respondents were 26-35 years old, and almost half (46.7%) of the respondents' educational level characteristics were high school. Meanwhile, for employment status, the majority (71.1%) were housewives, and for parity characteristics, the majority of respondents (67.8%) had less than or equal to 2 children.

Table 1 Frequency distribution of characteristics of mothers of toddlers aged 24-59 months in Wage village, Taman subdistrict, Sidoarjo regency in 2024 (n=90)

Characteristics	Frequency (f)	Percentage (%)
Age		
17 - 25 Years	6	6.7
26 - 35 Years	49	54.4
36 - 45 Years	35	38.9
Education		
Elementary School	0	0.0
Junior High School	12	13.3
Senior High School	42	46.7
College	36	40.0
Work		
Civil servants	5	5.6
Private	13	14.4
Self-employed	8	8.9
Housewife	64	71.1
Parity		
Number of Children >2	29	32.2
Number of Children ≤2	61	67.8
Total	90	100,0

Table 2 Description of the level of knowledge, attitudes and compliance of mothers in providing complete routine immunization for toddlers aged 24-59 months regarding immunization

Characteristics	Frequency (f)	Percentage (%)
Knowledge level		
Not enough	2	2.2
Enough	29	32.2
Good	59	65.6
Attitude		
Negative	6	6.7
Positive	84	93.3
Immunization Compliance		
Comply	40	44.4
Disobedient	50	55.6
Total	90	100,0

Based on the table above, it can be seen that the majority (65.6%) of respondents in Wage Village, Taman District, Sidoarjo Regency have good knowledge regarding complete routine immunization, while 32.2% have sufficient

knowledge, and only 2.2% have sufficient knowledge, which needs to be improved. Almost all respondents (93.3%) in Wage Village had a positive attitude regarding immunization, with only 6.7% having a negative attitude. However, most respondents did not comply with providing complete routine immunization to their toddlers, amounting to 55.6%.

3.2. Bivariate Analysis

The correlation between mother's knowledge of toddlers and mother's attitude with compliance with complete routine immunization in Wage Village, Taman District, Sidoarjo Regency

Characteristics	Compliant		Not Compliant		Total		Fisher's Exact Test
	f	%	f	%	f	%	
Knowledge							0.434
Low	0	0	2	100	2	100	
Moderate	15	51.7	14	48.3	29	100	
Good	25	42.4	34	57.6	59	100	
Total	40	44.4	50	55.6	90	100	
Attitudes							1.000
Negative	3	50	3	50	6	100	
Positive	37	44	47	56	84	100	
Total	40	44,4	50	55,6	90	100	

The table above shows that the two respondents who had less knowledge (100%) needed to be more compliant in providing complete routine immunization to their toddlers. Meanwhile, of the 29 mothers with sufficient knowledge, the majority (51.7%) complied with providing complete routine immunization to their toddlers. However, of the 59 respondents with good knowledge, the majority (57.6%) needed to be more compliant in providing complete routine immunization to their toddlers. Bivariate analysis results using Fisher's Exact Test obtained a p-value of 0.434, more excellent than α 0.05. Therefore, it can be concluded that in this study, H_0 is accepted, meaning that there is no correlation between maternal knowledge and compliance with complete routine immunization in Wage Village, Taman District, Sidoarjo Regency.

The results of the analysis of the correlation between maternal attitudes and compliance with providing complete routine immunization in Wage Village, Taman District, Sidoarjo Regency, East Java, Indonesia, show that of the six mothers who had a negative attitude towards immunization, half of them (50%) were compliant in providing complete routine immunization to their toddlers. Meanwhile, of the 84 mothers who had a positive attitude towards immunization, the majority (56%) were not compliant in providing complete routine immunization to their toddlers. Bivariate analysis results using Fisher's Exact Test, a p-value of 1.000 is obtained, greater than α 0.05. Therefore, it can be concluded that in this study, H_0 was accepted, meaning that there was no correlation between maternal attitudes and compliance with complete routine immunization in Wage Village, Taman District, Sidoarjo Regency.

4. Discussion

4.1. Respondent Characteristics

Based on Table 1, the majority (54.4%) of the characteristics of mothers of toddlers are in the age range of 26-35 years. Age characteristics significantly influence the high level of knowledge of mothers of toddlers, especially about immunizations, based on their ability to use technology to obtain information in the current era of digitalization and based on their experience of providing previous immunizations.

Almost half (46.7%) of the respondents had a high school education level, and almost the other half (40%) had a college education level. This level of education reflects that most respondents have a good education. The education level of

mothers of toddlers influences their knowledge and attitudes towards health, including immunization. Higher education is usually associated with greater awareness of the importance of good health practices, such as providing complete and on-schedule immunizations to toddlers.

Most respondents (71.1%) are housewives. This employment status indicates that most respondents do not work outside the home, which should give them more time to focus on childcare and attending community health programs such as Posyandu. Their role as housewives can also influence how they allocate time and resources for their children's health care, such as providing complete routine immunizations according to schedule.

For parity characteristics, most respondents (67.8%) had less than or equal to two children. The number of children can influence the experience of previous family immunization history. Experience is one of the factors in humans that significantly determines the reception of stimuli in the ongoing perception process. People who have experience will always be more innovative in dealing with things than those who have no experience at all. So, a person's experience will influence their decision-making process to behave in a certain way, such as their behaviour in providing immunization compliance to their children.

These data provide a comprehensive picture of the demographic profile of the respondents in this study, which is essential for understanding the socio-cultural and economic context in which they live. It also helps evaluate how demographic characteristics influence child health and care decisions, behaviours, and practices. This information can be used to develop more targeted and effective interventions for improving maternal and child health in the community through this research.

The Correlation Between Mothers of Toddlers' Knowledge About Immunization and Compliance with Providing Complete Routine Immunizations in Wage Village, Taman District, Sidoarjo Regency, East Java, Indonesia

Based on the research results, most mothers of toddlers in Wage Village, Taman District, Sidoarjo Regency have good knowledge about immunization, with 65.6% of respondents showing good understanding. This characteristic is primarily supported by their level of education, where 46.7% graduated from high school and 40% from college. However, most (55.6%) do not comply with providing complete routine immunization to their children. The bivariate analysis results showed no significant correlation between the mother's knowledge about immunization and compliance in providing complete routine immunization ($p = 0.434$).

The studies cited in this research provide a diverse picture of the factors influencing maternal compliance in immunizing their children. (7) found a significant correlation between maternal knowledge about primary immunization and compliance in providing immunizations to babies. This aligns with the theory that knowledge is essential in shaping health behaviour. However, the results of research (8) show no significant correlation between maternal knowledge and compliance with immunization, highlighting the complexity of other factors that may influence maternal compliance. Apart from that, the characteristics of Generation Z, who grew up in the digital era with broad access to technology and information, as explained by (9), are also important considerations in understanding how this generation interacts with health information, including immunization. Thus, the results of this study provide in-depth insight into how knowledge, technology, and cultural aspects play a role in mothers' health decisions regarding their children's immunization.

Most respondents came from the Millennial Generation and Gen Z, with broad access to technology and information. However, more is needed to provide a complete compliance level with immunization. Other factors such as forgetting the immunization schedule, the condition of often sick toddlers, local traditions that influence perceptions about immunization, lack of family support, and limited interaction with health workers or health cadres, community leaders and religious leaders may also influence this compliance. Other studies show that, although maternal knowledge is vital in shaping health behaviours such as providing immunizations, other factors such as social support and cultural influences also play a significant role (10–14).

This underscores the complexity of immunization compliance behaviour and emphasizes the need for a contextual approach to increasing immunization coverage at the community level.

The Correlation Between Mothers' Attitudes Regarding Immunization and Compliance with Complete Routine Immunization in Wage Village, Taman District, Sidoarjo Regency, East Java, Indonesia

Research conducted in Wage Village, Taman District, Sidoarjo Regency revealed that although most mothers had a positive attitude towards immunization (93.3%), most were disobedient in providing complete routine immunization

to their children. The bivariate analysis results show no significant correlation between mothers' attitudes about immunization and their level of compliance in providing complete routine immunization, with a p-value of 1,000.

This research highlights an interesting finding that is not in line with Lawrence Green's theory, which states that a positive attitude will encourage behaviour that is in line with expectations (15). Although a positive attitude towards immunization is generally considered an essential predisposing factor in immunization behaviour, this study suggests that other factors may be more dominant in influencing mothers' compliance with providing immunizations to their children.

Apart from that, this research also links the contradictory results to the findings of Muklati and Rokhaidah (2020), Notoatmodjo (2003) and Pramitasari and Puteri (2017), which show that there is a correlation between attitudes and behaviour in the context of providing immunizations. However, this research aligns with research conducted by Maryani and Sulastri (2009) and Rizani et al. (2009), which shows a correlation between attitudes and behaviour in immunization.

Other factors such as confidence in immunization, family experience with previous immunization, and maternal motivation may also play an essential role in determining compliance with immunization.

In conclusion, although a positive attitude towards immunization is essential, compliance in providing complete routine immunization to children is influenced by various complex factors. It can vary between individuals as well as social and cultural contexts.

The theory states that a positive attitude should influence immunization compliance behaviour, such as the Health Belief Model and Theory of Planned Behavior, not in line with these findings. Other factors, such as maternal parity characteristics, predominantly having low parity (≤ 2 children) in Wage Village and previous immunization experience in the family, may also influence immunization compliance. For example, research (21) shows that mothers with low parity tend to have lower levels of immunization compliance than mothers with high parity.

In this context, the complexity of factors influencing immunization compliance becomes clear. While maternal attitudes towards immunization are essential, other factors such as individual characteristics, beliefs, motivation and family experience also play a significant role (22–25). Therefore, strategies to increase immunization compliance must consider these factors holistically, including approaches that build trust, motivation, and education appropriate to the local context and characteristics of the population at hand.

The results of this research provide a deeper understanding of the challenges and opportunities in increasing immunization coverage, especially in Wage Village, Taman District, Sidoarjo Regency. The key to achieving success in the immunization program is an approach that is adapted to the local context or customs and considers psychological and social factors appropriate to the area.

5. Conclusion

In Wage Village, Taman District, Sidoarjo Regency, East Java, Indonesia, mothers of toddlers are generally aged 26-35 years, have middle to upper education, and most are housewives with low parity (≤ 2 children). Despite having positive knowledge and attitudes about immunization, compliance in providing complete routine immunization to children is still low. No significant correlation was found between the knowledge and attitudes of mothers of toddlers and compliance with complete routine immunization, indicating the complexity of the factors that influence immunization behaviour in this community. It is hoped that there will be high cooperation and commitment from all levels, including mothers of toddlers, Community Health Centers, Health and Education Services, local and regional governments and policymakers to make the immunization program a success as a form of effort to provide immunity against VPD and reduce the death rate of toddlers due to VPD cases. Activities could involve creating innovative technology systems for immunization schedule reminders for mothers and strengthening partnerships with health volunteers to reactivate immunization outreach activities. Local governments can also persuade residents and establish regulations or laws regarding the obligation of immunization for toddlers by the central government.

Compliance with ethical standards

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Disclosure of conflict of interest

There was no conflict of interest.

Statement of Ethical Approval

Ethical clearance was approved by the Health Research Ethics Committee, Faculty of Medicine, Airlangga University, Surabaya, Indonesia with number 67/EC/KEPK/FKUA/2024 on March 21 2024.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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