

**FACTORS INFLUENCING THE COVERAGE OF COMPLETE BASIC IMMUNIZATION IN TODDLERS****Chamy Rahmatika^{1*}, Denos Imam Fratama², Lili Permatasari³**^{1,2,3}STIKES Syedza Saintika, Jalan Prof. Hamka no. 228 Padang, Indonesia* Correspondence Author: chamyrahmatika@gmail.com**ARTICLE INFO****Article History:**

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DOI:<https://doi.org/10.26553/jikm.2023.14.2.210-222>**Available online at**<http://ejournal.fkm.unsri.ac.id/index.php/jikm>**ABSTRACT**

The coverage of complete basic immunization is still low in the working area of Mentawai Regency, which is 59.8%. The national target achievement is 95%, indicating a gap of 35.2%. The aim of this research was to identify the factors influencing the completion of basic immunization. The research method used is analytical research with a cross-sectional study approach. The sample in this research consists of children aged more than 9 months until 5 years, totaling 132 respondents. The respondents were selected using simple random sampling. The analysis includes univariate, bivariate, and multivariate analyses. The findings revealed that more than half of the respondents did not complete their basic immunization (63.2%), and more than half of them had a low level of knowledge (60%). Support from father was also lacking for more than half of the respondents (63.3%), and there were concerns about inadequate sociocultural factors (57.8%). There was a significant relationship between family support, sociocultural factors, and knowledge level with the completeness of basic immunization ($P < 0.001$). The multivariate analysis indicated that having low father support resulted in a 7.3 times higher likelihood of incomplete immunization compared to having high father support. Therefore, the suggestion for this study is to improve not only the knowledge level of mothers but also to increase the knowledge of fathers, so that they can provide full support for their child's health.

Keywords: basic immunization, coverage, toddlers

Introduction

According to Law Number 36 of 2009 concerning Health, immunization is one of the efforts to prevent infectious diseases and is a priority activity of the Ministry of Health as part of the government's commitment to achieving the Sustainable Development Goals (SDGs), particularly in reducing child mortality.^{1,2} Based on data from the World Health Organization (WHO), out of 194 countries, 65 of them have Diphtheria, Pertussis, and Tetanus (DPT) immunization coverage below the global target of 90%. It is estimated that globally, by the year 2022, 1 in 5 children, or about 21.8 million children, will not receive life-saving immunizations.³⁻⁵

The coverage of complete basic immunization in Indonesia has experienced a decline since 2020. The Directorate General of Disease Prevention and Control, Health Ministry of Indonesia, is urging local governments, especially health offices, to reach the target immunization coverage of 79.1%.⁶⁻⁸ However, based on routine immunization data for October 2022, the coverage of complete basic immunization has only reached 58.4% of the target. Banten province is close to the target, with a coverage of 78.8%. Meanwhile, there are other regions with complete basic immunization coverage above 60%, such as South Sulawesi, Bengkulu, North Sumatra, Bali, Gorontalo, Lampung, Bangka Belitung, East Java, and Jambi.⁹⁻¹² The coverage of complete basic immunization in West Sumatra in 2020 was 76.18%, but it decreased to 54.11% in 2021. In 2022, there was a slight increase to 59.8%. Based on the complete immunization achievement in the last three years, it can be seen that it is still below the national target of 95%.^{9,13-15}

The complete basic immunization coverage in West Sumatra Province in 2020 was 76.18%. It decreased to 54.11% in 2021, while in 2022, there was a somewhat insignificant increase to 59.8%. Based on the achievement of complete immunization over the past 3 years, it can be observed that the rates remain below the national target of 95%.^{16,17} According to data from the Health Department of the Mentawai Islands Regency, the coverage of complete basic immunization for infants in the past 3 years in the Mentawai Islands Regency was as follows: 59.7% in 2020, an increase to 76.1% in 2021, and a further increase to 83.4% in 2021. In 2022, the lowest achievement of complete immunization coverage in the Mentawai Islands Regency was found in Bosua Public Health Center, with rates of 50.3% in 2019, 65.0% in 2020, and 63.8% in 2021. However, all public health centers in the Mentawai Islands Regency have not yet reached the expected target of 95%.^{18,19}

The low coverage of complete basic immunization is influenced by several factors, including behavioral and non-physical factors. Therefore, efforts to improve health issues should focus on these two factors. Factors influencing the formation of behavior include: 1) predisposing factors, such as the community's knowledge and attitudes towards health, sociocultural beliefs related to health, value systems embraced by the community, education level, socioeconomic status, etc.; 2) enabling factors, such as the availability of health facilities and infrastructure for the community; 3)

reinforcing factors, such as motivation, family support, healthcare services, and the behavior of community leaders.^{2,8,20,21}

Despite basic immunizations being provided free of charge for decades, the coverage of immunization has not met the national target due to various reasons such as misconceptions about immunization, low awareness among mothers to bring their children to health posts or public health centers for complete immunization due to fear of side effects, and some perceive that immunization is unnecessary for their babies.^{9,10,22,23} The low coverage of complete basic immunization is also caused by mothers who do not want to immunize their children at health posts or public health centers because they are not aware of the benefits of immunizing their children or because of the distance from their homes to the health posts or public health centers where immunization is conducted.^{21,24}

In recent years, there may have been changes in public perception regarding immunization, the development of new vaccines, or other factors influencing immunization coverage. Current research will help ensure that our knowledge of these matters remains up-to-date.^{9,10,23,25} Recent research is also important to ensure the sustainability of immunization programs. By understanding the factors that influence immunization coverage, we can identify issues and challenges that need to be addressed to maintain the continuity of these programs.^{9,26-28} Overall, research on factors influencing the coverage of complete basic immunization in toddlers is crucial to ensure the health and well-being of children and to improve overall community immunity level.^{5,9,27,28} Based on the background provided above, this research aims to investigate the factors influencing incomplete infant basic immunization. The impact of this research includes the improvement of immunization programs, the formulation of local policies related to immunization, and public education about the dangers of incomplete immunization for children.

Methods

The research was cross-sectional study, which examined the relationship between independent variables and the dependent variable measured at the same time.^{29,30} This study was conducted in the working area of Bosua Public Health Center, Mentawai Islands Regency. Data collection took place in April 2023. The population refers to the entire research or study subjects. The population in this study consists of all mothers who have children aged > 9 months - 5 years in the working area of Bosua Public Health Center who have a MCH (Mother and Child Health) book, Mentawai Islands Regency, in the year 2023 (January to March), totaling 394 individuals. The sample size for this study was 120 individuals. To account for potential dropouts, the researchers will add 10% of the total sample size, making it 12 individuals. Therefore, the total sample size to be taken is 132 individuals.

The variables studied are independent variables: respondent characteristics, which include the Knowledge Level of Mothers, Fathers Support, Social, and Cultural Conditions, Mother's Age, Mother's Education, Mother's Occupation, and the dependent variable is Complete Basic Immunization. The measurement method is through questionnaires and MCH book observations. This research questionnaire was adopted from a subsequent research questionnaire. After adoption, the researcher formulated questionnaire items according to the research context. The formulation of these items involves the researcher creating a list of questions to be used in the questionnaire. Following the item formulation, an expert assessment was carried out. This expert assessment involves the compilation and evaluation of the items by specialists (in this case, internal reviewers). After expert assessment, data analysis is conducted, measured with validity and reliability tests, and the results show that all the questions have an above-threshold value (0.196), thus confirming the usability of this questionnaire.

The sampling method used is simple random sampling. Exclusion criteria: can not be found after 3 visits. The research analysis methods include univariate, bivariate, and multivariate analyses. Univariate analysis is used to determine the frequency distribution of each independent variable with the dependent variable. Bivariate analysis examines the relationship between two variables which is suspected to be related and collaborate. To determine the influence between independent and dependent variables, the data analysis used employs the SPSS tools, and the chi-square test analysis is conducted with a significance level of 95%.

The multivariate analysis method used is Logistic Regression Analysis. Logistic regression is suitable when the dependent variable is binary, indicating whether toddlers receive complete immunization (1) or not (0). This method estimates the odds of receiving complete immunization based on various factors and determines the significance of each factor. In this modeling stage, multivariate modeling is conducted by selecting variables considered significant to be included in the model. This is done by retaining variables with a p-value < 0.05 and removing variables with a p-value > 0.05 . The removal of variables is done gradually, starting with the variable with the largest p-value. After removing one by one, the changes in the Odds Ratio (OR) values for the other variables were observed. There were no changes in the OR values $> 10\%$ after gradually removing the variables. The research method and protocols have been approved by the Health Research Ethics Committee of SyedzaSaintika College of Health Sciences (Ethical Clearance Letter No. 023/PPPM-SS/I/2023).

Results

Table 1 explains more than half of the respondents are aged >9 months - 1 year (56.8%), and 27.3% consist of respondents aged >3 years - 5 years. Table 1 also explains that more than half of the respondents are female (62.9%), while the rest are male.

Table 1. Respondent Characteristics of Complete Basic Immunization

Characteristics	f	%
Toddler's Age		
> 9 months – 2 years	75	56,8
> 2 years – 3 years	21	15,9
> 3 years – 5 years	36	27,3
Toddler's Sex		
Male	49	37,1
Female	83	62,9
Complete Basic Immunization		
Incomplete	84	63,3
Complete	48	36,7
Mother's Knowledge		
Low	79	60,0
High	53	40,0
Father Support		
Not Supportive	84	63,3
Supportive	48	36,7
Social and Cultural Conditions		
Poor	76	57,8
Good	56	42,2
Mother's Age		
Late Adolescents (17-25 years)	24	18,2
Early Adults (26-35 years old)	72	54,5
Late Adults (36-45 years old)	36	27,3
Mother's Education		
Elementary School	27	20,4
Junior High School	53	40,2
High School	26	19,7
College/University	26	19,7
Mother's Occupation		
Housewife	88	66,7
Farmer	16	12,2
Private Employee	15	11,3
Civil Servant	13	9,8
Total	132	100%

In Table 1, the Univariate Analysis shows that more than half of the toddlers did not receive complete immunization (63.2%), and more than half of the respondents have a low level of knowledge (60%). Additionally, more than half of the respondents' fathers do not support immunization (63.3%), and social and cultural conditions are considered poor for more than half of the respondents (57.8%). It is explained that half of the respondents are in the early adult age group (26-35 years old), and almost half of them have completed education up to junior high school. The majority of respondents in this study have the occupation of being a housewife.

The table 2 below shows that out of 79 respondents with low knowledge level, 76 of them (92.6%) did not complete basic immunization, and 3 respondents (7.4%) completed basic immunization. The chi-square statistical test resulted in a p-value of 0.000 ($p < 0.05$), indicating a significant relationship between the mother's knowledge level and the provision of basic immunization. Similarly, based on Table 2 out of 84 respondents with unsupportive family support, there are 71 respondents (84.2%) who did not complete basic immunization and 13 respondents (15.8%) who completed basic immunization. The chi-square statistical test resulted in a p-value of

0.000 ($p < 0.05$), indicating a significant relationship between family support and the provision of basic immunization.

Table 2. Bivariate Analysis of Complete Basic Immunization in Toddlers

Variabels	Basic Immunization				Total F	P value	PR (95%CI)
	Incomplete		Complete				
	f	%	f	%			
Knowledge Level of Mother's							
Low	76	92,6	3	7,4	79	0,000	4,702 (1.669 - 13.245)
High	8	19,4	45	80,6	53		
Fathers Support							
Not Supportive	71	84,2	13	15,8	84	0,000	9,296 (3.037 - 28.452)
Supportive	13	27,3	35	72,7	48		
Social and Cultural Conditions							
Poor	61	80,8	15	19,2	76	0,000	6,296 (1.021 - 20.123)
Good	23	39,5	33	60,5	56		
Mother's Age							
Late Adolescents (17-25 years)	12	14,3	12	85,7	24	0,082	2,344 (0,898 - 6,6114)
Early Adults (26-35 years old)	40	47,6	32	52,4	72		
Late Adults (36-45 years old)	32	38,1	4	8,3	36		
Mother's Education							
Elementary School	20	23,8	7	14,5	27	0,028	2,875 (1,121 - 7,371)
Junior High School	30	35,7	23	47,9	53		
High School	15	17,8	11	22,9	26		
College/University	19	22,7	7	14,7	26		
Mother's Occupation							
Housewife	60	71,4	28	58,3	88	0,028	3,270 (1,137 - 9,403)
Farmer	10	11,9	6	12,5	16		
Private Employee	6	7,1	9	18,7	15		
Civil Servant	8	9,6	5	10,5	13		
Total	84	63,3	48	36,7	132		

Furthermore, based on Table 2 out of 76 respondents with poor sociocultural backgrounds, 61 respondents (80.8%) did not complete basic immunization, and 15 respondents (19.2%) completed basic immunization. The chi-square statistical test resulted in a p-value of 0.000 ($p < 0.05$), indicating a significant relationship between sociocultural background and the provision of basic immunization.

Table 3. The result of the bivariate logistic regression test selection for independent variables with Complete Basic Immunization

Variable	B	Wald	P value	OR	95%CI
Fathers Support	2,230	15,259	0,000	9,296	3,037 - 28,452
Mother's Age	0,852	3,031	0,082	2,344	0,898 - 6,6114
Mother's Education	1,056	4,831	0,028	2,875	1,121 - 7,371
Mother's Occupation	1,185	4,835	0,028	3,270	1,137 - 9,403
Knowledge Level of Mother's	1,548	8,584	0,000	4,702	1,669 - 13,245
social and cultural	2,010	10,329	0,000	6,296	1,021 - 20,123

The results of the first multivariate modeling analysis can be seen in Table 3. The results of the multivariate modeling analysis indicate that there are several variables with P-values > 0.05 , which should be gradually removed from the model, starting with the variable with the highest P-value. The variables that were sequentially removed are age and occupation.

Table 4. Final Multivariate Modeling Results

Variable	B	Wald	P value	OR	95%CI
Father Support	1,996	14,217	0,000	7,359	2,608 - 20,767
Mother's Education	1,114	5,785	0,016	3,045	1,229 - 7,545
Knowledge Level of Mother's social and cultural	1,351	6,801	0,000	3,861	1,399 - 10,656
	1,807	13,135	0,000	6,092	2,293 - 16,186

The final modeling results in the multivariate analysis can be seen in Table 4. The results of the multivariate analysis show that variables significantly associated with Complete Basic Immunization are father support, educational level, knowledge level, and Sociocultural factors. The final multivariate modeling results also indicate that children with low father support have 7.3 times higher chances of not receiving complete immunization compared to those with high father support. Toddler with supportive sociocultural backgrounds have a 6 times greater chance of receiving complete basic immunization compared to toddler's with unsupportive sociocultural backgrounds. Father support has the highest Odds Ratio (OR) value, indicating that it is the most influential variable in Complete Basic Immunization. Therefore, it can be concluded that father support is the most significant factor affecting the completeness of basic immunization. Nevertheless, the four variables in the final model greatly contribute to the completeness of children's basic immunization, making these four aspects essential considerations in recommendations to enhance complete basic immunization coverage.

Discussion

Factors that have an impact as well as those that do not have an impact on incomplete basic immunization can be explained as follows: Age is one of the primary characteristic traits of individuals, and it has a close relationship with various other traits of people, as well as with place and time. Based on the analysis of the influence of maternal age on toddler's immunization completeness, there is no significant impact of maternal age on the completeness of immunization. The findings of this research align with previous studies, indicating no association between the age of mothers with toddlers and infant immunization status.^{3,31} However, some researchers explain that as maternal age increases to a certain extent, it can enhance the mother's child-rearing experience, which in turn affects efforts to prevent and address disease occurrence. Yet, the age of mothers with toddlers is not a causative factor for immunization completeness; multiple factors contribute, including education level. Education, which encompasses the knowledge gained through formal education, observation, and acquired information, plays a role in shaping a mother's understanding. With knowledge, individuals can make changes that lead to behavioral development. All activities performed by mothers regarding infant immunization stem from education.^{3,21}

Based on the analysis of the influence of maternal education level on toddlers' immunization completeness, a significant impact exists between maternal education level and the completeness of immunization in infants or toddlers. Hence, education can influence maternal knowledge, as mothers with higher education levels tend to have access to more information compared to those with lower education levels. One of the factors that influence immunization is the mother's level of knowledge. Knowledge about immunization affects the mother's motivation to immunize her baby correctly according to the scheduled plan. Reasons for lack of information include the mother's lack of knowledge about the necessity, completeness, and schedule of immunization, fear of immunization, and misconceptions circulating in society about immunization. Lack of awareness of the appropriate time for the next immunization and fear of side effects also play a role. This data shows that knowledge plays a crucial role in infant immunization.²⁸

This research is regarding factors related to maternal actions in immunization in the working area of the Bajeng Public Health Center, Bajeng District, Gowa Regency. The study found a relationship between knowledge level (p -value = 0.001) and completeness of basic immunization. Another study by Ismet (2013) on the analysis of factors related to compliance with immunization for toddlers in Botubarani Village, Kabila Bone District, Bone Bolango Regency, found a relationship between maternal knowledge (p -value = 0.024).²¹ The researcher assumes that there is a relationship between maternal knowledge and the administration of basic immunization in the working area of the Bosua Public Health Center, Kepulauan Mentawai Regency. It is observed that the higher the level of knowledge possessed by the mother, the more likely she is to provide complete basic immunization.

This research is where factors related to the completeness of children's basic immunization and vaccine management in Public Health Centers and Integrated Health Posts in Beji District, Depok City, showed a relationship with family support (p -value = 0.004). A study by Riri Novia Sumantri in 2017 on the influence of maternal characteristics, distance, family support, and health worker support on the completeness of basic immunization in babies found a relationship with family support (p -value = 0.002).⁴

Family is the most important primary group in society, and parents or family members are not only the first environment since birth but also the longest environment experienced. The parent-child relationship should be nurtured from an early age because it is a learning process, where individuals always imitate or repeat what they have learned in that process.^{15,32,33} Support is a state where benefits for an individual are derived from others who can be trusted, so that one knows there are others who pay attention, value, and care for them. Family support is an integral part of social support.^{34,35} Paternal support strengthens the participation in immunization implementation by reminding the immunization schedule for their babies, clarifying that a child's fever is a reaction

to immunization and not a harmful condition, and not a contraindication for subsequent immunizations.^{36,37}

The results of this study indicate that the majority of fathers provide good support within their families, acting as decision-makers, protecting from dangers or risks, and offering motivational support to their wives. Some respondents have adequate support, while fathers who provide insufficient support do not participate in taking care of the child when they are sick. The forms of support provided by fathers include encouragement, advice, monitoring daily eating patterns, and medical care. Providing basic immunization for children should be based on a strong understanding from parents about immunization as an effort to maintain a child's health through disease prevention. Therefore, parents are expected to realize and possess a positive understanding of immunization.^{24,38,39}

Conclusion

The study concluded that there is a relationship between complete immunization and the level of knowledge, father support, and sociocultural factors. In the multivariate analysis, the most influential factor on complete basic immunization is father support. Advice for healthcare workers to provide education to families, especially fathers, about the importance of giving their toddlers at least the basic immunizations : Build rapport, Understand their concerns, Explain the benefits, Use simple language, Share success stories, Provide visual aids, and Address safety concerns.

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Conflict of Interest

There is no conflict of interest in the making of this journal.

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