



Analysis of Factors Affecting Low Measles Rubella Immunization Coverage During School Children Immunization Month in Elementary Schools in Center Area, Padang

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Abstract

Measles Rubella (MR) immunization is a vaccine aimed at preventing measles and rubella. MR are infectious diseases that can affect anyone, both children and young adults, and can cause serious health problems. These diseases can lead to severe complications such as pneumonia, encephalitis, congenital defects, and even death. Despite being an effective preventive measure, MR immunization coverage has shown a significant decline in recent years, from 88% in 2022 to only 42.4% in 2024. In Padang City, the MR immunization coverage among grade 1 students in 2024 were only 33.1%, far below the national target of 90%. This study aimed to analyze the factors influencing the low coverage of MR immunization in Padang City. This research employed a quantitative approach with a cross-sectional design. The total sample consisted of 136 respondents, specifically mothers who have children enrolled in grade 1 of elementary school. The sampling technique used was simple random sampling. Data were collected through structured questionnaires and analyzed using chi-square statistical tests to identify relationships between variables. The results indicated a significant relationship between attitude, belief, and family support with MR immunization coverage. In contrast, there was no significant relationship between knowledge, health worker support, and community leader support. Among all analyzed variables, belief (22.962), family support (5.606), and attitude (7.148) had the strongest influence on immunization coverage. Therefore, it is recommended that the Health Office and Nanggalo Health Center enhance targeted health promotion strategies and community engagement to improve Measles Rubella immunization coverage.

Keywords: Measles, Rubella Vaccine, Immunization Coverage, Family Support.

INTRODUCTION

Immunization is one of the most effective public health interventions for preventing infectious diseases and reducing morbidity and mortality, particularly among children (World Health Organization, 2024). In Indonesia, this effort is governed by the Regulation of the Minister of Health No. 12 of 2017, which outlines the implementation of basic, follow-up, and school-age immunization programs. One of the key initiatives under this regulation is the School Children Immunization Month (BIAS) program, designed to strengthen children's immunity against vaccine-preventable diseases such as measles, rubella, diphtheria, and tetanus (Ministry of Health of the Republic of Indonesia, 2023). Therefore, achieving optimal MR immunization coverage among school-aged children remains a key priority in public health efforts.

Rania Suilia, et al., Analysis of Factors Affecting....



However, global immunization coverage has not yet fully recovered following the COVID-19 pandemic. Reports from WHO and UNICEF (2024) indicate that approximately 18 million children worldwide have not received basic immunizations, and more than 61 million doses of measles and rubella vaccines were delayed in distribution. This situation has contributed to a 20% increase in global measles cases in 2023, reaching an estimated 10.3 million cases. Southeast Asia has been identified as one of the region's most significantly affected by declining coverage of the first and second doses of measles-containing vaccines (MCV1 and MCV2) coverage (WHO & UNICEF, 2024).

In Indonesia, however, efforts to restore immunization rates have shown positive progress. According to the Ministry of Health (2023), national basic immunization coverage reached 94.9%, nearing the national target of 95%. Nevertheless, MR immunization among school-age children remains inconsistent across provinces. The Indonesia Health Profile (2024) noted an 82.1% MR coverage rate – an improvement from 74.4% in 2023 but still below the expected threshold.

A similar situation is observed in West Sumatra Province, where MR immunization coverage remains below the minimum target of 90%. In Padang City, MR immunization coverage among first-grade elementary school students has fluctuated and tended to remain low over recent years. The 2024 Annual Report of the Padang City Health Office reported MR coverage of only 33.1% based on manual reporting (PWS) and 17.6% in the ASIK system, despite sufficient vaccine availability and logistical support (Padang City Health Office, 2025). Among all community health centers in Padang City, the Nanggalo Community Health Center recorded the lowest MR immunization coverage at 19.37%, far below the established target.

Preliminary interviews with immunization officers revealed that low MR immunization coverage in the Nanggalo area was not primarily caused by service limitations or vaccine shortages (Padang City Health Office, 2025). Instead, parental hesitancy emerged as the dominant barrier, driven by concerns regarding vaccine safety, religious permissibility, and widespread misinformation disseminated through social media (Hasibuan & Sinambela, 2023). Additionally, limited parental knowledge regarding the benefits and importance of MR immunization further contributes to low participation in school-based immunization programs (Harahap et al., 2023).

From a theoretical perspective, parental decision-making related to childhood immunization is influenced by cognitive and psychosocial factors embedded in constructs of the Health Belief Model, including perceived threat, benefits, barriers, and cues to action (Handayani et al., 2025). The Health Belief Model posits that health behaviors such as immunization uptake are shaped by individuals' perceptions of disease susceptibility and severity, perceived benefits and barriers of the action, and external cues that trigger decision-making, with perceived benefits and barriers shown to significantly influence parents' intentions to vaccinate their children (Handayani et al., 2025). Within the context of immunization, parental knowledge, attitudes, beliefs, and social support play a crucial role in determining immunization acceptance (Nurstifani et al., 2022). Previous studies have demonstrated that parents' perceptions of vaccine safety and benefits are significantly associated with children's immunization status (Hasibuan & Sinambela, 2023). Other studies also reported significant associations between parental knowledge and attitudes and MR immunization coverage (Harahap et al., 2023; Nurstifani et al., 2022). Furthermore, support from family members, health workers, and community and religious leaders has been identified as a reinforcing factor that enhances participation in immunization programs (Putri & Putri, 2022; Salleh et al., 2023).

Although numerous studies have examined determinants of MR immunization, limited research has comprehensively analyzed parental knowledge, attitudes, beliefs, exposure to misinformation, and social support simultaneously within school-based immunization settings (Salleh et al., 2023). This gap is particularly evident in areas with persistently low immunization coverage and at the level of primary health care services (Putri & Putri, 2022).



Therefore, this study aims to analyze factors associated with low measles-rubella immunization coverage during the School Children Immunization Month (BIAS) in the working area of the Nanggalo Community Health Center in 2024 (Padang City Health Office, 2025). The variables examined include parental knowledge, attitudes, beliefs regarding immunization, exposure to misinformation, and social support (Harahap et al., 2023). The findings of this study are expected to provide evidence-based recommendations for targeted intervention strategies to improve MR immunization coverage through school-based immunization programs (WHO, 2024).

METHODS

The research method used by the researcher in this study was a of quantitative methods with a cross-sectional approach. This study was conducted on mothers who had children attending four elementary schools in the working area of the Nanggalo Community Health Center in 2025. The study was conducted from January 2025 to July 2025. The population in this study were parents of first-grade elementary school children in the working area of the Nanggalo Community Health Center in Padang City. The population size was 207 people. The sampling technique used in this study was simple random sampling, and the sample size was calculated using the Slovin formula, where the population size was known (Widodo, 2019). The number of samples in each of the four elementary schools in the working area of the Nanggalo Community Health Center was 136 parents of students who met the research criteria. Inclusion criteria: Mothers were willing to be respondents in the study, mothers who had children in the first grade of elementary school, mothers were able to communicate well, children lived with their mothers in the working area of the Nanggalo Community Health Center.

These questionnaires have been adopted by several studies that have tested their validity and reliability. The knowledge questionnaire consisted of 15 multiple-choice items assessing mothers' knowledge of immunization. Validity was tested using Pearson Product Moment correlation ($r > 0.361$), and reliability testing showed a Cronbach's alpha of 0.930, indicating excellent reliability. Knowledge scores were categorized as good (8-15 correct answers) and poor (0-7 correct answers). The attitude instrument included 12 items measured using a Guttman scale. Validity testing showed r values > 0.443 , and reliability testing resulted in a Cronbach's alpha of 0.893. Attitudes were categorized as supportive (≥ 6) and non-supportive (< 6). The trust questionnaire consisted of 8 items, with validity coefficients ranging from 0.649 to 0.857 and Cronbach's alpha > 0.780 . Trust was categorized as good (≥ 5) or poor (< 5). The family support instrument comprised 9 items, with reliability indicated by a Cronbach's alpha of 0.748. Family support was classified as supportive (≥ 5) or non-supportive (< 5). The health worker support questionnaire consisted of 12 items, with validity coefficients ranging from 0.298 to 0.691 and a Cronbach's alpha > 0.698 . Support was categorized as good (≥ 6) or poor (< 6).

Before distributing the questionnaires, the researchers first submitted the research ethics proposal to the Faculty of Nursing, Andalas University. During the research, the researchers adhered to the principles of research ethics, which include: Autonomy: respondents were given complete freedom to participate or refuse. Beneficence: the research was conducted to benefit the development of nursing science and practice. Non-maleficence: the researchers ensured that there were no risks or dangers to the respondents. Veracity: all research information was conveyed transparently. After the respondents received an explanation of the objectives, benefits, and procedures of the research and expressed their willingness to participate, they were asked to sign an informed consent form.

Before the research was conducted, the researchers explained the objectives, benefits, and procedures of the research to the respondents while still observing health protocols. Data analysis in this study includes univariate analysis, which is used to describe the frequency distribution and proportion of each variable presented in tabular form. Bivariate analysis was used to explain the relationship between the dependent and independent variables. Multivariate analysis used three or more variables to analyze which independent variables were the strongest and most influential on the dependent variable using a logistic regression test.



RESULTS**Respondent Characteristics**

Respondent characteristics are shown in Table 1 below:

Table 1. Respondent Characteristics		
Respondent Characteristics	f	%
Mother's age		
< 35 years	76	55,9
≥ 35 years	60	44,41
Mother's education		
High	80	58,8
Low	56	41,2
Mother's occupation		
Working	53	39,0
Not working	83	61,0

Table 1 illustrates the demographic characteristics of respondents, showing that the majority of mothers were under 30 years old (55.9%), had a higher level of education (58.8%), and were not employed (61.0%). An overview of the predisposing and reinforcing factors related to Measles Rubella (MR) immunization coverage—including aspects of knowledge, attitudes, beliefs, family support, health worker support, and community leader support—is presented in Table 2 below.

Table 2. Influencing factors		
Influencing factors	f	%
Knowledge		
Good	98	72,1
Poor	38	27,9
Attitude		
Supportive	55	40,4
Not supportive	81	59,6
Belief		
Good	42	30,9
Poor	94	69,1
Family Support		
Supportive	55	40,4
Not supportive	81	59,6
Health Worker Support		
Good	91	66,9
Poor	45	33,1
Community Leader Support		
Supportive	62	45,6
Not supportive	74	54,4

Table 2 shows that for maternal predisposing factors, maternal knowledge is good (72.1%), maternal attitude is not supportive (59.6%), and maternal confidence is good (69.1%). Maternal reinforcing factors are unsupportive family support (59.6%), good health worker support (100%), and supportive community leader support (92.6%). Measles Rubella immunization coverage, where mothers did not provide immunization was 73.5% and those who provided it was 26.5%.



Tabel 3. Chi Square Analysis

Factors		Measles Rubella Immunization Coverage				P Value
		Yes		No		
		f	%	f	%	
Knowledge						
	Good	25	18,4	73	53,7	0,684
	Poor	11	8,1	27	19,9	
Attitude						
	Supportive	28	20,6	27	19,9	0,000
	Not supportive	8	5,9	73	53,7	
Belief						
	Good	29	21,3	13	9,6	0,000
	Poor	7	5,1	87	64,0	
Family Support						
	Supportive	28	20,6	27	19,9	0,000
	Not supportive	8	5,9	73	53,7	
Health Worker Support						
	Good	27	19,9	64	66,9	0,229
	Poor	9	6,6	36	26,5	
Community Leader Support						
	Supportive	21	15,4	41	30,1	0,073
	Not supportive	15	11	59	43,4	

Table 3 shows that of the 136 mothers who did not provide Measles Rubella immunization, the predisposing factors were good maternal knowledge (53.7%), unsupportive maternal attitude (53.7%), and low maternal confidence in immunization (64%). The chi-square test results for the attitude variable yielded a $p < 0.000$ and for the belief variable a $p < 0.000$ ($p < 0.05$), thus concluding that there is a relationship between maternal attitude and belief and low Measles Rubella immunization coverage. Meanwhile, for the belief variable, the p-value was 0.684 ($p > 0.05$), so it was concluded that there was no relationship between knowledge and low Measles Rubella immunization coverage. As for the supporting factors for mothers, 53.7% of mothers had unsupportive families, 66.9% had good support from health workers, and 43.4% had unsupportive community leaders. The chi-square test results for the family support variable yielded a $p < .000$ ($p < 0.05$), leading to the conclusion that there is a relationship between family support and Measles Rubella immunization coverage. The health worker support variable obtained a $p < 0.229$ and community leader support obtained a $p < 0.073$ ($p > 0.05$), thus concluding that there is no relationship between health worker support and community leader support with Measles Rubella Immunization Coverage.

Multivariate analysis is an analysis to determine the most dominant factors influencing Measles Rubella Immunization. Based on Table 3, it shows that the variables of attitude, trust, family support, health worker support, and community leader support obtained a p-value < 0.25 , so they can proceed to the multivariate analysis stage.

The results of the multivariate test with logistic regression are shown in Table 4 below:

Table 4. Multivariate Test Results with Logistic Regression in the Second Stage

Respondent Characteristics	%	Exp (B)
Attitude	0,002	8.474
Belief	0,000	23.287
Family Support	0,001	10.021
Community Leader Support	0,075	2.943

Based on Table 4, the multivariate test results show that the variables with significant results ($p < 0.05$) are attitude, trust, and family support. These factors are the dominant factors influencing measles-rubella immunization. The results also show that the factor of maternal confidence has the greatest influence on measles-rubella immunization, with a confidence level 22.962 times greater than other factors, followed by family support at 9.828 times and maternal attitude at 7.148 times.

DISCUSSION

The results of the chi-square test examining the association between mothers' knowledge and Measles Rubella (MR) immunization showed a p-value of 0.684, indicating no statistically significant association between maternal knowledge level and MR immunization coverage among elementary school children in the working area of the Nanggalo Health Center. Although most respondents had good knowledge (72.1%), while 27.9% had poor knowledge, this variable was not significantly associated with immunization status. This finding is consistent with Nursal (2023), who reported that adequate knowledge alone is not necessarily associated with health-related behavior. Parents may possess sufficient information about immunization but still exhibit hesitancy due to other contextual factors such as family influence, misinformation, or cultural beliefs. Hasibuan and Sinambela (2022) also reported that media exposure, logistical constraints, and limited social support may have a stronger association with immunization decisions than cognitive understanding alone.

In contrast, maternal attitude showed a statistically significant association with MR immunization uptake ($p < 0.001$). In this study, 40.4% of mothers demonstrated supportive attitudes, while 59.6% showed non-supportive attitudes. Mothers with non-supportive attitudes tended to perceive MR immunization as unnecessary or potentially harmful, often expressing concerns about side effects such as fever or post-vaccination discomfort. These findings are in line with Novita et al. (2024), who reported that negative attitudes are commonly associated with misconceptions, limited exposure to accurate information, and social influences. Attitude reflects an evaluative and emotional dimension that is closely associated with mothers' readiness to accept immunization, highlighting the importance of appropriate and culturally sensitive health communication.

Maternal belief was also found to be significantly associated with MR immunization status ($p < 0.001$). The majority of respondents (69.1%) reported low levels of trust in immunization. This lack of trust was commonly related to misinformation circulating in the community, including concerns about vaccine safety and halal status. This finding supports previous studies by Harahap et al. (2023), which showed a significant association between parental belief and childhood immunization status. According to Green (in Irwan, 2020), belief systems are predisposing factors that are closely associated with health-related behaviors, suggesting that strengthening positive beliefs may support better immunization acceptance.

Family support also demonstrated a statistically significant association with MR immunization coverage ($p < 0.001$). In this study, 40.4% of mothers reported receiving family support, while 59.6% did not. Mothers who lacked family support were less likely to immunize their children, indicating that family attitudes and opinions are closely associated with immunization decisions. This finding aligns with Ishak (2024), who reported that family encouragement is strongly associated with immunization completeness. Conversely, negative perceptions or concerns within the family may act as barriers to immunization uptake (Yoselina et al., 2023). These results highlight the importance of involving family members in immunization education and counseling.

On the other hand, support from health workers was not significantly associated with MR immunization coverage ($p = 0.229$). Although most respondents (66.9%) perceived health worker support as good, this variable did not show a significant statistical association with immunization status. This finding is consistent with Rahmi and Husna (2024), who noted that while health workers are important sources of information, their influence may be moderated by other factors such as family beliefs and



community norms. This suggests that health promotion efforts should be integrated with broader community and family-based approaches (Hanifah et al., 2023).

Similarly, support from community leaders was not significantly associated with MR immunization coverage ($p = 0.073$). Although 45.6% of respondents perceived support from community figures, this support was not statistically associated with immunization behavior. Previous studies suggest that the role of community leaders may become more influential when combined with consistent health messaging and collaboration with health services (Putri & Putri, 2022). Green (in Irwan, 2020) emphasized that community figures can function as reinforcing factors when actively engaged in health promotion initiatives.

An in-depth multivariate analysis identified belief, family support, and attitude as the most dominant factors influencing MR immunization. Maternal belief emerged as the strongest predictor, with an Exp(B) value of 22.962, followed by family support ($\text{Exp(B)} = 9.828$) and attitude ($\text{Exp(B)} = 7.148$). This indicates that mothers with strong positive beliefs are over 22 times more likely to vaccinate their children compared to those with weak beliefs. These results underscore the central role of psychological and social factors in shaping health behavior. Efforts to improve MR immunization coverage should therefore focus not only on disseminating information but also on building trust, emotional readiness, and community-based reinforcement through family and religious engagement. In the bivariate analysis, maternal attitude, belief, and family support were significantly associated with MR immunization status. However, in the multivariate analysis, only belief, family support, and attitude remained significantly associated after controlling for other variables. This indicates that the associations observed in the bivariate analysis were partially influenced by interactions among independent variables. Variables that were significant in the bivariate analysis but lost significance in the multivariate model may act as confounding factors. Therefore, the multivariate findings provide a more comprehensive understanding of factors associated with MR immunization, while confirming that the observed relationships reflect associations rather than causal effects due to the cross-sectional study design.

CONCLUSION

Based on the results of the study on the analysis of factors influencing the administration of measles rubella immunization during the school immunization month at elementary schools in the Nanggalo Community Health Center working area. This study shows that maternal belief, attitude, and family support were associated with the provision of measles-rubella (MR) immunization. In contrast, maternal knowledge, health worker support, and community leader support were not significantly associated with MR immunization status. These findings indicate that psychosocial and family-related factors are more closely associated with MR immunization uptake than informational or external support factors alone. Given the cross-sectional design of the study, the results reflect associations rather than causal relationships. Strengthening positive beliefs, supportive attitudes, and family involvement may be important considerations in efforts to improve MR immunization coverage in school-based immunization programs.

Recommendations for mothers and families are to optimize socialization and counseling activities by health workers and community leaders for mothers and families. For future researchers, it is hoped that further research can explore more deeply all the factors that influence the administration of measles-rubella immunization during the school immunization month, and that future researchers can focus on in-depth analysis. For educational institutions, it is hoped that this research can be used as a source of information to increase knowledge and decision-making, particularly on factors influencing the administration of measles-rubella immunization in school children. For elementary schools involved in this research, it can open up opportunities to better understand the perspectives of parents through the collection of data and insights from parents of students.

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