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Factors related to mothers' compliance with MR immunization

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Abstract

The Measles–Rubella (MR) vaccine is a combined vaccine intended to prevent measles and rubella, two infectious diseases that can cause serious health complications in children and women of reproductive age. Despite the national MR immunization program, coverage remains suboptimal in several areas. Data from the Tuan Tuan Community Health Center, Benua Kayong District, in 2018 showed that during School Children Immunization Month (BIAS), only 281 out of 767 elementary school students received the MR vaccine, and five elementary schools refused MR immunization due to parental considerations. This study aimed to analyze factors associated with maternal compliance with MR immunization among elementary school students in the working area of the Tuan Tuan Community Health Center, Ketapang Regency. This study employed an analytical cross-sectional design. The sample consisted of 106 parents of first-grade elementary school students in Tuan Tuan Village, Benua Kayong District, Ketapang Regency. Samples were selected using simple random sampling, with proportional sampling applied to each elementary school. Data were collected using a structured questionnaire and analyzed statistically. The results showed that maternal age was significantly associated with MR immunization compliance, while maternal occupation, socioeconomic status, and maternal knowledge were not associated with compliance. Environmental support was found to have a significant relationship with maternal compliance with MR immunization. In conclusion, maternal age and environmental support were factors associated with maternal compliance with MR immunization among elementary school students in Tuan Tuan Village. Strengthening environmental support and targeted health education may improve MR immunization coverage in this area.

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INTRODUCTION

The Measles–Rubella (MR) vaccine is a combination vaccine designed to prevent measles and rubella (Lienaningrum, & Kristina, 2020; Junaidi et al., 2022; Gusrina et al., 2024). MR immunization is administered to children aged 9 months to under 15 years and has been incorporated into the routine basic immunization schedule for infants (Kroger, et al., 2011; Vashishtha et al., 2014). In addition, the MR vaccine may also be given to healthy adults who are not pregnant (Jannah, 2015). The primary objective of MR immunization is to protect children and women of reproductive age from measles and rubella and to reduce morbidity, disability, and mortality associated with these diseases.

Measles and rubella are highly contagious viral diseases transmitted through the respiratory tract, primarily via coughing and sneezing (Leung et al., 2018; Khongthaw, & Geetha, 2022). Measles symptoms typically appear around 10 days after infection, followed by the emergence of a reddish-brown rash approximately 14 days post-infection. Clinical manifestations include high fever, rash, cough, runny nose, and conjunctivitis, which may lead to severe complications such as pneumonia, diarrhea, meningitis, and death. Although rubella is generally mild in children, infection during the first trimester of pregnancy can result in miscarriage or Congenital Rubella Syndrome (CRS), characterized by congenital heart disease, cataracts, deafness, and developmental delays (Kementerian Kesehatan Republik Indonesia, 2017). In Indonesia, 83 confirmed CRS cases were reported between 2015 and 2016, with the majority suffering from cardiac defects, cataracts, and hearing impairment (Direktorat Jenderal Pengendalian Penyakit dan Kesehatan Lingkungan, 2017).

Epidemiological data indicate that measles and rubella remain significant public health problems in Indonesia. Between 2010 and 2015, approximately 23,164 measles cases and 30,463 rubella cases were reported, with laboratory confirmation rates ranging from 12–39% for measles and 16–43% for rubella (Kementerian Kesehatan Republik Indonesia, 2017). These figures likely represent an iceberg phenomenon, suggesting that the actual incidence is considerably higher. In response, the Global Vaccine Action Plan (GVAP) targeted measles elimination by 2020 through increased community immunity via high MR vaccine coverage. The MR immunization campaign was first implemented in 2017 in Java with 95% coverage, followed by implementation outside Java, including West Kalimantan, in 2018; however, coverage declined to 66.9%, and cases of parental refusal persisted.

Parental compliance is a critical determinant of immunization program success. Immunization coverage in Indonesia has not yet consistently reached the expected 80–100% target, largely due to parental hesitancy and refusal (Achmadi, 2006). The success of immunization programs depends on technical and organizational health service factors, such as vaccine availability, accessibility, and workforce readiness, as well as community acceptance, trust, cultural beliefs, and social norms. WHO defines vaccine hesitancy as the delay in acceptance or refusal of vaccines despite availability, a phenomenon influenced by trust in government, vaccine safety, social support, and information sources. International evidence, including a major measles outbreak in Ukraine in 2018, demonstrates that low public trust and concerns about vaccine safety can significantly undermine immunization programs.

Previous studies have identified multiple factors influencing MR immunization compliance, including parental perceptions, age, occupation, socioeconomic status, knowledge, and environmental support. Research by Prabandasari et al. (2018) demonstrated that parental perceptions of disease severity, benefits, and barriers were significantly associated with MR immunization uptake. Other studies reported significant associations between maternal age and occupation, maternal knowledge, environmental supporz, and household income with immunization completeness. However, data from the Tuan Tuan Community Health Center in Benua Kayong District revealed persistently low

MR immunization coverage (36.6%) and continued refusal in several elementary schools despite prior health education efforts. This indicates a gap between existing knowledge and local contextual factors influencing maternal compliance, particularly in school-based MR immunization programs in rural areas. Therefore, the novelty of this study lies in its comprehensive analysis of maternal compliance factors within a low-coverage setting following health education interventions. This study aims to analyze factors associated with maternal compliance with MR immunization among elementary school students in the working area of the Tuan Tuan Community Health Center, Ketapang District.

METHOD

This study employed an analytical cross-sectional design to examine factors associated with maternal compliance with Measles–Rubella (MR) immunization among elementary school students at Tuan Tuan Elementary School, Benua Kayong District, Ketapang Regency. In this design, the independent and dependent variables were measured simultaneously at a single point in time.

The study population consisted of 106 mothers who had children enrolled at Tuan Tuan Elementary School. A sample of 51 respondents was selected using a simple random sampling technique to ensure that each member of the population had an equal opportunity to be included in the study.

Data were collected using a structured questionnaire that included items related to maternal age, occupation, socioeconomic status, knowledge of the MR vaccine, and environmental support related to MR immunization. The questionnaire used multiple-choice questions. Each correct response was assigned a score of one, while incorrect responses were assigned a score of zero. Prior to data collection, the researchers explained the purpose and objectives of the study to all respondents. Written informed consent was obtained from each participant to ensure voluntary participation and adherence to ethical research principles.

Data analysis consisted of univariate analysis to describe the frequency distribution of respondents' characteristics, including age, occupation, socioeconomic status, knowledge of the MR vaccine, and environmental support. Bivariate analysis was subsequently conducted to determine the association between these factors and maternal compliance with MR immunization.

RESULTS AND DISCUSSION

Table 1. Frequency Distribution of Factors: Age, Occupation, Socioeconomic Status, Knowledge, Environmental Support, and Mothers' Compliance with MR Immunization in Elementary Schools in Tuan-Tuan Village, Benua Kayong District, Ketapang Regency, 2019.

Variable	Frequency (∑)	Percentage
Age		
Early Adult	26	51.0
Late Adult	25	49
Occupation		
Working	44	86.3
Not working	7	13.7
Socioeconomic		
High	6	11.8
Low	45	88.2
Knowledge		
Good	40	78.4
Fair	0	0.00

Poor	11	21.6
Environmental Support		
Support	29	56.9
Not Supported	22	43.1
Compliance Mothers to MR Immunization		
Compliant	6	11.8
Non-Compliant	45	88.2
Total	51	100

Based on Table 1, more than half of the respondents were young adults, namely 26 people (51.0%), most of the respondents were unemployed, namely 44 people (86.3%), most respondents had low socioeconomic status, namely 45 people (88.2%), most respondents had good knowledge about MR immunization, namely 40 people (78.4%), more than half of the respondents received support from their environment regarding compliance with MR immunization, namely 29 people (56.9%), and only a small portion of respondents complied with MR immunization, namely 6 people (11.8%).

Table 2. Results of Bivariate Analysis

Variable		**MR Immunization Compliance**				**Number**		***p-value***
		Compliant		**Non-compliant**				
		(n)	**(%)**	**(n)**	**(%)**	**(n)**	**(%)**	
Age	Early adulthood	6	11.8	20	39.2	26	51.0	0.023
	Late adulthood	0	0	25	49.0	25	49.0	
	Total	6	11.8	45	88.2	51	100	
Employment	Not working	4	7.80	40	78.4	7	86.3	0.186
	Working	2	3.90	5	9.80	44	13.7	
	Total	6	11.8	45	88.2	51	100	
Socioeconomic	High	1	2.00	5	9.80	6	11.8	0.548
	Low	5	9.80	40	78.4	45	88.2	
	Total	6	11.8	45	88.2	51	100	
Knowledge	Good	5	9.80	35	68.6	40	78.4	1.000
	Poor	1	2.00	10	19.6	11	21.6	
	Total	6	11.8	45	88.2	51	100	
Environmental Support	Support	6	11.8	23	45.1	29	56.9	0.031
	No Support	0	0.00	22	43.1	22	43.1	
	Total	6	11.8	45	88.2	51	100	

Based on Table 2, the results of the Chi-square test show a p-value of 0.023, which is lower than the significance level of 0.05. This indicates that the null hypothesis is rejected and the alternative hypothesis is accepted. Therefore, it can be concluded that maternal age is significantly associated with compliance with Measles–Rubella (MR) immunization among elementary school students in Tuan-Tuan Village, Benua Kayong District, Ketapang Regency, in 2019.

DISCUSSION

The results of this study differ from the findings of Prabandari & Kusumawati (2018), who reported no significant relationship between maternal age and acceptance of MR immunization. In her study, mothers who did not accept MR immunization were more common in the early adult age group, with statistical analysis showing no meaningful

association. Increasing age does not necessarily improve immunization compliance (Falagas, & Zarkadoulia, 2008). However, other studies have shown that younger parents often demonstrate greater interest in MR immunization due to higher exposure to health information and greater concern for child health.

Age is an important individual characteristic that is closely related to a person's experiences, cognitive development, and decision-making capacity (Morelli, Casagrande, & Forte, 2022). Younger parents tend to process new information more easily and are generally more receptive to health promotion messages. Parents who have recently had children are often more attentive to preventive health measures, including immunization (Ikawati, 2011). Conversely, increasing age may also enhance caregiving experience, which can influence disease prevention behaviors.

The analysis of maternal occupation in this study showed no significant relationship with compliance with MR immunization. This finding is consistent with the study by Prabandari & Kusumawati (2018), which reported no association between employment status and acceptance of MR immunization. Although unemployed mothers may have more time to care for their children, acceptance of MR immunization remains low due to other influencing factors. These factors include concerns about vaccine halal status, spousal opposition, and limited support from the surrounding environment.

In contrast, the findings of this study differ from Istriyati (2011), who reported a significant relationship between parental employment status and the completeness of basic immunization. Employment is closely related to income and access to information, which may affect health-related decisions (Notoatmodjo, 2012). Working mothers may face time constraints that limit their ability to attend immunization services. Meanwhile, non-working mothers may have more flexibility, although this does not always translate into higher immunization compliance.

Socioeconomic status in this study was not found to be significantly associated with MR immunization compliance. This result aligns with the study by Isnayni (2016), which found no relationship between family income and basic immunization status. Both higher- and lower-income families showed similar immunization behaviors. This suggests that factors beyond economic capacity may play a more dominant role in immunization decisions.

Economic status is generally believed to influence health behavior by affecting access to resources and health services (Notoatmodjo, 2012). Families with higher socioeconomic status are expected to have better access to health facilities and information. However, immunization programs are often provided free of charge, reducing financial barriers. Therefore, economic factors alone may not determine compliance with MR immunization.

The results of this study indicate that maternal knowledge was not significantly related to MR immunization compliance. This finding is inconsistent with studies by Prabandasari et al. (2018) and Pramitasari et al. (2017), which found a significant relationship between knowledge and immunization acceptance. Differences in study settings, population characteristics, and information sources may explain these discrepancies. In this study, knowledge alone may not have been sufficient to overcome doubts or misconceptions about the MR vaccine.

Knowledge is defined as the result of knowing after individuals perceive an object through their senses (Notoatmodjo, 2012). It is closely related to educational background, where higher education is expected to broaden knowledge and understanding. However, knowledge does not always translate into behavior change if it is not supported by positive attitudes and social reinforcement. Therefore, knowledge should be accompanied by trust and supportive environments to influence immunization behavior.

Environmental support was found to have a significant relationship with compliance with MR immunization in this study. This result indicates that family, community, and social influences play a crucial role in parental decision-making regarding immunization. Supportive

environments can strengthen positive attitudes and reduce doubts about vaccine safety. This finding highlights the importance of social reinforcement in public health interventions.

Environmental values and norms strongly influence individual behavior through internalization processes (Blass, 1999). Support from family members and peers can shape beliefs and perspectives about immunization. A supportive and communicative environment encourages acceptance of health programs, whereas a negative environment may lead to resistance. Therefore, strengthening community and family support is essential to improve MR immunization compliance.

CONCLUSION

Based on the results and discussion, it can be concluded that maternal age and environmental support are factors associated with compliance with MR immunization among elementary school children in the Tuan-Tuan Village area, Benua Kayong District, Ketapang Regency. In contrast, maternal occupation, socioeconomic status, and maternal knowledge were not found to be associated with MR immunization compliance. These findings indicate that individual characteristics and social environmental influences play a more significant role in determining immunization compliance than economic or occupational factors. Therefore, efforts to improve MR immunization coverage should focus on strengthening environmental support and targeting age-appropriate health education strategies for mothers.

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