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Original Research

Relationship between maternal knowledge and compliance with Measles-Rubella immunization

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ABSTRACT

Background: Measles and Rubella are significant health threats to children, which can be prevented through immunization. Despite the availability of the Measles-Rubella (MR) vaccine, its coverage remains insufficient. Lack of maternal knowledge is a major factor contributing to non-compliance with the vaccination schedule.
Objective: This study aims to assess the relationship between maternal knowledge and compliance with MR immunization for children under two years old.
Method: A quantitative study with a descriptive analysis was conducted, involving 34 mothers with children aged 24-36 months at Long Kali Community Health Center. The total sampling method was used, and data were collected through a validated Guttman-scale questionnaire. Chi-square tests were employed to analyze the relationship between maternal knowledge and immunization compliance.
Result: The study found that a significant proportion of mothers had poor knowledge (55.9%) about MR immunization. Furthermore, 70.6% of mothers were non-compliant with the MR immunization schedule. A significant association was identified between maternal knowledge and immunization compliance ($p < 0.05$).
Conclusion: Maternal knowledge significantly influences compliance with the MR immunization schedule. Efforts to increase awareness and understanding of MR immunization are crucial to improve vaccine uptake and protect children from preventable diseases.

1. Introduction

Measles is a highly contagious disease with severe complications that can potentially cause outbreaks or extraordinary events and even lead to death (Anggraini et al., 2017). The disease is caused by the measles virus, and its complications, including meningitis,

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pneumonia, and ear infections, can be prevented through immunization (Sato & Chatterjee, 2023).

Immunization is an effort to provide immunity to infants and children by introducing vaccines into the body to stimulate the production of antibodies that prevent specific diseases. Vaccines are substances used to induce the formation of antibodies and are administered through injections, such as Bacillus Calmette Guerin (BCG), DPT (Difteri, Pertusis, dan Tetanus), Hepatitis B, and Measles, or orally, such as polio (Anggraini et al., 2017).

MR (Measles-Rubella) immunization has gained increased attention in line with Indonesia's commitment to eliminating Measles and controlling Rubella (congenital Rubella syndrome) by 2020, with a target of achieving at least 95% coverage across all regions. It is important to address the fact that Measles remains a leading cause of child mortality, while Rubella leads to congenital defects in babies born to mothers infected with the virus. Preventing these two diseases plays a crucial role in reducing disability and mortality rates among young children. Although the trend of immunization in Indonesia has been declining, efforts continue to meet the minimum target of 95% coverage (Direktorat Jenderal Pencegahan dan Pengendalian Penyakit [Ditjen P2P], 2018).

The strategy for eliminating Measles is through the administration of the MR Booster immunization. The success of the MR Booster program is not only the responsibility of healthcare professionals but also of the parents (Prashanth et al., 2023). Booster immunization is a repeat of the basic immunization to maintain immunity levels and extend the protection period for children who have received basic immunization. This involves administering one dose of DPT-HB-Hib at 18 months and one dose of Measles/MR at 24 months. Optimal protection from booster immunization can only be achieved if the child has completed the basic immunization series (Ministry of Health – Republic of Indonesia, 2021). In 2020, the coverage of children who received booster immunization (DPT-HB-Hib and Measles) was 75.95%, exceeding the 2020 Renstra target of 70% (Ministry of Health – Republic of Indonesia, 2020).

Several factors influence a mother's compliance with MR immunization, including knowledge about immunization, education, occupation, attitude, income, family support, and support from healthcare workers. Knowledge plays a crucial role in the decision to follow

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immunization recommendations, as a lack of understanding among mothers often leads to the perception that immunization is unnecessary. This knowledge encompasses various aspects of MR immunization, including its definition, purpose, benefits, administration method, contraindications, side effects, and schedule.

A preliminary study conducted at the Long Kali Health Center revealed that out of 10 mothers with children under 24 months, none brought their child for the MR booster immunization at 24 months. This was primarily due to a lack of awareness that such a booster was necessary for their child. This research aims to determine the relationship between maternal knowledge and adherence to Measles Rubella (MR) immunization in children under two years old.

2. Method

Research design

This study is a quantitative research project featuring a descriptive analysis of two observed variables. The population for this study consists of all mothers with children aged 24 to 36 months in the Long Kali Community Health Center, Paser, Indonesia.

Participant

The sample is a portion of the population that shares the characteristics of the entire population. The sampling method used is total sampling, where the entire population is sampled (Sugiyono, 2018). According to Arikunto (2018), if the population is less than 100, it is advisable to take the entire population as the sample. Therefore, the sample size in this study is 34 individuals.

Data collection

The knowledge instrument used by Nurstifani et al. (2019) consists of 24 questions using the Guttman scale. The instrument was tested on 20 respondents. Of the 24 questions, 3 were found invalid because their calculated r-value was less than the table r-value of 0.334, specifically question numbers 6 (0.285), 10 (0.312), and 11 (0.258). These questions were removed, leaving 21 valid questions.

Data Analysis

The study involves one independent variable and one dependent variable. The independent variable is the knowledge about Measles Rubella (MR) immunization, while the

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dependent variable is compliance with Measles Rubella (MR) immunization. The reliability test yielded a result of r = 0.963, which is greater than r = 0.600. The analysis used the Chi-square test because it compares observed frequencies with expected frequencies in categorical relationships.

Ethical consideration

The ethical approval for this study was granted under the number 102/KEP-UNISM/II/2024. The research adhered to ethical standards by ensuring that participation was voluntary and that respondents were fully informed about the study's objectives and expected benefits.

3. Results

Participant characteristics

The following table provides a comprehensive overview of the demographic characteristics of the study's participants (Table 1). It includes data on age distribution, educational attainment, employment status, and the number of children. The age distribution is predominantly within the 21-25 years range, which represents the largest group of

Table 1. Demographic characteristics of participant

Characteristics	Frequency (Participant)	Percentage (%)
Ages (year)		
15-20	8	23,53
21-25	23	67,65
26-30	3	8,82
Total	34	100
Education levels		
Elementary School	5	14,71
Junior High School	14	41,18
Senior High School	11	32,35
Tertiary Education	4	11,76
Total	34	100
Employment		
Housewife	28	82,35
Entepreneur	6	17,65
Total	34	100
Children		
1-2	14	41,18
3-4	17	50,00
5-6	3	8,82
Total	34	100

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participants. In terms of educational levels, most participants have completed Junior High School, with smaller proportions having finished elementary or senior high school, and even fewer have attained tertiary education. Employment data shows that a significant majority of the participants are housewives, with a minority engaged in entrepreneurial activities. The table also reflects the number of children per participant, highlighting that most have between 3 to 4 children.

Distribution of maternal knowledge and compliance categories

The following table provides insights into the maternal knowledge and compliance categories, as recorded from the study participants. The data is categorized based on the level of knowledge regarding maternal health and the degree of compliance with recommended practices. The table reveals that a significant portion of the participants demonstrated poor knowledge, with over half of them falling into this category. A smaller percentage of participants had sufficient or good knowledge. Regarding compliance, the data indicates that the majority of participants did not comply with the recommended practices, with less than a third adhering to them.

Table 2. Distribution of maternal knowledge and immunization complience

Dimension	Frequency (Participant)	Percentage (%)
Knowledge		
Good	7	20,6
Sufficient	8	23,5
Poor	19	55,9
Total	34	100
Immunization compliance		
Comply	10	29,4
Discomply	24	70,6
Total	34	100

Association of knowledge and compliance with Measles -Rubella immunization

The analysis presented in Table 3 demonstrates a significant association between maternal knowledge and compliance with Measles -Rubella immunization ($p = 0.001$). Among mothers with good knowledge, compliance was the highest, with 17.6% adhering to the immunization schedule, while only 2.94% failed to comply. In contrast, those with sufficient knowledge showed lower compliance (8.82%) but slightly higher non-compliance (14.70%). Mothers with poor knowledge exhibited the lowest compliance rate (2.94%) and the highest

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non-compliance rate (52.94%). This finding underscores the critical role of maternal knowledge in influencing health behaviors and adherence to immunization protocols.

Table 3. Association of knowledge and compliance with Measles -Rubella immunization

Knowledge	`Compliance				Total		p-value*
	Yes		No		N	%	
	n	%	n	%			
Good	6	17.6	1	2.94	7	20.59	0.001
Sufficient	3	8.82	5	14.70	8	23.53	
Poor	1	2.94	18	52.94	19	55.88	

Notes: n are respondents; * is Chi-square test.

4. Discussions

The present study evaluated the demographic characteristics, maternal knowledge, and immunization compliance of mothers, with a focus on the association between knowledge levels and compliance rates regarding Measles -Rubella immunization. The findings underscore the significant role of maternal education and knowledge in shaping healthcare behaviors and outcomes. The demographic analysis revealed that the majority of participants were in the 21–25 years age range, with most having completed junior high school and serving as housewives. These results align with prior research indicating that younger mothers with limited educational backgrounds often face challenges in accessing healthcare information and services (Jeanne N., 2024; Joyce et al., 2020; Krahe et al., 2023). Limited educational attainment is associated with lower health literacy, which can impede understanding of immunization benefits and guidelines (Heraclides et al., 2024: Xing et al., 2022).

In the knowledge assessment, more than half of the participants exhibited poor knowledge, a finding consistent with studies highlighting gaps in maternal understanding of immunization protocols in low-resource settings (Simas & Larson, 2021). This deficiency in knowledge directly correlates with suboptimal compliance, as evidenced by the high non-compliance rate (70.6%). Mothers with poor knowledge may harbor misconceptions about vaccine safety or necessity, as reported in similar studies (Brown et al., 2010).

Our study identified a significant association between maternal knowledge levels and immunization compliance. Mothers with good knowledge demonstrated higher compliance rates, corroborating evidence from global health research emphasizing the critical role of educational interventions in improving vaccination adherence (Ozawa et al., 2016). This correlation suggests that targeted health education programs could bridge the knowledge

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gap and enhance compliance rates, especially among less-educated mothers.

In vaccination efforts, the community generally demonstrates good coordination with healthcare providers, volunteers, and village officials (Dewi et al., 2024). However, cultural and socioeconomic factors also likely contribute to the observed trends. Housewives often lack the autonomy to make healthcare decisions independently, a barrier documented in various studies on maternal and child health (Ahmed et al., 2010). Moreover, the lack of exposure to reliable health information through mass media or community outreach could exacerbate these disparities (Sacre et al., 2022; Srivastava et al., 2022).

The significant p-value (0.001) from Chi-sqare test highlights the robust association between knowledge and compliance. Similar results have been reported in global studies, where maternal knowledge consistently emerges as a key determinant of immunization coverage (Herlina et al., 2024; Sulastri & Fadza, 2024). Improving maternal knowledge not only increases compliance but also fosters greater trust in healthcare systems, reducing vaccine hesitancy (Marin-Cos et al., 2022; Mbonigaba et al., 2024).

Interestingly, the compliance rate among mothers with sufficient knowledge was not substantially higher than those with poor knowledge. This may indicate that "sufficient" knowledge does not necessarily translate into actionable understanding or behavioral change. Knowledge alone is insufficient unless accompanied by motivational factors and supportive environments that encourage compliance (Christopher, 2024; Montuori et al., 2023).

The study also draws attention to broader systemic issues, such as healthcare accessibility and socioeconomic barriers. Mothers who lack autonomy in decision-making, as is often the case in patriarchal societies, may face additional challenges in ensuring their children receive vaccinations (McKenzie et al., 2024). Healthcare providers must therefore work collaboratively with communities to empower mothers and address structural barriers to compliance.

Limitations of the study include its small sample size (n = 34), which restricts the generalizability of the findings. Future research should involve larger cohorts and explore additional variables such as the role of paternal involvement, healthcare provider attitudes, and the influence of media on vaccine perceptions. Additionally, longitudinal studies could provide deeper insights into how maternal knowledge evolves over time and its long-term

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impact on child health outcomes.

5. Conclusion

This study underscores the critical link between maternal knowledge and compliance with Measles -Rubella immunization. Tailored educational interventions, combined with systemic efforts to reduce barriers, are essential to improving vaccination rates and safeguarding child health. Policymakers and healthcare providers must prioritize these strategies to achieve higher immunization coverage and reduce preventable diseases.

6. Conflict of interest

All authors declare no conflict of interest.

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