

Determinants of follow-up immunization participation among toddlers in the service area of north kuta community health center, Indonesia

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ABSTRACT

Background: Follow-up immunization participation among toddlers aged 18–24 months in Indonesia, including North Kuta, has improved but still struggles to meet national targets. Factors like parental education, employment, knowledge, and family support need evaluation to boost coverage

Objective: This study aimed to identify factors that influenced follow-up immunization participation among toddlers aged 18–24 months in the North Kuta Community Health Center service area.

Methods: An analytical observational study with a cross-sectional design was conducted among a population of 200 toddlers immunized between October and December 2023. A purposive sample of 133 toddlers was selected based on inclusion and exclusion criteria. Data were collected using validated questionnaires and checklists to assess parental knowledge and family support. Univariate and bivariate analyses were performed using the Spearman rank test.

Results: The majority of toddlers (56.4%) were aged 18–21 months, and 54.1% were female. Full vaccination was received by 86.5%, while 15% experienced delays, and 3.8% were unvaccinated. Most parents had university education (67.7%) or high school education (26.3%), and 62.4% had good knowledge of immunization. Family support was classified as strong (52.6%) or sufficient (41.4%). Significant correlations were identified between parental education ($p = 0.002$), knowledge ($p = 0.000$), family support ($p = 0.001$), and immunization participation, while parental occupation showed no significant relationship.

Conclusion: Parental education, knowledge of immunization, and family support significantly influence follow-up immunization participation. Targeted interventions to raise awareness, particularly among less-educated parents, and strategies to strengthen family involvement are recommended to improve immunization coverage.

Keywords: follow-up immunization; parent education; family support; immunization benefits; health disparities

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INTRODUCTION

Participation in advanced immunization for toddlers aged 18-24 months is essential for disease prevention and improving children's health (Barrow et al., 2023). Involving children in immunization programs is a vital preventive measure and a foundation for achieving public health goals (Mekonnen et al., 2020). Follow-up immunizations protect children from the risk of infectious diseases

and prevent long-term health complications (Angadi et al., 2013). Despite the recognized benefits, challenges such as parental awareness, socioeconomic factors, and accessibility to healthcare services still hinder optimal immunization coverage in many regions. Although previous studies (Marshall et al., 2013 & Garcia-Toledano et al., 2022) have highlighted the importance of parental education and family support in immunization

participation, limited research has specifically addressed how these factors operate in regional contexts with disparities, such as North Kuta.

The latest data from the Indonesian Ministry of Health shows that the achievement of DPT-HB-Hib and MR immunization in children under five in Indonesia reached 85.7% and 85.3%, while in Bali it reached 92.8% and 92.5% ([Ministry of Health of the Republic of Indonesia, 2023](#)). However, some areas such as the North Kuta Health Center are still showing achievements below the target. Monitoring and evaluation from January to October 2023 showed significant variations in the percentage of immunization in villages in the work area of the North Kuta Health Center. Tibubeneng Village recorded an increase from 21.4% in January to 93.0% in October, while several other villages experienced a decrease. These variations suggest disparities in healthcare access, community awareness, or resource allocation that require further investigation.

In-depth evaluation is needed to understand factors such as parental education, employment, knowledge about immunization, and family support in immunization participation ([Surbakti et al., 2022](#)) ([Asih & Putri, 2022](#)). Parental education, parental work, knowledge about immunization, and family support greatly influence their decision to immunize children. Higher education is generally positively correlated with parents' understanding of the benefits of immunization and awareness of the importance of preventive measures ([Surbakti et al., 2022](#)).

Family support is also an important factor in shaping an environment that supports immunization participation ([Hobani & Alhalal, 2022](#)). Families who provide support can be the main motivator, offering practical assistance such as accompanying parents and children to the health center. This research is expected to provide insight into how to increase family support to achieve optimal immunization goals and make an important contribution to the development of child health policies and intervention programs in the area of the North Kuta Health Center ([Damjanović et al., 2018](#)). This study differs from prior research by focusing on localized disparities within the North Kuta Health Center area, identifying specific determinants that influence follow-up immunization

participation. By addressing these factors, the study aimed to fill a critical gap in understanding how regional and community-level factors impacted immunization coverage in Indonesia.

METHOD

The design of this study uses an observational analytical approach with a cross-sectional design to collect data at a specific time without intervening with the observed variables. The study population was all children who came or received immunizations at the North Kuta Health Center during October-December 2023, totaling 200 people. The minimum sample was calculated using Cochran's formula, resulting in a minimum sample of 133 people with an accuracy rate of 5%. Sampling was carried out using purposive sampling based on inclusion criteria (parents of children aged 18-24 months who live in the work area of the Health Center) and exclusion criteria (children with certain health conditions, communication disabilities, or inability to participate).

This research was carried out in the work area of the North Kuta Health Center in April-May 2024, paying attention to aspects of research ethics such as social/clinical value, scientific value, equal distribution of burden and benefits, potential benefits and risks, as well as privacy and informed consent. Data is collected through checklists and questionnaires that have been validated and reliable. Data analysis was carried out using univariate methods for individual characteristics and single variables, as well as bivariate analysis using the Spearman rank test to evaluate the relationship between variables such as age, gender, immunization history, parental education and employment, parental knowledge, and family support for follow-up immunization participation in toddlers. This research has undergone an ethical feasibility review by the Ethics Committee of Stikes Bina Usada Bali and was declared ethically feasible with the number: 093/EA/KEPK-BUB-2024.

RESULTS

Demographic data or characteristics of respondents in the study are as follows:

Table 1. Characteristics of Respondents (Children Aged 18–24 Months) in the Working Area of North Kuta Health Center (n = 133)

Characteristic	Frequency (n)	Percentage (%)
Age (Months)		
18-21	75	56.4
22-24	58	43.6
Gender		
Male	61	45.9
Female	72	54.1

Characteristic	Frequency (n)	Percentage (%)
Immunization History		
Complete Vaccination	115	86.5
Delayed Vaccination	13	15.0
Not Vaccinated	5	3.8

Based on the data [table 1](#), 56.4% of respondents were aged 18–21 months, with an average age of 21 months. Regarding gender, 45.9% of respondents were male, and 54.1% were female. Immunization

history shows that 86.5% of respondents had complete vaccinations, 15.0% experienced delayed vaccinations, and 3.8% had not received any vaccinations.

Table 2. Factors Affecting Toddler Participation in Follow-Up Immunization in the Working Area of North Kuta Health Center (n = 133)

Independent Variable	Participation in advanced immunization of 					
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Information: *Significant

In [Table 2](#), The bivariate analysis identified several factors influencing follow-up immunization participation among toddlers. Parental education was significantly associated with immunization participation ($p = 0.002$), with the highest percentage among college-educated parents (48.9%). Parental occupation showed no significant association ($p = 0.123$). Parental knowledge ($p = 0.000$) and family support ($p = 0.001$) were also significantly related to immunization participation,

with good knowledge (66.9%) and strong family support (62.4%) being the most influential factors.

DISCUSSION

Research shows that the level of parental education has a significant effect on children's immunization participation. Parents with higher education are more likely to follow a complete immunization schedule compared to those with secondary or lower education. [Smith et al. \(2017\)](#)

found that parental education significantly impacts children's health decisions, including adherence to immunization programs. Similarly, [Mekonnen et al. \(2020\)](#) noted that educated parents tend to have better awareness of immunization benefits, which directly influences their decision-making regarding child vaccinations. This suggests that enhancing educational interventions targeting less-educated parents could improve immunization participation rates in communities. To address this disparity, targeted education campaigns focusing on less-educated parents are essential. Programs could include workshops, printed materials, and the use of community leaders to bridge the knowledge gap. Research [Parth et al., & Morris et al., \(2020\)](#) states that education focused on parents has an effect on increasing knowledge. And the use of religious figures is also very influential in increasing knowledge and attitudes in making decisions to carry out further immunization for children ([Oyo-Ita et al., 2021; Tiwana & Smith, 2024](#)).

Previous research has also supported the connection between parental education and adherence to immunization schedules. Parents with higher education levels are often more informed about the importance of timely immunizations and are more likely to comply with the recommended schedules ([Barrow et al., 2023](#)). Improving parental education through targeted health campaigns and community outreach programs could be a key strategy in increasing child immunization coverage. These programs could also bridge the gap between medical knowledge and practice, helping parents with lower education levels to understand the critical role of immunizations in preventing childhood diseases.

The study showed variations in the type of work of parents in the North Kuta Health Center area but found no significant relationship between parental occupation and the level of child immunization participation. [While Smith et al \(2017\)](#) identified several occupational factors such as working hours, schedule flexibility, and accessibility to health facilities that might affect a child's immunization, this study did not reveal any significant correlation. Future research could explore how job-related stress and access to healthcare services influence immunization behaviors, particularly for parents in informal or shift-based employment. However, understanding the nuances of parental employment remains crucial for designing effective immunization strategies, as some parents may face work-related barriers. Future studies should explore how occupational factors, particularly for parents in informal or shift-based jobs, impact their ability to access immunization services.

Although this study did not find a significant correlation between occupation and immunization,

ensuring that parents with demanding work schedules have access to convenient immunization services is essential. Providing flexible immunization hours or mobile vaccination units could alleviate challenges faced by working parents. Furthermore, collaboration between healthcare providers and employers, especially in rural or underserved areas, could help create an environment conducive to timely immunization. [Mekonnen et al. \(2020\)](#) suggest that job-related stress and psychological well-being can also affect parental involvement in child health activities, highlighting the need for supportive workplace policies.

Parental knowledge about immunization plays a critical role in children's immunization participation. This study found that most parents had good knowledge of immunizations, which correlated with higher participation rates. [Dubé et al. \(2013\)](#) emphasized that parents who understand the benefits of immunization, the risks of vaccine-preventable diseases, and the vaccination schedule are more likely to ensure their children complete the immunization series. Knowledge gaps, however, still exist, particularly in lower-income or rural areas. Addressing these gaps through accessible education programs and public health campaigns could significantly boost immunization rates. To address existing gaps, public health campaigns must use accessible media, such as mobile applications and public health workers including nurses, to disseminate accurate information. In line with research [Sharma & Kaur, \(2017\)](#) which states the use of technology in disseminating information effectively.

Increasing parental understanding of immunization benefits through comprehensive education programs is crucial. These programs should provide parents with accurate and easily digestible information about vaccine-preventable diseases and the importance of timely immunization. Leveraging information technology, such as mobile health apps and social media, can also be an effective way to disseminate information and remind parents about vaccination schedules. Future research should examine how different methods of delivering immunization information, including through digital platforms, can influence parental decision-making and improve participation rates.

Family support also plays a significant role in children's immunization participation. This study found that the majority of families provided strong support, which was associated with higher levels of child immunization participation. Family support includes logistical help, such as managing immunization appointments, and emotional encouragement for parents who may be hesitant about vaccinations. Strengthening family support could involve engaging extended family members

through community education programs and collaborations between health centers and local organizations (Ishimaru, 2019). Studies by Turner et al. (2022) have shown that strong family involvement correlates with more consistent participation in preventive health measures, including child immunization.

To strengthen family support for immunizations, targeted interventions that engage all family members could be beneficial. Educational programs that involve both parents and extended family members could foster a shared understanding of the importance of immunizations. Collaboration between the health and education sectors could further enhance this support, as schools and community centers can serve as platforms for delivering immunization education. Further research is needed to explore the specific factors within families that influence immunization decisions and how tailored interventions can improve family support for immunizations.

Implications

This study underscores the importance of parental education, knowledge, and family support in improving immunization participation. Targeted health campaigns and family-centered programs are crucial to addressing gaps in awareness and fostering collective engagement. Additionally, flexible immunization services, such as mobile units and extended clinic hours, can accommodate diverse parental schedules. These findings provide actionable insights for localized strategies to enhance immunization coverage.

Limitations and Recommendations

The study's cross-sectional design limits causal interpretations, and its focus on a single area may affect generalizability. Self-reported data also introduces potential bias. Future research should explore causal relationships, include diverse populations, and use qualitative methods to deepen understanding of parental decision-making. Addressing these limitations will strengthen efforts to improve immunization strategies.

CONCLUSIONS

This study concludes that there is a significant correlation between parental education, parental knowledge, and family support with the participation of children in follow-up immunizations in the working area of the North Kuta Health Center. However, parental occupation did not show a significant effect on immunization participation. The findings highlight the importance of enhancing education and knowledge about immunization among parents, as well as strengthening family support to improve child immunization coverage.

Declaration of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper. The authors have no financial or other interests in the products or distributors mentioned in this study. There are no associations, such as consultancies, stock ownership, or other equity interests or patent licensing arrangements, to disclose.

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Authors' Contributions

All authors contributed substantially to the conceptualization, design, data curation, formal analysis, interpretation, writing, review, and editing of the paper. All authors approve the final version to be published.

Data Availability

The datasets generated during and analyzed during the current study are available from the corresponding author upon reasonable request.

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