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*Original Research*

# Posyandu cadres roles and complete basic immunization coverage in Muara Teweh Community Health Center

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**ABSTRACT**

*Background*: Complete basic immunization remains a critical public health intervention to reduce infant morbidity and mortality. In Indonesia, immunization coverage remains below the national target, especially in remote regions such as Muara Teweh, Central Kalimantan. Posyandu cadres—community health volunteers—are essential actors in promoting immunization at the grassroots level. However, the effectiveness of their roles has not been consistently evaluated.

*Objective*: This study aimed to assess the association between the roles of Posyandu cadres—both during Posyandu sessions and outside regular activities—and the achievement of complete basic immunization coverage in Muara Teweh Comuunity Health Center.

*Method:* A quantitative cross-sectional study was conducted involving 32 Posyandu cadres in Kelurahan Pangkuh Raya. Total sampling was applied. Data were collected using a structured, validated questionnaire assessing cadre roles and immunization status, verified through Posyandu and Mother and Child Health records. Data analysis involved Chi-Square and Fisher's Exact tests, with significance set at $p < 0.05$.

*Result*: The findings revealed that 68.7% of infants had complete basic immunization. Most cadres (78.1%) were highly involved during Posyandu, and 87.5% were active outside it. However, statistical analysis showed no significant relationship between cadre roles during ($p = 1.000$) or outside ($p = 0.465$) Posyandu and immunization coverage.

*Conclusion*: While cadre involvement was generally high, it did not significantly impact immunization outcomes. Future interventions should focus on improving cadre communication skills, addressing contextual barriers, and integrating supportive systems to enhance immunization effectiveness in remote settings.

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## 1. Introduction

Complete basic immunization is one of the most effective and cost-efficient public health interventions in preventing potentially fatal infectious diseases in infants and children. Vaccines such as BCG, DPT-HB-HiB, polio, hepatitis B, measles, rotavirus, and IPV are administered within the age range of 0–11 months to ensure optimal immune protection from an early age. Through comprehensive coverage of complete basic immunization, the incidence of illness, disability, and child mortality can be significantly reduced. Immunization not only offers individual protection but also creates herd immunity, which is essential to interrupt the chain of disease transmission (Anil Batta, 2020; Shrivastava et al., 2014). Moreover, immunization serves as a critical indicator of health development, reflecting accessibility, quality of basic health services, and public awareness. However, several factors such as geographical barriers, lack of information, social stigma, and limitations in primary healthcare personnel often impede the achievement of immunization coverage (Abubakar, 2024; E et al., 2025; Essa-Hadad et al., 2024; Richard, 2024). Therefore, strengthening complete basic immunization coverage requires cross-sectoral attention at both national and regional levels, particularly within primary care services at the village and sub-district levels, which serve as the frontline of the government's immunization program.

The World Health Organization (WHO) has reported that the COVID-19 pandemic significantly disrupted routine immunization programs across many countries (Athiyaman et al., 2023; Cardoso Pinto et al., 2023). In 2021, over 25 million children globally did not receive complete basic immunization, including many children in Indonesia (WHO, 2022). In Indonesia, national immunization coverage also declined from 93.7% in 2019 to 84.5% in 2021. The 2019–2024 National Medium-Term Development Plan set ambitious targets: 90% of children aged 12–23 months and 80% of infants aged 0–11 months in 488 districts/cities should receive complete basic immunization by 2024 (Ministry of Health - Republic of Indonesia, 2022). However, significant challenges remain, particularly in remote regions such as Central Kalimantan, which recorded a complete basic immunization coverage rate of only 78.5%, with Universal Child Immunization (UCI) at 61.6% (Health Agency of Central Kalimantan, 2020). Several districts/municipalities reported fluctuating immunization rates, including North Barito Regency, where many health centers have yet to meet national targets. At Muara Teweh Health Center, 2024 data indicated that only 165 of 528 infants aged 0–11

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months (31.25%) received complete basic immunization. This figure is significantly below the national target and highlights systemic, human resource, and sociocultural barriers that continue to hinder the program's implementation.

Indonesia's primary healthcare system promotes the role of community health workers, particularly Posyandu cadres—volunteers who operate in community-based health posts that aim to improve maternal and child health. Posyandu cadres are community volunteers who play a vital role in implementing and sustaining Posyandu activities. In the context of immunization, cadres are responsible for identifying target beneficiaries, conducting health education, promoting awareness, and reminding parents of immunization schedules (Rahmayanti et al., 2022; Soumokil et al., 2023; Widarti et al., 2019). In many regions, the success of immunization programs largely depends on how active and effective cadres are in fulfilling their responsibilities, both during and outside Posyandu activities. Previous studies have shown that well-trained and highly motivated cadres can enhance parental awareness and increase participation in immunization programs. However, not all cadres demonstrate the same level of competence or commitment. These variations can significantly impact immunization outcomes in a given area. Therefore, capacity building and regular performance evaluation of cadres should be prioritized in strengthening the national immunization program (Herlianty et al., 2023; Siagian & Hasibuan, 2024; Soumokil et al., 2023). Strengthening the role of cadres not only as information providers but also as agents of behavioral change is essential to increase voluntary demand for immunization in the community.

Despite the growing number of studies highlighting the importance of immunization and the role of cadres in expanding immunization coverage, there remains a gap in understanding how the variation in cadre roles—both during Posyandu and outside of it—correlates significantly with the achievement of complete basic immunization, particularly in remote areas like Central Kalimantan. Many national and regional studies tend to focus on maternal knowledge, access to services, or government interventions, but rarely differentiate the influence of cadre involvement across temporal and spatial contexts. In the Muara Teweh Health Center service area, immunization coverage that remains far below the national target suggests the presence of unaddressed local challenges. One hypothesis is that the roles of cadres have not been maximized or systematically structured. Therefore, this study aims to fill the existing gap in the literature by exploring the relationship between the two dimensions

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of cadre roles (during and outside Posyandu) and the success of complete basic immunization. This research is essential to develop more focused, sustainable, and context-appropriate community-based intervention strategies, with the ultimate goal of improving child health outcomes in the region.

This study aims to examine the relationship between the role of Posyandu cadres—both during official Posyandu sessions and outside regular Posyandu activities—and the achievement of complete basic immunization in the Muara Teweh Health Center working area. Through this approach, the study seeks to determine whether cadre activities across these two temporal domains significantly influence parental decisions to complete their children's immunization schedules. This objective is critical, given that cadres are the closest health service representatives to the community, and the success of immunization programs is strongly influenced by the quality of communication and trust built between cadres and community members. Understanding the extent to which cadre roles impact immunization coverage is expected to yield practical recommendations to enhance cadre effectiveness in supporting basic immunization efforts. Additionally, the findings of this study may serve as a valuable reference for health center administrators and health departments in designing cadre training, performance evaluations, and supervision systems that are more responsive to local challenges in the Muara Teweh.

## 2. Method

### Research Design

This study employed a quantitative design with a cross-sectional approach, an observational method intended to examine the relationship between independent and dependent variables at a single point in time. This design was selected as it is suitable for simultaneously describing the relationship between the role of community health cadres—both during Posyandu activities and outside of them—and the achievement of complete basic immunization. The approach is effective in illustrating social health phenomena both descriptively and analytically and provides a foundation for analyzing associations between observed variables. By focusing on a specific population at a defined time, this design also enables the identification of local contextual factors relevant to the role of cadres within the working area of Muara Teweh Health Center.

### Respondent

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The study population consisted of all active Posyandu cadres for toddlers in Kelurahan Pangkuh Raya, under the working area of Muara Teweh Health Center, North Barito Regency, Central Kalimantan Province. The sampling technique used was total sampling, considering the relatively small number of active cadres, which allowed the entire population to be included. A total of 32 Posyandu cadres participated in this study. Inclusion criteria included cadres who had been active for at least the past six months, were willing to participate, and could comprehend the contents of the questionnaire. Exclusion criteria included cadres who were on leave or could not be contacted during the data collection period. Participation was voluntary and anonymous to maintain objectivity and uphold research ethics.

**Data Collection**

Data were collected using a structured, close-ended questionnaire that had been validated by experts and pre-tested for reliability. The instrument consisted of three main sections: (1) demographic data of the cadres, (2) assessment of the cadre's role during Posyandu activities, and (3) assessment of the cadre's role outside of Posyandu. Meanwhile, data on the status of complete basic immunization were obtained from the Mother and Child Health handbook and Posyandu records, verified by the cadres. Data collection was conducted between January 17 and February 24, 2024. Questionnaires were administered directly at the cadre activity locations under the guidance of the researcher. To ensure data accuracy, primary data were cross-checked with secondary data from Posyandu records in Kelurahan Pangkuh Raya.

**Data Analysis**

Data were analyzed using SPSS software version 26. Univariate analysis was conducted to describe the characteristics of respondents and the frequency distribution of research variables. Subsequently, bivariate analysis was performed to assess the relationship between the role of cadres (during and outside Posyandu) and the achievement of complete basic immunization using the Chi-Square test or Fisher's Exact Test where Chi-Square assumptions were not met. The level of statistical significance was set at $p < 0.05$.

**Ethical Consideration**

This research obtained written approval from the Muara Teweh Community Health Center as the authorized institution overseeing the study location. In addition, all respondents were given a prior explanation of the purpose and objectives of the study, the data collection

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procedure, and their right to withdraw participation at any time without consequences. An informed consent form was provided and signed voluntarily by each respondent after they had fully understood the content and implications of the study. This study upheld the ethical principles of anonymity, data confidentiality, and non-maleficence, ensuring no physical or psychological harm to participants. All collected data were used solely for scientific purposes and were kept confidential in accordance with health research ethics standards.

## 3. Result

Table 1 presents the frequency distribution of three primary variables examined in this study: the status of complete basic immunization, the role of cadres during Posyandu (integrated health service posts), and the role of cadres outside of Posyandu activities. Based on data obtained from 32 Posyandu cadre respondents in the working area of the Muara Teweh Community Health Center, it was found that 22 infants (68.7%) had received complete basic immunization, while 10 infants (31.3%) had not. Although the majority of children received the full immunization schedule, the coverage remains below the national target of 80%.

Regarding the role of cadres during Posyandu activities, 25 respondents (78.1%) were categorized as having a good level of involvement, while 7 respondents (21.9%) were considered to have fair involvement. This suggests that most cadres actively participated in essential Posyandu tasks such as registration, weighing, record-keeping, and providing health education. Meanwhile, in terms of cadre engagement outside Posyandu sessions, 28 respondents (87.5%) were found to be actively involved in activities such as community outreach, immunization scheduling, and household health promotion, with only 4 respondents (12.5%) showing limited involvement. These findings indicate a generally strong cadre presence both within and beyond Posyandu settings. Detailed data are presented in Table 1.

Table 1. Frequency distribution of complete basic immunization, role of cadres during posyandu, and role of cadres outside posyandu

| Variables | | Frekuency (n) | Percentage (%) |
|---|---|---|---|
| Complete basic immunization | Successful | 22 | 68,7 % |
| | Unsuccessful | 10 | 31,3 % |
| | Total | 32 | 100% |
| Role of cadres during Posyandu | Good | 25 | 78,1 % |
| | Faid | 7 | 21,9 % |
| | Total | 32 | 100% |

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| | | | |
|---|---|---|---|
| Role of cadres outside Posyandu | Present | 28 | 87,5 % |
| | Not present | 4 | 12,5 % |
| | Total | 32 | 100% |

Table 2 displays the cross-tabulation results of the relationship between the role of health cadres—both during and outside of Posyandu activities—and the achievement of complete basic immunization among infants. The table presents frequencies, percentages, and p-values to determine the statistical significance of these associations. Regard to the role of cadres during Posyandu, of the 25 cadres categorized as having a good role, 13 (40.6%) supported successful immunization, while 12 (37.5%) were associated with unsuccessful outcomes. Among the 7 cadres with a fair role, 3 (9.4%) were linked to successful immunization, whereas 4 (12.5%) were not. Despite the slightly higher number of successful outcomes among cadres with a good role, the statistical test using Fisher's Exact yielded a p-value of 1.000, indicating no significant association between cadre performance during Posyandu and immunization outcomes.

Similarly, in terms of the role of cadres outside Posyandu activities, 11 of the 28 active cadres (34.4%) contributed to successful immunization, while 9 (28.1%) did not. Among the 4 cadres categorized as absent, 5 (15.6%) were associated with success, and 7 (21.9%) with failure. The chi-square test produced a p-value of 0.465, which also denotes no statistically significant relationship. These findings, as summarized in Table 2, suggest that the cadres' involvement, whether during or outside of Posyandu, was not significantly associated with immunization completeness in this sample.

Table 2. Role of cadres and successful of complete basic immunization relationship

| Role of cadres | Complete basic immunization | | | | | | P value |
|---|---|---|---|---|---|---|---|
| | Successful | | Unsuccessful | | Total | | |
| | F | % | F | % | F | % | |
| During Posyandu | | | | | | | |
| Good | 13 | 40,6 | 12 | 37,5 | 25 | 78,1 | 1.000[a] |
| Fair | 3 | 9,4 | 4 | 12,5 | 7 | 21,9 | |
| Total | 16 | 50 | 16 | 50 | 32 | 100 | |
| Ourside Posyandu | | | | | | | |
| Present | 11 | 34,4 | 9 | 28,1 | 20 | 62,5 | 0.465[b] |
| Absent | 5 | 15,6 | 7 | 21,9 | 12 | 37,5 | |
| Total | 16 | 50 | 16 | 50 | 32 | 100 | |

Notes: F is frequency of respondent; [a] is Fisher exact test; [b] is Chi square test

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## 4. Discussion

The findings of this study indicate that although most Posyandu cadres in the working area of Muara Teweh Health Center demonstrated a good level of engagement—both during formal Posyandu sessions and in activities beyond those settings—this involvement did not show a statistically significant relationship with the success of complete basic immunization coverage among infants. This is evident from the p-values obtained from the Fisher's Exact Test and Chi-Square Test, which were 1.000 and 0.465, respectively. These results seem to contradict previous studies emphasizing the critical role of active cadres in increasing immunization coverage (Mufida et al., 2024; Soumokil et al., 2023). However, a deeper analysis reveals that the role of cadres may not have a linear effect on immunization outcomes. In the context of Muara Teweh, several contextual factors—such as maternal education level, beliefs about immunization, and access to healthcare facilities—may simultaneously influence parental decisions to complete their children's immunization schedules, thereby diminishing the direct impact of cadre involvement. These influencing factors have been discussed in several studies (Amir et al., 2018; Dewanti et al., 2022; Erynda et al., 2020; Muti et al., 2020). Therefore, although cadres are actively involved, their impact may not be optimal due to a lack of systemic and holistic support or inadequate facilitation in delivering health messages effectively.

Although cadre participation during Posyandu activities was relatively high, the effectiveness of their role in motivating parents to complete their children's immunizations remains questionable. In this study, most cadres were rated as having a "good" role, but this assessment primarily reflected their involvement in administrative tasks such as registration, weighing, and record-keeping. It did not necessarily include their effectiveness in health promotion or their ability to communicate persuasively. This suggests the need to redefine cadre role indicators to measure not just quantitative involvement but also the quality of their contributions to behavior change. Cadres with higher knowledge levels are more effective in promoting immunization, as evidenced by a strong correlation ($r = 0.642$) between knowledge and their role in immunization services (Renaldi et al., 2024). Therefore, cadre training should not focus solely on technical aspects but also on strengthening interpersonal communication, motivation, and advocacy skills. This way, cadres' roles will be more meaningful in influencing families' decisions to complete and adhere to immunization schedules.

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Cadre involvement beyond Posyandu sessions—such as home visits or immunization reminders—also did not show a meaningful relationship with the success of complete basic immunization. This suggests that while cadres are present in the community, their presence alone may not be strong enough to overcome structural and sociocultural barriers that families face in accessing immunization services. In areas like Muara Teweh, with geographic challenges and limited transportation, cadre roles must be more proactive and strategic. Cadres should serve as communication bridges that link families to health services, not merely as passive reminders. The insignificant impact of cadre involvement may also reflect health message fatigue or declining community trust due to inconsistent cadre roles or workload burdens. Therefore, future intervention strategies should combine community-based approaches with technological support and intensive supervision from health centers to ensure cadre roles can be optimized effectively in real-life contexts.

It is important to highlight external factors that may mediate the relationship between cadre roles and immunization coverage. Previous studies have indicated that family decisions regarding immunization are influenced by economic status, parental education, perceived disease risk, and religious or cultural beliefs (Hindi Albalawi & Rezq, 2024; Kowalzik & Zepp, 2019; Ofei-Dodoo et al., 2023; Ulfah et al., 2025). These factors were not explicitly measured in this study, suggesting the presence of uncontrolled confounding variables. Moreover, the COVID-19 pandemic may have affected public perceptions of healthcare services and contributed to apprehension about visiting health facilities. This reflects the need for cadre-based interventions to be designed with greater contextual and evidence-based sensitivity. A combination of socio-cultural approaches, ongoing education, and stronger primary care referral systems would be more effective than relying solely on cadre involvement. This further reinforces that strategies to improve immunization coverage require multisectoral and interdisciplinary efforts, where cadres are just one of many components that must be empowered systemically.

This study has several limitations that should be acknowledged. First, the relatively small sample size (32 respondents) may limit the statistical power to detect significant associations, especially in a highly variable population. Second, the cross-sectional design captures relationships at a single point in time, making it difficult to assess causal relationships or changes in cadre roles over time. Third, the measurement instrument used to assess cadre

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roles was based on respondents' subjective assessments and may not fully reflect the quality of their interventions. Furthermore, this study did not measure external factors such as geographic access, maternal perceptions, or communication quality, which could have influenced the results. Although data were verified using mother and child health records and Posyandu data, the potential for information bias cannot be completely ruled out. Therefore, these findings should be interpreted with caution and not generalized beyond the local context without considering regional differences.

Based on these findings, future research is strongly recommended to explore mediating and moderating factors that influence the relationship between cadre roles and immunization success. Longitudinal studies would help assess the impact of cadre roles over time, thereby clarifying causality. Additionally, mixed-methods approaches combining quantitative and qualitative data could be valuable in exploring community perceptions, social dynamics, and the challenges cadres face in performing their duties. Local governments and health center administrators should also consider cadre training interventions that emphasize not only technical skills but also communication, cultural competence, and conflict resolution. Furthermore, integrating digital tools such as reminder apps, online reporting systems, and immunization tracking platforms could support cadres' work more efficiently. Moving forward, comprehensive and sustainable intervention strategies are expected to enhance cadre effectiveness and significantly improve complete basic immunization coverage in regions facing similar challenges.

## 5. Conclusion

This study concludes that there is no statistically significant relationship between the roles of Posyandu cadres—either during formal Posyandu sessions or outside of them—and the success of complete basic immunization coverage in the working area of Muara Teweh Health Center. Although most cadres exhibited a good level of engagement, their involvement alone was insufficient to guarantee complete immunization coverage among infants. These findings highlight the need to evaluate the effectiveness and quality of cadre roles and consider other contextual factors that influence families' decisions to complete their children's immunization schedules. Moving forward, cadre training programs should focus more on strengthening communication skills, advocacy, and cultural understanding. Additionally, reinforcing support systems from healthcare facilities and integrating

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community-based approaches will be crucial to the success of national immunization programs, particularly in regions with geographic and social challenges.

**5. Conflict of interest**

All authors declare no conflict of interest.

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