



The Effect of the Smart Dasawisma Cadre Movement on Complete Basic Immunization Coverage among Infants: A Quasi-Experimental Study in Bangkalan

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Abstract

Early marriage re Immunization is one of the most effective strategies for preventing disease transmission and reducing morbidity and mortality among infants and young children World Health Organization (WHO) data indicate that in 2023, global immunization coverage experienced stagnation, with several identified setbacks. This study aimed to analyze differences in immunization coverage before and after the implementation of the Smart Dasawisma kader Movement innovation. This innovation employed a quasi-experimental design using a one-group trial with a pre-test and post-test approach. The independent variable in this study was the smart dasawisma kader movement, while the dependent variable was the improvement in immunization complia. The study population consisted of 54 infants aged 9–12 months at the Kokop Community Health Center, selected using simple random sampling. The inclusion criterion was kader who were able to read and write. The Wilcoxon test results showed an Asymp. Sig. (2-tailed) value of 0.000 ($p < 0.05$), indicating a statistically significant difference before and after the intervention These findings indicate a statistically significant difference in respondents' immunization status before and after the intervention. Kader empowerment through structured mentoring is expected to be an effective strategy for improving immunization coverage.

Keywords: cadre, dasawisma, immunization

INTRODUCTION

Immunization is one of the most effective strategies for preventing disease transmission and reducing morbidity and mortality among infants and young children (Mardianti & Farida, 2020). Immunization is a health service aimed at protecting individuals from vaccine-preventable diseases (PD3I) and constitutes a fundamental component of primary health care, playing a critical role in lowering under-five mortality rates. Immunization has been proven to effectively prevent and reduce morbidity, disability, and mortality caused by PD3I. These diseases include tuberculosis (TB), polio, diphtheria, tetanus, hepatitis B, pertussis, measles, rubella, pneumonia, and meningitis. In Indonesia, every infant under 12 months of age is required to receive complete basic immunization, which consists of one dose of hepatitis B, one dose of Bacillus Calmette–Guérin (BCG), doses of diphtheria–pertussis–tetanus–hepatitis B–Haemophilus influenzae type B (DPT-HB HiB), doses of oral poliovirus vaccine (OPV), and one dose of measles or measles–rubella (MR) vaccine. The coverage of complete basic immunization in Indonesia in 2018 reached 90.61%, which remained slightly below the 2018 Strategic Plan target of 92.5% (Felicia & Suarca, 2020).

According to data from the World Health Organization (WHO), global immunization coverage in 2023 experienced stagnation, with several setbacks compared to pre–COVID-19 pandemic levels in 2019. For example, coverage of the third dose of the DPT vaccine (diphtheria, pertussis, and tetanus), an indicator of immunization program performance, remained at 84% in 2023. However, 14.5 million children worldwide did not receive a single dose of this vaccine, an increase from 13.9 million in 2022. This situation leaves many children vulnerable to preventable diseases, particularly in regions affected by complex challenges in accessing health services. Measles vaccine coverage also remained below optimal levels, with only 83% of children worldwide receiving the first dose and 74% receiving the second dose in 2023, far below the 95% coverage required to prevent outbreaks (Setiawan et al., 2025).

Based on data from the East Java Provincial Data and Information Center in 2023, immunization coverage reached 94% with an achievement rate of 106.38%, while Bangkalan Regency recorded coverage of 63.29%. The achievement of complete basic immunization in East Java Province has declined and has not yet reached the 100% target, and Bangkalan Regency reported coverage of 79.45%. These figures remain substantially below the national target of 100%. Tarmizi, as cited in (Pasambo et al., 2023) emphasized that according to the Indonesian Minister of Health, immunization programs must become inclusive movements with shared ownership among all Indonesian mothers. Education and persuasion efforts are needed so that mothers recognize the importance of immunization and feel responsible for ensuring their children are immunized (Pasambo et al., 2023).

According to Suparyanto (2019), several factors are associated with the completeness of basic immunization, including knowledge, occupation, experience, motivation, family support, availability of posyandu facilities, environment, attitudes, health workers, income, and education (Soumokil et al., 2024). If any of these factors are not adequately addressed, complete immunization coverage among children may not be achieved, potentially increasing child mortality. Children are also at high risk of contracting various vaccine-preventable diseases, such as measles, DPT, polio, BCG, and hepatitis. Failure to administer complete basic immunization routinely may not only slow child growth but also result in neurological impairment (Soumokil et al., 2024).

Community participation, as a strategic component expected to support accelerated immunization programs, is essential. Community involvement may include the provision of health data and information, as well as participation in policy considerations through existing community organizations. One manifestation of community participation in health programs is the establishment of community health volunteers. These volunteers collaborate with primary health centers to conduct posyandu activities, providing maternal and child health services, including health promotion related to immunization (Pasambo et al., 2023).

Research conducted by Rizki Septianingtyas et al. demonstrated that volunteer support influences the achievement of complete basic immunization. Therefore, it is recommended that volunteers enhance public education on complete basic immunization to increase coverage (Septianingtyas & Soesetijo, 2018). The smart dasawisma volunteer movement represents an innovative approach to improving immunization coverage, in which one volunteer is responsible for 10–20 households with infants. These volunteers are considered strategic components in supporting accelerated immunization programs. One effort that can be undertaken is revitalizing and strengthening the role of dasawisma volunteers as the frontline of community health services (Dewi, 2021). The aim of this study is to analyze the influence of the smart dasawisma cadre movement on the coverage of complete basic immunization in infants.

METHODOLOGY

Type of Research

This innovation employed a quasi-experimental design using a one-group trial with a pre-test and post-test approach. The independent variable in this study was the smart dasawisma kader movement, while the dependent variable was the improvement in immunization compliance.

Time and Location

This innovation was implemented in the service area of Kokop Primary Health Center, Bangkalan Regency. Primary data were obtained through questionnaires completed by dasawisma kader. Data collection was conducted using home visits conducted by kader from July to September 2025.

Sampling Technique, Sample Size, and Inclusion Criteria

A simple random sampling technique was applied to select 54 infants aged 9–12 months in the service area of Kokop Primary Health Center, Bangkalan Regency, who met the inclusion criteria. The sampling procedure involved screening respondents based on the inclusion criteria, followed by direct data collection in the Kokop Primary Health Center service area. The inclusion criteria were healthy infants whose caregivers agreed to participate and signed an informed consent form after receiving a complete explanation.

Dasawisma kader are community health volunteers assigned to accompany, remind, and conduct home visits for infants aged 9–12 months to ensure adherence to immunization schedules. A total of five dasawisma kader were involved, each accompanying a maximum of ten infants aged 9–12 months in the service area of Kokop Primary Health Center, Bangkalan Regency. Complete basic immunization refers to immunization administered to infants aged 0–11 months, with the final vaccine being measles or measles–rubella (MR) given at nine months of age. An infant is considered to have received complete basic immunization if all required vaccines are administered according to schedule before the age of 12 months. The selected kader were required to have basic literacy skills, including the ability to read and write. The stages of implementing this innovation project included: (1) selection of kader, (2) kader capacity strengthening, (3) allocation of research subjects, (4) implementation of mentoring by smart dasawisma kader during immunization activities, and (5) evaluation of immunization completeness outcomes.

Data analysis

Data analysis was conducted using the Wilcoxon signed-rank test.

Ethical Consideration

Ethical approval for this study was obtained from the Health Research Ethics Committee of Noor Huda Mustofa University under ethical clearance number 2786/KEPK/UNIV-NHM/EC/VII/2025, and all respondents signed an informed consent form after receiving a full explanation prior to data collection.

FINDINGS AND DISCUSSION

General Data

Table 1. Frequency Distribution of Infant Sex

NO	CATEGORY	N	%
1	Male	25	46
2	Female	29	54
	Total	54	100.0

Table 1 shows that more than half of infants aged 9–12 months in the service area of Kokop Primary Health Center, Bangkalan Regency, were female (55.9%), while nearly half were male (46%).

Table 2. Frequency Distribution of Kader Age

NO	CATEGORY	N	%
1	Late adolescence	1	17
2	Early adulthood	3	50
3	Late adulthood	2	33
	Total	6	100

Table 2 shows that half of the kader in the service area of Kokop Primary Health Center, Bangkalan Regency were in early adulthood (50%), while smaller proportions were in late adulthood (33%) and late adolescence (17%).

Table 3. Frequency Distribution of Kader Education

NO	CATEGORY	N	%
1	Primary	2	33
2	Secondary	3	50
3	Higher	1	17
	Total	6	100

Table 3 shows that half of the kader in the service area of Kokop Primary Health Center, Bangkalan Regency had a secondary level of education (50%), while smaller proportions had primary (33%) and higher education (17%).

Specific Data

Table 4. Achievement of Complete Basic Immunization Before and After the Intervention

Immunization Status	Before		After	
	N	%	N	%
Incomplete	32	60.4	9	17.0
Complete	21	39.6	44	83.0
Total	54	100	54	100
<i>wilcoxon test</i>		<i>Asymp. Sig. (2-tailed) = 0,000</i>		

Table 4 indicates a statistically significant improvement in immunization completeness following the intervention. Prior to the intervention, the majority of respondents were classified as having incomplete immunization, totaling 32 respondents (60.4%), while only 21 respondents (39.6%) had complete immunization. After the intervention, a meaningful change was observed, with the number of respondents who achieved complete immunization increasing to 44 (83.0%), while those with incomplete immunization decreased to 9 (17.0%). The Wilcoxon test results showed an Asymp. Sig. (2-tailed) value of 0.000 ($p < 0.05$), indicating a statistically significant difference before and after the intervention. These findings indicate a statistically significant difference in respondents' immunization status before and after the intervention. The results suggest that the intervention was effective in improving immunization completeness. It can therefore be concluded that there was a statistically significant difference in the achievement of complete basic immunization before and after the empowerment of dasawisma kader.

The role of kader in achieving complete basic immunization (CBI) coverage is a highly important factor, as kader serve as key mobilizers and primary communicators at the community level. Kader are responsible for providing persuasive education, motivating mothers of young children, collecting and recording target data, conducting home visits for children who do not attend immunization sessions, monitoring immunization status, and responding to community concerns in order to support the achievement of CBI coverage and protect children from vaccine-preventable diseases. As frontline actors with close ties to the community, kader function as a bridge between health workers and families of young children, enabling health information to be delivered and understood more effectively. Increased knowledge and active engagement of kader are significantly associated with higher coverage of complete basic immunization.

The results of this innovation project are consistent with the findings of (Siregar & Lubis, 2021) regarding factors associated with the achievement of Universal Child Immunization (UCI) status at the village level in the service area of Binjai Estate Primary Health Center in 2019. The statistical test showed a P-value of 0.001 (< 0.1) for the relationship between kader roles and village UCI achievement, indicating an association between kader involvement and UCI coverage. These findings are also aligned with the study by Haryati (2019), which reported a significant relationship between kader roles and the completeness of basic immunization among infants at Montasik Primary Health Center, Aceh Besar Regency, in 2019, with a P-value of 0.001 (Siregar & Lubis, 2021).

Kader play a crucial role in the implementation of posyandu programs. When kader are inactive, posyandu activities become less effective, resulting in unclear detection of children's nutritional status. Kader also have an important role in supporting child growth and development and maternal health, as communities often receive health information first through kader. Kader are individuals entrusted with implementing

programs organized by posyandu, and they generally possess greater health-related knowledge than other community members (Susanti, 2011).

Kader support the success of immunization programs through several activities: (1) assisting in the registration of immunization program targets (infants, toddlers, and elementary school-aged children); (2) mobilizing parents and targets to attend immunization services; (3) helping prepare immunization service locations and waiting areas before and after injections at posyandu or immunization service posts; (4) managing the flow of immunization services; (5) assisting with recording immunized targets; (6) identifying infants or children who have not received immunization and visiting their parents or families; (7) visiting families who have never brought their children to immunization service sites; and (8) reporting any adverse events following immunization (AEFI) to health personnel (Kemenkes, 2019)

Several factors associated with the completeness of basic immunization include knowledge, occupation, experience, motivation, family support, availability of posyandu facilities, environment, attitudes, health workers, income, and education (BKKBN et al., 2017). Other contributing factors include limited kader knowledge due to insufficient support and low motivation. Low knowledge levels may also be related to lower educational attainment and the age of kader. In this innovation, half of the kader (50%) had secondary education, while smaller proportions had primary (33%) and higher education (17%). Education is closely related to knowledge level, and kader performance in providing health education is associated with their understanding of complete basic immunization. Kader were also found to infrequently accompany mothers and infants to posyandu for registration and immunization services. The primary tasks performed by kader included informing the community about immunization schedules and recording and reporting activities. These activities are essential for ensuring the smooth operation of posyandu services and represent mandatory responsibilities of kader, who are required to report activity outcomes to midwives or local health centers.

Education is the factor with the greatest influence on knowledge, as individuals with higher education levels tend to respond more rationally to information received and consider the benefits of actions for the development of others in achieving specific goals (Helmizar & Rahmi, 2021). Kader knowledge is also essential for early detection of stunting, as adequate knowledge tends to improve the quality of assessments and problem identification. This is necessary to ensure accurate measurements and early identification of growth deviations, allowing for timely interventions to prevent developmental disorders in young children (Himmawan, 2020).

There is no single age limit for active kader; however, several studies indicate that kader aged 25–35 years tend to demonstrate higher motivation and responsibility, while older kader may be better suited for lighter tasks. This innovation found that half of the kader (50%) were in early adulthood, while smaller

proportions were in late adulthood (33%) and late adolescence (17%). Age also influences kader activity levels in posyandu operations. As individuals mature, their cognitive maturity and decision-making abilities improve, enabling them to perform posyandu-related activities more effectively. A kader remains in service until they decide to stop, as there are no regulations specifying limits on tenure or age. Consequently, many older individuals continue to serve as kader, which may result in decreased performance due to declining physical abilities. Therefore, for kader aged over 50 years who are responsible for monthly recording and reporting of posyandu activities, regeneration with younger kader under 35 years of age is recommended, while older kader may be assigned lighter duties appropriate to their physical capacity (Marissa et al., 2019)

Incentives or income constitute one of the primary motivations for work and may be the most significant among other motives such as achievement, self-pride, or self-actualization. Some kader reported that the compensation they received was insufficient; nevertheless, they continued to fulfill their duties and responsibilities as posyandu kader. One of the weaknesses identified in this innovation was limited funding, particularly the absence of budget allocation for transportation of survey personnel within the primary health center budget. Kader who receive adequate compensation tend to be more active in posyandu implementation compared to those with insufficient income, which can influence kader performance. Although kader are community health volunteers expected to provide services voluntarily and sincerely without expecting compensation, they are also individuals with basic needs, including material needs and social recognition (Marissa et al., 2019).

In contrast, Wisnuwardani (2012) stated that financial incentives can improve kader performance; however, government-managed incentive systems may reduce the voluntary nature of kader work and weaken community empowerment (Arifin et al., 2022).

CONCLUSIONS

There was a statistically significant difference in the achievement of complete basic immunization before and after the empowerment of regional kader and dasawisma kader. Empowering dasawisma kader can increase community awareness, motivation, and participation, thereby improving immunization coverage. Continuous kader mentoring, monitoring, community education, collaboration, and sustained motivation are required to maintain and further enhance immunization coverage outcomes. The government plays a crucial role as a facilitator, regulator, resource provider, and supervisor to ensure that regional kader empowerment is effective in increasing immunization coverage.

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