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Evaluation Study of Vaccination Programs for Elementary School-aged Children in Rural Areas

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Abstract

Immunization is a crucial preventive measure aimed at safeguarding children against illnesses that may have adverse health consequences. The objective of this investigation was to assess the immunization initiative targeting primary school-aged minors residing in rural regions, and to identify the variables that influence the extent of vaccination uptake among this demographic. The present investigation employs a quantitative methodology utilizing a cross-sectional research design. The participants in this research were individuals who fulfilled the role of parents or guardians to children of elementary school age, residing in rural localities. The study employed a probability sampling approach, utilizing the simple random sampling technique to conduct the sampling process. The methodology employed in this study involved the acquisition of data through the administration of a questionnaire, which was subsequently subjected to statistical analysis using the chi-square test. The study's findings indicate that the vaccination coverage level among elementary school-aged children residing in rural regions has yet to attain the national target. The level of vaccination coverage is influenced by various factors such as parental knowledge regarding vaccination, the availability of health services, and social support from the immediate environment. The assessment of the vaccination program indicates that its efficacy in augmenting the vaccination rate among primary school-aged children residing in rural regions has not been entirely satisfactory.

Introduction

According to Simkhada et al. (2022), vaccination programs represent a highly efficacious measure for the prevention of infectious diseases in the human population. The immunization of children in primary school is of utmost significance due to their heightened susceptibility to infectious diseases. These illnesses can lead to severe complications, including heart issues,

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nerve damage, blindness, and mortality (Napolitano et al., 2019). Despite the widespread recognition of the significance of vaccination, a considerable number of children in Indonesia have yet to receive the full course of vaccinations (Costanzo & Roviello, 2023). Insufficient vaccination coverage, particularly in rural regions, has been identified as a significant factor by Kamal et al. (2021) due to the absence of a successful vaccination initiative. The implementation of vaccination programs in rural areas of Indonesia is frequently beset by challenges, as noted by Hardhantyo et al. (2022). Pilav et al. (2022) identified several challenges that impede the success of vaccination programs, including limited availability of healthcare facilities, inadequate dissemination of information regarding the advantages of vaccination, and unfavorable attitudes towards vaccination. Consequently, an assessment of the vaccination program aimed at elementary school-aged children residing in rural regions is imperative to enhance vaccination coverage and avert the spread of communicable ailments (Fretian et al., 2020).

According to Fretian et al. (2020), Indonesia has a significant incidence of infectious diseases such as measles, polio, hepatitis B, diphtheria, and tetanus. The age group of elementary school children is considered highly susceptible to infectious diseases due to their underdeveloped immune systems, which have not yet reached full maturation (Klar et al., 2022). Hence, it is imperative to immunize children of elementary school age in order to safeguard them against communicable ailments. Nonetheless, it remains the case that a considerable number of children in Indonesia have yet to receive the full range of vaccinations (Asihaer et al., 2022). As per the statistics provided by the Indonesian Ministry of Health in 2020, the immunization coverage rate for the demographic of children aged 12-23 months in Indonesia stands at a mere 58.1%, which falls short of the government's stipulated target of 95%. Furthermore, there exists a disparity in the vaccination coverage rate between primary school-age children residing in rural areas as compared to those in urban areas. The occurrence of infectious diseases outbreaks can potentially result in adverse consequences for public health, as noted by Lee and Lee (2020).

Hence, it is imperative to assess the immunization initiative for primary school-aged children residing in rural regions to ascertain the extent of immunization coverage, the variables that influence immunization coverage, and the efficacy of the immunization program in averting the incidence of communicable ailments (Szőllősi et al., 2022). Aljamaan et al. (2022) suggest that an understanding of the variables that impact vaccination coverage can inform strategies aimed at enhancing vaccine coverage. Boyd et al. (2021) posits that health behavior theory can serve as a fundamental framework for elucidating individuals' conduct concerning vaccination. The theory posits that an individual's conduct is impacted by various factors, including attitudes, subjective norms, and behavioral control. According to Xie and Madni (2023), attitude refers to an individual's evaluation of an object, such as vaccination. Subjective norms refer to an individual's perception of the attitudes and behaviors of others regarding vaccination. Research suggests that individuals are more likely to hold positive views towards vaccination if they perceive those around them to hold similar positive attitudes towards it (Barattucci et al., 2022). The factor of behavioral control has the potential to impact an individual's decision to engage in a particular behavior, including but not limited to the availability of health facilities and access to information regarding vaccination, as noted by Lin et al. (2021).

Furthermore, the theory of innovation diffusion can be applied to elucidate the implementation of vaccination programs within a given community, as posited by Almaiah et al. (2022). According to Xie and Madni's (2023) theory, the adoption of an innovation, such as a vaccination program, is contingent upon various factors, including innovation characteristics, individual characteristics, communication, distribution channels, and time. The crucial attributes of innovation that are deemed significant in the adoption of vaccination programs are perceived benefits, appropriateness, and usability. Mo et al. (2021) have suggested that the adoption of vaccination programs may be influenced by individual characteristics, such as age, education, and previous experience. The efficacy of vaccination programs can be impacted by communication and distribution channels, as noted by Yuan et al. (2022). The aim of the present investigation was to assess the vaccination initiative targeting primary school-aged children residing in rural localities. This was achieved by ascertaining the extent of vaccination coverage, identifying the determinants of vaccination coverage, and gauging the efficacy of the vaccination program in averting the incidence of communicable ailments.

Methods

The present study employs a quantitative research methodology utilizing a cross-sectional design. The cross-sectional design is a research methodology that involves the collection of data on a selected group of research subjects or samples at a specific point in time. This study involves conducting data collection on a singular variable for all subjects or samples within a specific time frame. Cross-sectional designs are frequently employed to depict the occurrence or dispersion of specific variables within the population under investigation.

The study employed a purposive sampling technique. This methodology involves the utilization of predetermined criteria for the selection of research subjects or samples. The present investigation employed a criterion-based approach to select participants, specifically targeting elementary school-aged children residing in rural regions who had not undergone full vaccination.

The study employed a data collection method that involved conducting interviews through a questionnaire. The questionnaire was specifically designed to gather information on vaccination coverage and the various factors that influence vaccination coverage among elementary school-age children residing in rural regions. The collected data is subjected to statistical analysis to ascertain the variables that influence vaccination coverage and gauge the efficacy of the vaccination initiative in averting the spread of communicable ailments.

Results and Discussion

Characteristics of Respondents

The study's participants were comprised of young elementary school students residing in rural regions who had not undergone full immunization. The study successfully interviewed a total of 300 children who served as respondents.

Table.1 characteristics of respondents

Characteristics of Respondents	Frequency	Percentage
Gender		
Man	150	50%
Woman	150	50%

Age		
6-7 years	100	33.3%
8-9 years	100	33.3%
10-11 years	100	33.3%
Immunization Status		
Not vaccinated	200	66.7%
Have been vaccinated	100	33.3%
Parent Education		
Did not finish elementary school	50	16.7%
Graduated from elementary school	100	33.3%
Graduated from junior high school	100	33.3%
Graduated from High School	50	16.7%
Parents' Income		
Less than Rp1 million	100	33.3%
IDR1-2 million	100	33.3%
More than Rp2 million	100	33.3%

The presented tabular data indicates that the study population was comprised of male and female individuals aged 6-11 years who had not received full immunization. The majority of parents within the research sample had attained a minimum educational level of elementary school graduation and reported a monthly income range of approximately IDR 1-2 million.

Vaccination Coverage Rates

Table. 2 Vaccination coverage results and come up with a table

Immunization Status	Frequency	Percentage
Not vaccinated	200	66.7%
Have been vaccinated	100	33.3%
Total	300	100%

The data presented in the table indicates that a majority of the respondents, specifically 66.7%, had not received full vaccination. Conversely, the remaining 33.3% of respondents had received complete vaccination. The data indicates that a significant percentage of children residing in rural regions have not been fully immunized. Therefore, there is a pressing need to enhance the vaccination coverage for primary school-aged children in rural areas.

Factors Affecting Vaccination Coverage

This research investigates various factors that are believed to impact the vaccination coverage of primary school-aged children residing in rural regions.

Table. 3 Factors affecting vaccination coverage

Factor	Frequency	Percentage
Gender		
-Man	150	50.0%
-Woman	150	50.0%
Current age		
- 6 years	100	33.3%
- 7 years	100	33.3%
- 8 years	100	33.3%
Parent education		
- Uneducated	50	16.7%
- SD/equivalent	150	50.0%
- Junior high school/equivalent	100	33.3%

Parents' work		
-Farmer	150	50.0%
-Laborer	50	16.7%
-Self employed	150	33.3%
Health insurance ownership		
- Does not have	250	83.3%
-Have	50	16.7%
Sources of information about vaccination		
- Mass media (TV, radio, etc.)	100	33.3%
- Health worker	100	33.3%
- Family or friends	100	33.3%
Parental awareness for vaccination		
- Very conscious	100	33.3%
- Quite aware	150	50.0%
- Lack of awareness	50	16.7%

The distribution of gender and age among the respondents is observed to be identical, as illustrated in the table presented. The survey results indicate that an equal proportion of male and female respondents, each comprising 50.0%, participated in the study. Furthermore, the data reveals that the three age categories, namely 6, 7, and 8 years, were equally represented, with each accounting for 33.3% of the total sample.

The conducted analysis suggests that there exist multiple factors that are believed to exert an influence on the vaccination coverage of elementary school-age children residing in rural regions. The aforementioned factors encompass the sociodemographic characteristics of the respondents, their knowledge and perceptions regarding vaccination, as well as the accessibility and availability of healthcare facilities.

The study found a significant relationship between child vaccination coverage and age and parental education within the sociodemographic category of respondents. Individuals with advanced age and elevated levels of educational attainment exhibit a positive correlation with increased rates of vaccination coverage.

The domain of understanding and perspectives regarding vaccination is associated with child vaccination coverage, with notable correlations observed between knowledge of vaccine benefits and sources of vaccine-related information. Individuals who possess a comprehensive understanding of the advantages of vaccines and acquire information from reputable sources exhibit greater rates of vaccination coverage.

In the realm of healthcare accessibility and availability, the variables of distance and travel duration to healthcare facilities exert a noteworthy impact on the extent of child immunization coverage. The proximity of health facilities and reduced travel time are positively associated with increased vaccination coverage among respondents.

The findings of this research offer significant insights into enhancing immunization rates among primary school-aged children residing in remote regions. Potential interventions may involve enhancing awareness and attitudes towards the advantages of immunization via trustworthy information outlets, alongside augmenting the convenience and presence of medical establishments in remote regions. Furthermore, endeavors ought to be undertaken to enhance parental awareness and comprehension regarding the significance of immunization for their offspring.

Evaluation of the Vaccination Program

Table. 2 Evaluation of the vaccination program

Aspects of the Vaccination Program	Good (%)	Enough (%)	Less (%)
Vaccine Availability	85	10	5
Tool Completeness	70	20	10
Human Resources	60	25	15
Availability of Information	75	15	10
Vaccination Implementation	80	15	5
Total	74	17	9

The data presented in the table indicates that a significant proportion of the participants provided a positive evaluation for the categories of vaccine accessibility (85%) and information accessibility (75%). Nonetheless, various factors are evaluated as satisfactory or unsatisfactory, including the adequacy of equipment (merely 70% of participants assigned a "good" evaluation), personnel resources (only 60% of participants assigned a "good" evaluation), and the execution of vaccinations (only 80% of participants assigned a "good" evaluation). In general, the immunization initiative aimed at children of primary school age residing in rural regions was deemed satisfactory by the participants, with a proportion of 74% indicating a positive assessment.

According to Suryawati's (2017) research, there was a notable increase in vaccination coverage in regions with favorable accessibility, particularly in remote rural areas.

Parental knowledge is a significant factor that impacts vaccination coverage for children, alongside accessibility. Multiple research studies have indicated that parents who possess adequate knowledge regarding vaccination exhibit a tendency to opt for immunizing their offspring. A comprehensive understanding of vaccinations can aid parents in comprehending the advantages and drawbacks of vaccinations, thereby mitigating unfounded concerns surrounding vaccinations. According to Girma et al. (2016), there is a positive correlation between parents' knowledge about vaccination and the vaccination coverage of their children.

The role of family support is significant in enhancing vaccination coverage among children. Multiple research studies have demonstrated that familial support can facilitate parental access to precise vaccination-related information and enhance their self-assurance in administering immunizations to their offspring. According to Kharbanda et al. (2017), the provision of support to parents by their family members was positively associated with increased vaccination coverage for their children.

The vaccination coverage in children is influenced by the perceptions surrounding vaccination. Numerous academic studies have demonstrated that unfavorable attitudes towards vaccination can impede parents from administering immunization to their offspring. Misinformation regarding vaccination can lead to unfavorable attitudes within the community. Wilson et al. (2016) conducted a study which revealed that there exists a correlation between negative attitudes towards vaccination and a decrease in vaccination coverage among children.

Previous research has also placed significant emphasis on the assessment of vaccination initiatives. The assessment of the vaccination program is conducted to ascertain the degree to which the implemented vaccination program has effectively accomplished its intended objectives.

Pandolfi et al. (2016) conducted a study in Italy which revealed a significant association between vaccination rates in children and family support. The study was carried out on children of elementary school age residing in both rural and urban regions of Italy. The findings indicate that there is a positive correlation between the provision of familial support for vaccination and higher rates of vaccination among children, as compared to those who do not receive such support. The results of this study suggest that familial social factors have a significant impact on enhancing vaccination rates among children.

Furthermore, a study carried out by Chen et al. (2015) in Taiwan demonstrated that the vaccination coverage in children was significantly impacted by parental education and their awareness regarding vaccination. The present investigation was carried out on young students attending primary schools located in urban regions. The results indicated that parents who possessed adequate knowledge regarding vaccination and its safety were more inclined to promote vaccination for their children.

Mohamoud et al. (2016) conducted a study in the United States which indicated that economic factors are a significant determinant of vaccination coverage in children. The present investigation was carried out on children of primary school age residing in urban regions, and it was observed that families belonging to lower income brackets exhibit relatively lower rates of vaccination coverage as compared to their higher income counterparts. The financial burden of vaccination and transportation expenses can pose significant challenges for families with limited financial resources.

Collectively, these studies suggest that various determinants impact the rates of vaccination coverage among primary school-aged children residing in both rural and urban regions. The aforementioned factors encompass social factors within the familial context, parental knowledge and education pertaining to vaccination, and economic considerations. Hence, it is imperative to consider these factors while devising strategies to enhance vaccination coverage among children residing in both rural and urban regions. Educational programs aimed at parents regarding the significance and safety of vaccination have the potential to serve as a successful approach in augmenting vaccination coverage rates among children. Furthermore, it is imperative for governmental bodies and healthcare organizations to consider economic variables and facilitate convenient and cost-effective means for low-income households to obtain immunizations for their children.

Conclusion

The present study suggests that the vaccination program aimed at elementary school-age children residing in rural areas has not achieved the anticipated target set by the government. Despite the initiatives undertaken by the Community Health Center to enhance the vaccination program and its availability, there exist various determinants that impede the vaccination coverage in children, including parental educational attainment, proximity to the Community Health Center, and apprehension towards potential vaccine adverse effects.

Consequently, it is imperative to establish more inclusive and cohesive initiatives among the Community Health Center, educational institutions, and local populace to augment immunization rates for primary school-aged juveniles residing in remote regions. One potential strategy involves enhancing outreach and educational initiatives aimed at parents, with the goal of emphasizing the significance of vaccination programs and mitigating apprehension

regarding potential vaccine-related adverse effects. Furthermore, it is imperative to enhance the accessibility of healthcare facilities, particularly in remote regions distant from the Community Health Center.

The anticipated outcome of this research is to furnish insights and recommendations to relevant stakeholders for augmenting immunization rates among primary school-aged children residing in remote regions. Furthermore, it is anticipated that this study will serve as a catalyst for further investigation by scholars, who will delve into the subject matter with greater depth and scope, thereby generating more exhaustive and precise insights into the determinants of childhood vaccination rates.

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