

Exploring the Relationship Between Immunisation and Stunting: Understanding the Impact of Vaccinations on Child Growth and Development

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Abstract

The study aimed to investigate the relationship between stunting and immunisation completeness among children under five years old in Indonesia. The study used a cross-sectional design with a quantitative approach, utilising secondary data from the Indonesian Family Life Study (IFLS) V big data in 2014. The sample consisted of children aged 12-59 months from 13 provinces in Indonesia, representing 83% of the total population. Data were analysed using SPSS and STATA programs. Statistical analysis was performed to determine the association between immunisation status and stunting. The results showed a significant statistical relationship (p -value < 0.05) between immunisation status and stunting occurrence among children aged 12-59 months in Indonesia, with a p -value of 0.001 and a PR value of 1.2 (95% CI: 1.14-1.6). Children who receive incomplete immunisation have a 1.2 times greater risk of stunting than those who receive complete immunisation. The study concluded that immunisation completeness is associated with checking among children under five years old in Indonesia. Therefore, it is essential to ensure full immunisation coverage to prevent stunting in this population.

Keywords: Stunting; Completeness of immunisation; Children; Cross-sectional design; Indonesia

Introduction

Immunisation and stunting are two critical issues in child health and development. Immunisation is a preventive measure that protects children from vaccine-preventable diseases, while stunting is a condition characterised by impaired growth and development due to malnutrition (World Health Organization [WHO], 2021). The relationship between immunisation and stunting has been explored in various studies, with some suggesting a positive association between vaccination coverage and child growth (Khan et al., 2021), while others indicate no significant correlation (Briend et al., 2017). Therefore, it is essential to understand the impact of vaccinations on child growth and development to improve child health outcomes.

Several studies have shown that immunisation can positively impact child growth and development. For instance, a study conducted in Ethiopia found that vaccination coverage was significantly associated with

better child growth outcomes, including reduced stunting and underweight (Ayele et al., 2021). Another study in Nigeria reported that measles vaccination was associated with improved growth in children aged 6-59 months (Olawepo et al., 2017). Similarly, a study in India found that vaccination coverage was positively associated with higher height-for-age z-scores (HAZ) among children aged 6-23 months (Chakrabarti et al., 2020). These findings suggest that vaccination programs can be crucial in reducing the prevalence of stunting and improving child growth.

On the other hand, some studies have reported no significant association between immunisation and stunting. For instance, a study in Bangladesh found that vaccination status was not significantly associated with child growth outcomes, including stunting and being underweight (Chowdhury et al., 2021). Another study in Pakistan reported no significant correlation between immunisation and HAZ or weight-for-height z-scores (WAZ) among children aged 12-23 months (Shahid et

al., 2019). Similarly, a study in Indonesia found no significant association between vaccination coverage and stunting or underweight among children aged 6-59 months (Nahar et al., 2019). These findings suggest that the impact of vaccination on child growth and development may vary across different contexts and populations.

Despite the mixed findings, several mechanisms have been proposed to explain the potential impact of vaccinations on child growth and development. One mechanism is the prevention of vaccine-preventable diseases, which can cause malnutrition and growth impairment in children (Bhutta et al., 2021). Vaccines can also stimulate the immune system, reducing inflammation and improving nutrient absorption, contributing to better growth outcomes (Briend et al., 2017). Furthermore, vaccination programs can provide an opportunity to deliver other health interventions, such as deworming and nutrition education, which can also improve child growth (Sultana et al., 2021).

Methods

This study used a cross-sectional design with a quantitative approach, using secondary data from the Indonesian Family Life Study (IFLS) V big data in 2014. The study aimed to identify the relationship between stunting and the completeness of

immunisation in children under five. The sample for the study consisted of children aged 12-59 months from 13 provinces in Indonesia, representing 83% of the total population. The minimum sample size for analysis was calculated to meet the strength test, which needed to be above 80% of the calculation.

Several steps were taken during the study to ensure accuracy and minimise errors. These included accessing the IFLS-V platform to retrieve data, determining variables based on exposure and exposure, and preparing correspondence. The preparations involved formulating the problem and the condition to be achieved, conducting a literature review to create a research concept, consulting with a supervisor, conducting a preliminary survey, and determining research variables.

Data management involved taking panel data from the IFLS-V survey using SPSS and STATA programs. The data set retrieval was conducted to combine data fragments from each variable needed for data analysis. Data merging had to be performed between variables in the IFLS dataset using the merge command in STATA. No ethics approval was required since the data was available and accessible freely on the website.

Results

Table 1. Relationship Between Immunisation and Stunting in Children Aged 12-59 Months from IFLS-V 2014 Data in Indonesia

Immunisation	Standard Deviation			PR (95% CI)	P- value
	<-2 SD n(%)	>-2 SD n(%)	Total n(%)		
In-Complete	308 (43,7)	397 (56,3)	705 (100)	1,2	0,001
Complete	783 (36,4)	1367 (63,6)	2150 (100)	(1,14-1,6)	
Total	1091 (38,2)	1764 (61,8)	2855 (100)		

Source: Primary data, 2020

Table 1. presents a significant statistical relationship (p-value <0.05) between immunisation status and stunting occurrence among children aged 12-59 months in Indonesia, with a p-value of 0.001 and a PR value of 1.2 (95% CI: 1.14-1.6). This indicates that children receiving incomplete immunisation have a 1.2 times greater risk of stunting than those receiving complete immunisation.

Discussion

The relationship between immunisation status and stunting occurrence among children has been a topic of interest for researchers and policymakers alike. The present study adds to the growing body of literature on this topic by providing evidence of a statistically significant relationship between immunisation status

and stunting occurrence among children aged 12-59 months in Indonesia (Lestari et al., 2020). The finding that incomplete immunisation is associated with a greater risk of stunting highlights the importance of achieving high immunisation coverage rates to promote child growth and development.

One possible explanation for the relationship between immunisation status and stunting occurrence is that immunisation protects children from infectious diseases that can cause malnutrition and hinder growth (Bhutta et al., 2021). Vaccines prevent illness and reduce the risk of secondary infections that can exacerbate malnutrition and stunting (Briend et al., 2017). Thus, complete immunisation can contribute to a positive cycle of health and growth for children.

Furthermore, immunisation can indirectly improve child nutrition by promoting maternal health and



increasing household food security (Nahar et al., 2019). Vaccination programs often include nutrition education and other maternal and child health services that can improve maternal and child health outcomes, including child growth (Chakrabarti et al., 2020). In this way, immunisation can substantially affect child growth and development.

However, it is essential to note that the relationship between immunisation status and stunting occurrence is likely bidirectional. Stunted children may have weaker immune systems and be more susceptible to infectious diseases, affecting their immunisation status (Bhutta et al., 2021). Factors such as poverty, inadequate access to healthcare, and poor sanitation can also contribute to incomplete immunisation and stunting (Chowdhury et al., 2021). Thus, a comprehensive approach is needed to address the complex and multifaceted causes of malnutrition and stunting.

The present study contributes to a growing body of literature on the relationship between immunisation and child growth and development. However, further research is needed to explore the mechanisms underlying this relationship and identify effective interventions to promote immunisation and child growth. Future studies could also examine the relationship between specific types of vaccines and child growth outcomes, as well as the potential interactions between vaccines and other interventions such as nutrition programs.

In conclusion, the present study provides evidence of a significant relationship between immunisation status and stunting occurrence among children aged 12-59 months in Indonesia. The finding highlights the importance of high immunisation coverage rates to promote child growth and development. Further research is needed to fully understand the mechanisms underlying this relationship and identify effective interventions to promote immunisation and child growth.

Conclusion

In conclusion, the study provides significant evidence of a relationship between immunisation status and stunting occurrence among children aged 12-59 months in Indonesia. The findings suggest that incomplete immunisation may increase the risk of stunting in children, highlighting the importance of achieving high immunisation coverage rates to promote child growth and development. However, further research is needed to fully understand the underlying mechanisms and identify effective interventions for promoting immunisation and child growth.

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Author Contribution and Competing Interest

IM provided the concept for writing and overseeing the writing process. K analysed data and wrote the article, with HMA also contributing. Others provided input and suggestions for improving the article. All authors made contributions to the writing of the article.

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