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The Role of ANC, Posyandu, and Immunization Visits in Preventing Stunting in Toddlers: A Case Study in West Sumba District

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ABSTRACT

Stunting in children under five is a serious global health problem, including in West Sumba Regency, Indonesia. Data from the West Sumba District Health Office shows that out of 100 toddlers, 12 are underweight, 30 are stunted, and 5 are obese. The stunting rate in West Sumba in 2018 also increased compared to 2016 and 2017, from 29.6% to 36.4% or 364 cases.Data from the West Sumba District Health Office shows that the second highest number of stunted infants is at the Puuweri Community Health Center . This study aims to identify the relationship between ANC visits, Posyandu, and immunization with the incidence of stunting in toddlers in West Sumba Regency. This study used an analytical observational research design with a cross- sectional study type. Data were obtained through interviews with pregnant women and parents of children under five who actively participated in ANC visits, Posyandu, and immunization in the region. The calculation results show that the required sample size is 88. Data analysis involved a chi-square test to identify the relationship between ANC, Posyandu, and immunization visit variables and stunting incidence. The results showed that there was a significant relationship between ANC visits (p = 0.000), Posyandu (p = 0.000), and immunization (p = 0.000) with the incidence of stunting in toddlers in West Sumba Regency. Participation in ANC, Posyandu, and immunization visits plays an important role in reducing the risk of stunting in toddlers in West Sumba Regency.

***Keywords**: Stunting; West Sumba Regency; ANC Visit; Posyandu; Immunization*

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INTRODUCTION

Stunting is a serious global health problem that adversely affects children's physical, mental, and health development. In Indonesia, the problem of stunting has reached alarming levels, with more than a third of children under the age of five suffering from the condition. Based on the 2024 Indonesian Nutrition Status Survey (SSGI), the national prevalence of stunting has fallen to 19.8%, falling below 20% for the first time. This result exceeds Bappenas projections and shows a downward trend in stunting compared to previous years, such as 21.6% in 2022. West Sumba Regency is one of the regions that also faces serious problems related to stunting, with prevalence that continues to increase from year to year (1).

The problem of stunting is not only a national concern, but also a global issue that affects the welfare of children around the world. Stunting has long-term impacts, such as decreased productivity in adulthood, and an increased risk of chronic disease.(2) Therefore, understanding the factors that contribute to stunting, such as ANC visits, Posyandu, and immunization, has important implications for improving children's health at the global level (3).

This research has high relevance in the disciplines of public health and nutrition. Examining the relationship between maternal health services (ANC visits), child health services (Posyandu), and immunization status with the incidence of stunting will provide deeper insight into the factors that play a role in overcoming the problem of stunting (4). This will help develop more effective intervention programs focused on improving children's well-being.

In the context of West Sumba Regency, the incidence of stunting has increased from year to year. Therefore, this research is very relevant and urgent to be carried out urgently to provide a solid basis for planning and implementing intervention programs that can reduce stunting rates in a faster time. The prevalence of stunting in West Sumba, according to 2024 data, is around 21.5% based on the total number of short and very short children out of 11,194 toddlers measured. This figure is the result of measurements taken in February 2024, although data from May 2024 is currently being validated. The number of short toddlers reached 1,972 and very short toddlers reached 639.

The condition of stunting in West Sumba Regency is a public health problem that requires serious attention. The high prevalence of stunting indicates a problem in the child and maternal health care systems in the region. Therefore, this study is considered important to identify factors that contribute to stunting and produce recommendations for improvement.

Several previous studies have identified factors such as infectious diseases, parenting, and the use of health services as causes of stunting (1,5,6) However, there has been no in-depth research on the relationship between ANC visits, Posyandu visits, and immunization status with the incidence of stunting in West Sumba Regency. Therefore, this research will fill this knowledge gap and provide a more complete understanding.

While there is a common understanding of the factors that contribute to stunting, there is still controversy in the extent to which these factors play a role in various geographic contexts Therefore, it is important to identify how these factors may vary in the context of West Sumba Regency. Previous research may not have specifically identified the relationship between ANC visits, Posyandu visits, and immunization status with the incidence of stunting in West Sumba District Therefore, this study will try to fill this deficiency by conducting a more in-depth analysis.

A knowledge gap identified in this field of study is a lack of understanding of how ANC visits, Posyandu visits, and immunization status can affect the incidence of stunting in children in West Sumba District. Quality antenatal care (ANC), integrated health service posts (Posyandu), and immunization can influence stunting through growth monitoring, disease prevention, and nutrition education for mothers and children. Quality ANC and complete immunization can prevent stunting in children by reducing the risk of infection and nutritional deficiencies in the fetus. Posyandu plays an important role in monitoring the growth and development of toddlers, providing nutritional supplementation, and educating about nutrition and health.

Monitoring maternal health: Quality ANC ensures that pregnant women receive optimal health monitoring and care during pregnancy, which is very important for fetal growth and development. Risk reduction: Mothers who do not receive quality ANC are at greater risk of

having stunted children, because health problems that may arise during pregnancy are not monitored and treated. Growth monitoring: Posyandu routinely monitors children's growth through weighing, height measurement, and head circumference, which are recorded in the Health Card (KMS). This allows for early detection of growth problems. Prevention of infectious diseases: Complete immunization protects children from various infectious diseases such as diphtheria and measles, which can hinder growth and increase the risk of stunting.

The purpose of this study was to identify and analyze the relationship between ANC visits, Posyandu visits, and immunization status with the incidence of stunting in toddlers in West Sumba Regency. This study aims to provide better insight into the factors contributing to the problem of stunting in the region and provide recommendations for the improvement of child and maternal health services.

METHODS

This study still uses an analytical observational research design with a cross-sectional type of study, but with a more specific focus on the relationship between ANC visits, posyandu, and immunization with the incidence of stunting in children under five. Research population all children under five (0–59 months) and their mothers/guardians residing in West Sumba District during the research period. Samples were taken using stratified random sampling from 88 toddlers. Data will be collected through interviews with pregnant women and parents of children under five who actively participate in ANC visits, posyandu, and immunization in the same area. In addition, secondary data from local health institutions will also be used to corroborate the findings.

Data processing of research results was carried out through the stages of editing, coding, tabulating, data entry, and data cleaning. Data processing for ANC visits, Posyandu, and immunization used the results of structured questionnaire interviews. Meanwhile, stunting data was processed by comparing the results of weight measurements with height measurements, which were then converted into z-scores using the WHO Anthro application. Data analysis was performed univariately to examine distribution and frequency, as well as

bivariately using the Chi-square test with a 95% significance level. This study received ethical approval from the Ethics Committee with number 156/ EC/ KEPK-BU/III/ 2023.

RESULTS

Total of 88 respondents contributed to the study. The data are presented in the following table 1.

Table 1. Characteristics of Respondents

Characteristic	n	%
Age of Toddler		
12 – 24 months	35	39,77
24 – 36 months	28	31,81
36 – 48 months	20	22,72
48 – 60 months	5	5,68
Gender toddler		
Female	53	88,63
Male	35	11,36
Mother's Education		
Did not finish elementary school	10	22,4
Junior High School	67	76,13
Senior High School	11	12,5
ANC History		
Never	20	16.48
1-3 times	25	28,4
>4 times	43	48,9
Posyandu History		
No Posyandu	24	27,3
Posyandu	64	72,7
Stunting Events		
Stunting	24	27,3
Tidak Stunting	64	72,7
Immunization		
Not Immunized	24	27.3
Immunization	64	72.7

Sources : primary data 2023

From the age data of toddlers, most of the toddlers who were sampled in the study were in the age range of 12 to 36 months, with about 39.77% aged 12-24 months and 31.81% aged 24-36 months. Overall, most toddlers in the study were under 36 months old. When looking at gender, most of the sample is female (88.63%) compared to male (11.36%).

In terms of maternal education, most of the mothers of toddlers in the study had completed junior high school (76.13%), while a small percentage did not finish elementary school (22.4%) and about 12.5% had completed high school. A history of toddler visits to ANC services shows that most toddlers have visited the service more than 4 times (48.9%), while around 28.4% of toddlers have visited ANC 1-3 times, and 16.48% have never visited it.

Furthermore, posyandu visit history shows that most toddlers have visited posyandu (72.7%), while 27.3% have never visited it. Finally, in terms of stunting, around 27.3% of children under five are stunted, while 72.7% are not stunted. The results show a significant relationship between immunization and stunting, with 72.7% of respondents who brought their children for complete immunization not experiencing stunting, while 27.3% of respondents who did not immunize their children experienced stunting.

Table 2. The Relationship between ANC Visit and Stunting Events

ANC History	Stunting Event				Total		*p-value*
	Stunting		No Stunting				
	n	%	n	%	n	%	
Never	20	83,3%	0	0	20	23%	0.000
1-3 times	3	12,5%	22	34%	25	28%	
> 4 times	1	0,04%	42	66%	43	49%	
Total	**24**	**100%**	**64**	**100%**	**88**	**100%**	

Sources : primary data 2023

The results showed that toddlers who never had an ANC visit had a higher risk of stunting compared to toddlers who made ANC visits, especially those who visited more than 4 times. The importance of ANC visits in stunting prevention in toddlers can be seen from the very low P-Value (0.000) in the "Never" group, indicating strong statistical significance in this relationship. In other words, this study confirms that regular ANC visits during pregnancy have an important role in reducing the risk of stunting in toddlers.

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Table 3. The Relationship between Posyandu Visit and Stunting Events

Posyandu	Stunting Event				Total		*p-value*
	Stunting		No Stunting				
	n	%	n	%	n	%	
No Posyandu	24	100%	0	0%	24	27%	0.000
Posyandu	0	0%	64	100%	64	73%	
Total	**24**	**100%**	**64**	**100%**	**88**	**100%**	

Sources : primary data 2023

Table 3 shows that there is a significant relationship between posyandu visits and stunting, with 27.3% of respondents who did not attend posyandu experiencing stunting, while 72.72% of respondents who attended posyandu did not experience stunting.

Table 4. The Relationship between immunization Visit and Stunting Events

Posyandu	Stunting Event				Total		*p-value*
	Stunting		No Stunting				
	n	%	n	%	n	%	
Tidak Imunisasi	24	100%	0	0%	24	27%	0.000
Imunisasi	0	0%	64	100%	64	73%	
Total	**24**	**100%**	**64**	**100%**	**88**	**100%**	

Sources : primary data 2023

From the results of the research contained in Table 4 is that there is a very strong and significant relationship between immunization history and the incidence of stunting in toddlers. The results of this study showed that toddlers who did not have a history of immunization had a much higher risk of stunting compared to toddlers who had been immunized. In the "No Immunization" group, which consisted of 24 toddlers, all toddlers were stunted, and none were not stunted. This is reflected in a very low P-Value (0.000), which indicates a very high statistical significance in this relationship. Meanwhile, in the "Immunization" group, none of the toddlers were stunted, and 64 toddlers who had been immunized were not stunted.

DISCUSSION

Stunting, which is often caused by nutritional problems and inadequate parenting, is a serious health problem in children in various developing countries, including Indonesia. Previous studies have highlighted various factors that can contribute to the incidence of stunting, including low participation in ANC visits, posyandu, and immunization

This study aims to identify the relationship between ANC visits, posyandu, and immunization with the incidence of stunting in toddlers. Previously, the results of similar studies showed that these factors can affect children's nutritional status However, this study tries to provide a deeper understanding of the relationship in the context of a region that has not been studied much, namely West Sumba Regency.

Some Results The results of this study show that there is a strong relationship between visits to ANC, posyandu, and immunization with the incidence of stunting in toddlers in West Sumba Regency. The most interesting finding was that toddlers who did not attend ANC, posyandu, and immunization visits had a higher risk of stunting. This indicates that public health programs such as immunization can play an important role in stunting prevention. A surprising result was that not a single immunized toddler was stunted.

This underscores the important potential of immunization programs in reducing the risk of stunting. These results are consistent with previous research showing that ANC, posyandu, and immunization visits have a positive impact on children's nutritional status. Contrary to Previous Findings However, these results also contrast with several previous studies that did not find a strong association between these factors and the incidence of stunting . This may be due to differences in population characteristics or other factors that were not considered.

The explanation for these findings may lie in the role of better public health programs in West Sumba District compared to other regions studied. More ANC, posyandu and immunisation visits by pregnant women and children under five may explain why stunting rates are lower in the region. Although these results show a significant association, keep in mind that this study only explored the relationship between certain variables and the incidence of stunting. More research is needed to understand other factors that may

contribute to stunting. A common hypothesis that can be proposed based on these findings is that increased participation in ANC visits, posyandu, and immunization can help reduce the risk of stunting in toddlers.

Administratively, services appear to have been provided (e.g., ANC visits recorded, posyandu running, immunizations available), but the quality of interventions is often suboptimal. Examples: ANC is only recording, not quality service, ANC focuses only on basic measurements, without effective nutrition counseling, Iron tablets are not taken by mothers (low compliance rate), Early detection of anemia, infections, or KEK is not followed up, The quality of KIA filling is low, so the data does not reflect the actual situation, The implication of these findings is the importance of increasing the coverage of ANC, posyandu, and immunization visits in the West Sumba Regency area. These measures can help reduce the incidence of stunting and improve the well-being of children in the region. Many primary or intermediate health posts offer limited services: weighing without counseling, no comprehensive PMBA education, manual records are not interpreted, and cadres are poorly trained. Stunting occurs most frequently during:

The first 1,000 days of life (HPK), especially between the ages of 6 and 24 months. The problem: Many mothers start ANC late (2nd–3rd trimester), complementary feeding education is provided after children have already developed poor eating habits, and nutritional interventions (PMT, education) are often only provided when children are already stunted, rather than when the risk first appears. Stunting is not only a health issue, but a multidimensional problem. Factors that remain untouched despite health services: Poor sanitation, open defecation recurrent infections (diarrhea, intestinal worms). Poverty that prevents access to nutritious food, low food access (remote areas, islands, mountains), eating cultures and taboos that limit the intake of pregnant women and toddlers.

It is important to acknowledge that these results can contribute to improvements in public health programs in the region. In addition, these findings may lay the foundation for further research that may include other factors that influence stunting. For future work, further research can expand the scope of variables and populations studied. In addition, the

evaluation of existing public health programs can be an important step in efforts to prevent stunting in children in various regions.

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of research on the relationship between ANC (Antenatal Care) visits, posyandu activity, and immunization status with stunting, it can be concluded that ANC visits have a significant relationship with stunting. Mothers who attend all ANC visits (at least 6 times during pregnancy) are more likely to give birth to children with normal growth compared to mothers who rarely attend ANC visits. Based on the results of the research and conclusions above, the following recommendations are made for Health Workers: Increase educational activities for pregnant women and mothers of young children regarding the importance of antenatal care visits, active participation in integrated health service posts (posyandu), and complete immunization. Conduct routine monitoring of pregnant women and children at high risk of stunting and provide timely nutritional interventions.For the Government and Community Health Centers, strengthen collaborative cross-sector programs (nutrition, maternal and child health, immunization, and health promotion) in stunting prevention, provide facilities and infrastructure that support posyandu activities and ANC services, including improving the competence of posyandu cadres. For the Community and Families, pregnant women are expected to attend ANC visits according to schedule and follow the advice of health workers, parents are expected to actively bring their children to posyandu every month to monitor their growth and complete their basic immunizations, the community can support posyandu activities as a form of participation in stunting prevention efforts in the neighborhood. For Future Researchers, other related variables can be added, such as nutritional intake, socioeconomic status, parenting patterns, or environmental factors to provide a more comprehensive picture of the determinants of stunting.

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