



Determinant factors of stunting in children 2-5 years in West Aceh District, Indonesia

Determinan faktor stunting pada balita usia 2-5 tahun di Kabupaten Aceh Barat, Indonesia

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Abstract

The prevalence of stunting in children under five years of age in Indonesia, and Aceh in particular, is still very high. This condition affects the quality of human resources and future economic growth. This study examined the determinants of stunting among children under five years of age 24-59 months in West Aceh District, Aceh Province, Indonesia. The research method was a cross-sectional study design, using secondary data from the EPPGBM and PIS-PK data from the Health Center in 2020. The sample comprised 386 families with children under five. Data were collected through documentation studies from PIS-PK data and stunting data from the E-PPGBM data. Family data matching was performed using the National Identity Number (NIN). Statistical analysis was performed using a Multiple Logistic Regression test with 95% confidence interval (CI). The results showed a significant association between exclusive breastfeeding (OR= 2,81; p= 0,010), latrine use (OR=1,73; p= 0,043), and smoking (OR= 1,62; p= 0,022) with the prevalence of stunting. Furthermore, exclusive breastfeeding was a determining factor for the incidence of stunting in toddlers (OR= 2,36; p= 0,010). In conclusion, exclusive breastfeeding practices are a determinant factor of stunting in children under five in West Aceh, so structured efforts need to be made to increase exclusive breastfeeding coverage by strengthening nutrition counseling and breastfeeding preparation for pregnant women up to two years.

Keywords: Exclusive breastfeeding, stunting, sensitive indicators, specific indicator, surveillance

Abstrak

Prevalensi stunting pada anak balita di Indonesia dan Aceh khususnya masih sangat tinggi, kondisi ini berdampak pada kualitas sumberdaya manusia dan pertumbuhan ekonomi dimasa depan. Penelitian ini bertujuan untuk melihat determinan kejadian stunting pada balita usia 24-59 bulan di Kabupaten Aceh Barat, Provinsi Aceh, Indonesia. Metode penelitian berdesain crossectional study, menggunakan data sekunder EPPGBM dan data PIS-PK tahun 2020. Sampel sebanyak 386 keluarga yang memiliki anak balita. Pengumpulan data melalui studi dokumentasi dari data PIS-PK, sedangkan data stunting dari data E-PPGBM. Pencocokan data keluarga dilakukan dengan menggunakan NIK. Analisis statistik menggunakan uji Regresi Logistik Berganda dengan nilai CI 95%. Hasil menunjukkan terdapat hubungan signifikan ASI eksklusif (OR= 2,81; p= 0,010), pengguna jamban (OR=1,73; p= 0,043), dan merokok (OR=1,62; p= 0,022) dengan kejadian stunting. Selanjutnya, faktor determinan kejadian stunting pada balita adalah ASI Eksklusif (OR=2,36; p= 0,010). Kesimpulan, praktik pemberian ASI eksklusif merupakan determinan faktor stunting pada anak balita di Aceh Barat, sehingga perlu dilakukan upaya terstruktur untuk meningkatkan cakupan pemberian ASI

Eksklusif melalui penguatan konseling gizi dan persiapan menyusui bagi ibu hamil sampai 2 tahun.

Kata Kunci: ASI Eksklusif, indikator sensitif, indikator spesifik, stunting

Introduction

Stunting is a nutritional problem for toddlers in the world today, especially in developing countries, which are characterized by heights not in accordance with their age and less height compared to other children their age (Sulistyoningsih, 2020). The problem of stunting in the long term, if not resolved, will have a negative impact on the quality of life of children in terms of achieving growth and development, impaired intellectual development, inhibited motor development, mental health, and vulnerability to non-communicable diseases (Siallagan et al., 2021).

Globally, the prevalence of stunting in 2019 was 149 million children under the age of five (Torlesse et al., 2016). UNICEF and World Health Organization (WHO) states that the percentage of stunted children in the world has decreased slowly from 32,6% in 2000 to 39% in 2017. Globally, stunted children under five reached 154,8 million (22,2%), of which 55% of stunted children in the world came from Asia and 39% from Africa. Asia is the highest contributor to the stunting rate, where the highest proportion of stunting in Asia is in South Asia (58,7%), and the least proportion is in Central Asia (0,9%) (WHO, 2018).

The stunting rate in Indonesia ranks fifth in the world, while Indonesia ranks third as a country with the highest stunting prevalence in the Southeast Asian region (Kemenkes, 2019). The average prevalence of stunting in Indonesia in 2015–2017 was 36,4%. In 2007, the prevalence of stunting was 36,8% higher than the prevalence of stunting in 2010, which was 35,6%. In 2013, nationally, the prevalence of stunting in toddlers again increased to 37,2%, and in 2018, there was a decrease to 30,8% (Kemenkes, 2019). This illustrates that stunting is a serious nutritional problem that must receive specific attention from various sectors (Torlesse et al., 2016; Bzikowska-Jura et al., 2018).

Aceh is a province with stunting prevalence; it is ranked 3rd out of 34 provinces in Indonesia with stunting prevalence in toddlers, which is 37,3%, which means that 1 in

3 children under five in Aceh is stunted (Kemenkes, 2018). In 2007, the prevalence of stunting in Aceh province was 44,6%; in 2010, there was a decrease to 39%; in 2013, it was 41,5%; and in 2018, it decreased to 37,7% (Balitbangkes, 2018). Based on the West Aceh District Health Office Report in 2016, the incidence of stunting was reported at 36,3%; in 2017, the stunting problem decreased from the previous year, which was 33,2%. In 2018, the incidence of stunting increased again to 43,2% (Sriyanti et al., 2019; Farisni & Zakiyuddin, 2020).

Stunting is caused by multi-factors, namely: low birth weight, history of exclusive breastfeeding, infectious diseases, quality and amount of complementary foods, hygiene practices, education, employment, basic health, family income, maternal age, parity, and pregnancy factors (Indriani et al., 2018; Al Rahmad et al., 2020; Mulyani et al., 2022).

The government has adopted a number of health policies to reduce stunting in Indonesia, including supplementary feeding, interventions in the first 1,000 days of life, and the Healthy Indonesia Program with Family Approach (Indonesia call a PIS-PK) (Kemenkes, 2016). The family-based Healthy Indonesia Program aims to improve the degree of public health and nutrition through health services and community empowerment by supporting budget protection and the equitable distribution of health services (Rusdianah & Widiarini, 2019; Zulaikha et al., 2021).

Several studies show that the incidence of stunting is influenced by maternal age, maternal height, dietary parenting, health, and sanitation (wastewater disposal, family latrines, and the availability of clean water). While the strongest predictor factor in predicting the incidence of stunting is smoking behavior (Desyanti & Nindya, 2017; Susianti & Lestari, 2020).

Based on the PIS-PK data report, Indonesia is still far from meeting the Healthy Family Indicator (HFI), with a standard value of IKS > 0,8. Indonesia's HFI score is only 0,186, which is in the category of unhealthy families. Of the 34 provinces, not a single region achieved the value of the healthy family indicator. PIS-PK

coverage data of Aceh Province also has an HFI value below the healthy family standard, only 0,264, and only one region, namely Banda Aceh City, from 23 city districts in Aceh, reached an HFI value of 0,565, which shows the HFI value is in the category of healthy families (Agustina et al., 2018; Kemenkes, 2020).

The results of the preliminary study of researchers through electronic information data recording community-based nutrition reporting (E-PPGBM) on toddlers aged 24-59 months in West Aceh in 2020 from a total of 3347 toddlers found 740 stunting toddlers, spread across 13 public health center work areas (Dinas Kesehatan Aceh Barat, 2020). Based on the accumulated results of 12 healthy family indicators, the HFI value is 0,244, which is still far below the standard of healthy family indicators. Based on the above problems, this study aims to analyze the determinants of stunting factors based on indicators of the Family-Based Healthy Indonesia Program (PIS-PK).

Methods

This study used an observational approach with a cross-sectional design to analyze the determinants of stunting incidence in toddlers aged 24-59 months, carried out in West Aceh District in 2022. The study used secondary data, namely electronic data recording community-based nutrition reporting (E-PPGBM) and data on the Family-Based Healthy Indonesia Program (PIS-PK) of the West Aceh Health Office in 2020.

The process of matching research data (matching) to determine the number of samples using the National Identity Number (NIN) of toddlers from EPPGBM and PIS-PK data of the 3,347 families with toddlers aged 24-59 months, 386 samples were in accordance with NIK between E-PPGBM data and PIS-PK data that were sampled.

The data used were stunting data using the LFA index for children aged <24 months and HFA for children ≥24 months, taken from EPPGBM data, while the determinant factor data analyzed, namely, immunization status, exclusive breastfeeding, growth monitoring, use of contraceptive equipment, ownership of National Health Insurance, smoking behavior, clean water sources, use of latrines, and

childbirth in health facilities, were taken from PIS-PK data.

The data were analyzed using univariate, bivariate, and multivariate analyses. Bivariate analysis was performed using the chi-squared test. Multivariate analysis to determine the most dominant factor was performed in two stages: analysis of all variables ($p < 0,25$) and further analysis of variables ($p < 0,05$). Multivariate analysis was performed using a Logistic Regression statistical test at a 95% confidence level.

Result and Discussion

Sample characteristics and families

The results of the study (Table 1) showed that the study sample was mostly aged between 48 and 59 (49,48%) with male sex (45,60%). Most of the sample had parents with a paternal age <35 years (73,83%) and mothers with the age between 20 and 35 years (63,99%), and most of the distance between children who > 2 years (62,44%), and with the number of children ≤2 people (66,32%).

Table 1. Sample characteristics and families

Characteristic	n	%
Father's Age		
≥ 35 years	101	26,17
< 35 years	285	73,83
Mother's Age		
20-35 years	247	63,99
< 20 years	3	0,78
> 35 years	136	35,23
Age of Toddler		
24 -35 years	33	8,55
36 -47 years	162	41,97
48 - 59 years	191	49,98
Number of Children		
≤ 2 Children	256	66,32
> 2 Children	130	33,68
Child Spacing		
> 2 Children	241	62,22
≤ 2 Children	145	37,56
Gender		
Female	176	45,60
Male	210	54,40

The results showed that from 386 samples of children under five, 38,86% of toddlers suffered from stunting (z-score HFA <-2SD). The

results of the analysis of the independent variables of 11 PIS-PK indicators and the nutritional status of children under five (Table 2) were obtained using only family planning, as much as 47,67%; the percentage of mothers who use health facilities as a place to give birth is only 6,74%. Likewise, only a small percentage of toddlers get complete basic immunization (15,80%) and exclusive breastfeeding (17,62%). Almost most toddlers are monitored for growth and development regularly (83,68%). Some of the families under five experienced hypertension as much as 1,81% and 50,00% smoking. Families under five who have National Health Insurance have as much as 89,38%, and most families (88,34%) already use clean water sources and latrines (82,90%).

Table 2. Nutritional status and determinants of factors

Nutritional Status and Determinants of Factors	n	%
Nutritional Status (HFA)		
Normal	236	61,14
Stunting	150	38,86
Immunization		
Yes	61	15,80
No	7	1,81
No Answer	318	82,38
Exclusive Breastfeeding		
Yes	68	17,62
No	46	11,92
No Answer	272	70,47
Growth and Development Monitoring		
Yes	323	83,68
No	43	11,14
No Answer	20	5,18
Use of Contraceptives		
Yes	184	47,67
No	71	18,39
No Answer	131	33,94
Health Insurance Ownership		
Yes	345	10,62
No	41	10,62
Smoke		
Yes	193	50,0
No	193	50,0
Hypertension		
No	375	97,15
Yes	7	1,81
No Answer	4	1,04

Using Clean Water		
Yes	341	88,34
No	45	11,66
Using Latrines		
Yes	320	82,90
No	66	17,10
Childbirth at Health Facilities		
Yes	26	6,74
No	2	0,52
No Answer	358	92,75

Bivariate Analysis

The results of the study (Table 3) found that stunted toddlers were higher in toddlers whose mothers did not use birth control (50,70%) compared to mothers who used birth control (41,85%), and there was no answer (28,24%). The results of statistical tests showed no association between not using family planning and stunting in toddlers (OR = 1,42; 95% CI: 0,82–2,48; p = 0,203). The results of statistical tests showed that there was no relationship between the use of family planning and stunting in toddlers (OR = 0,54; 95%CI: 0,34–0,88; p = 0,014).

Stunted toddlers were higher in toddlers whose mothers did not give birth in health facilities (50,00%) compared to mothers who gave birth in health facilities (23,08%), and there was no answer (39,94%). The results of statistical tests showed no association between non-delivery in health facilities and stunting in toddlers (OR = 3,33; 95% CI: 0,18–61,69; p = 0,419). The results of statistical tests showed no association between no answers to childbirth in health facilities and stunting in toddlers (OR = 2,22; 95% CI: 0,87–5,66; p = 0,096).

Stunted toddlers were higher in toddlers who were not fully immunized (42,86%) compared to fully immunized toddlers (37,70%). The results of statistical tests showed no association between complete basic immunization and stunting in toddlers (OR = 1,24; 95%CI: 0,26–6,04; p = 0,791). The results of statistical tests showed no association of no answers to complete basic immunization with stunting in toddlers (OR = 1,06; 95%CI: 0,60–1,86; p = 0,850).

Stunted toddlers were higher in toddlers who were not exclusively breastfed (52,17%) compared to toddlers who were exclusively breastfed (27,94%), and there was no answer

(39,34%). The results of statistical tests showed that there was a relationship between exclusive breastfeeding and stunting in toddlers (OR = 2,81; 95% CI: 1,28–6,16; $p = 0,010$). Toddlers who do not get exclusive breastfeeding are 2,81 times more likely to be stunted compared to toddlers who get exclusive breastfeeding. The results of statistical tests also showed no association between no exclusive breastfeeding answers and stunting in toddlers (OR = 1,67; 95% CI: 0,93–2,99; $p = 0,084$).

Stunted toddlers were higher in toddlers who did not monitor growth and development (44,19%) compared to toddlers who monitored growth and development (38,08%), and there was no answer (40,00%). The results of statistical tests showed no association between not monitoring growth and development and stunting in toddlers (OR = 1,29; 95% CI: 0,68–2,45; $p = 0,441$). The results of statistical tests also showed no relationship between no growth and development monitoring data and stunting in toddlers (OR = 1,08; 95% CI: 0,43–2,73; $p = 0,864$).

Stunted toddlers are higher in toddlers whose hypertension data has no answer (50,00%) compared to toddlers whose families have hypertension (38,93%) and their families have hypertension (28,57%). The results of statistical tests showed no family relationship between hypertension and stunting in toddlers (OR = 0,63; 95% CI: 0,12–3,28; $p = 0,580$). The results of statistical tests also showed no association between no data on hypertension

and stunting in toddlers (OR = 1,57; 95%CI: 0,22–11,26; $p = 0,654$).

Stunted toddlers were higher in toddlers whose families smoked (44,56%) compared to toddlers whose families did not smoke (33,16%). The results of statistical tests showed that there was a family relationship between smoking and stunting in toddlers (OR = 1,62; 95% CI: 1,07–2,45; $p = 0,022$). Toddlers whose families smoke are 62% more likely to be stunted than toddlers whose families do not smoke.

Stunted toddlers are higher in toddlers who have health insurance (39,42%) compared to toddlers who do not have health insurance (39,42%). The results of statistical tests showed no association between having health insurance and stunting in toddlers (OR = 0,79; 95% CI: 0,40–1,57; $p = 0,513$). Stunted toddlers are higher in toddlers who do not use clean water (48,89%) compared to toddlers who use clean water (37,54%). The results of statistical tests showed no association between not using clean water and stunting in toddlers (OR = 1,59; 95% CI: 0,85–2,97; $p = 0,144$). Stunted toddlers are higher in toddlers who do not use latrines (50,00%) compared to toddlers who use latrines (36,56%). The results of statistical tests showed a relationship between not using latrines and stunting in toddlers (OR = 1,73; 95% CI: 1,01–2,95; $p = 0,043$). Toddlers who do not use latrines are 1,73 times more likely to be stunted compared to toddlers who use latrines.

Table 3. Factors influencing the prevalence of stunting among children under five in West Aceh

Variable	Stunting				OR (95% CI)	p-value
	Normal		Stunting			
	n	%	n	%		
Use of KB						
Yes	107	58,15	77	41,85		
No	35	49,30	36	50,70	1,42 (0,82 – 2,48)	0,203
No Answer	94	71,76	37	28,24	0,54 (0,34 – 0,88)	0,014
Childbirth at Health Facilities						
Yes	20	76,92	6	23,08		
No	1	50,00	1	50,00	3,33 (0,18 – 61,69)	0,419
No Answer	215	60,06	143	39,94	2,22 (0,87 – 5,66)	0,096
Immunization						
Yes	38	62,30	23	37,70		
No	4	57,14	3	42,86	1,24 (0,26 – 6,04)	0,791
No Answer	194	61,01	124	38,99	1,06 (0,60 – 1,86)	0,850
Exclusive breastfeeding						
Yes	49	72,06	19	27,94		

Variable	Stunting				OR (95% CI)	p-value
	Normal		Stunting			
	n	%	n	%		
No	22	47,83	24	52,17	2,81 (1,28 - 6,16)	0,010
No Answer	165	60,66	107	39,34	1,67 (0,93 - 2,99)	0,084
Growth and Development Monitoring						
Yes	200	61,92	123	38,08		
No	24	55,81	19	44,19	1,29 (0,68 - 2,45)	0,441
No Answer	12	60,00	8	40,00	1,08 (0,43 - 2,73)	0,864
Hypertension						
No	229	61,07	146	38,93		
Yes	5	71,43	2	28,57	0,63 (0,12 - 3,28)	0,580
No Answer	2	50,00	2	50,00	1,57 (0,22 - 11,26)	0,654
Smoke						
No	129	66,84	64	33,16		
Yes	107	55,44	86	44,56	1,62 (1,07 - 2,45)	0,022
Health Insurance						
Yes	209	60,58	136	39,42		
No	27	65,85	14	34,15	0,79 (0,40 - 1,57)	0,513
Using Clean Water						
Yes	213	62,46	128	37,54		
No	23	51,11	22	48,89	1,59 (0,85 - 2,97)	0,144
Using Latrines						
Yes	203	63,44	117	36,56		
No	33	50,00	33	50,00	1,73 (1,01 - 2,95)	0,043

*p<0,05, CI= Confidance Interval, OR= Odds Ratio

Multivariate Analysis

Multivariate analysis is performed to determine the independent variable that is most dominantly related to the dependent variable. The results of the study (Table 4) showed that the most dominant factor associated with stunting in toddlers was exclusive breastfeeding, with a value of OR = 2,93, which means that toddlers who did not get exclusive breastfeeding had a 2,93 times higher chance of stunting compared to toddlers who received exclusive breastfeeding.

Table 4. Multivariate analysis of determinants of stunting factors (P<0,05)

Variable	AOR	95% CI	p-value
Use of KB			
No	1,47	0,84 - 2,57	0,172
No Answer	0,53	0,32 - 0,87	0,013
Exclusive Breastfeeding			
Not Exclusive	2,93	1,32 - 6,50	0,008
Did not answer	1,84	1,02 - 3,34	0,043

*p<0,05, CI= Confidance Interval, AOR= Adjusted Odds Ratio

The results showed that the most dominant factor associated with stunting was exclusive breastfeeding. Toddlers who do not get exclusive breastfeeding are 2,93 times more likely to be stunted compared to toddlers who get exclusive breastfeeding. This research is in line with research (Halim et al., 2021; Apriluana, & Fikawati, 2018), which shows that the dominant factor that influences the incidence of stunting in toddlers is exclusive breastfeeding. This study is not in line with the research of Supriyanto et al. (2018), which shows the results of multivariate analysis that exclusive breastfeeding is not significant with stunting in toddlers aged 6–23 months in Indonesia.

The first two years of a child's life, otherwise known as the first 1000 days, are a critical period for growth and development. At this time, babies must get adequate and proper nutritional intake so that they do not suffer from malnutrition that can lead to stunting. Exclusive breastfeeding is the easiest way to meet the nutritional needs of babies. The benefits of exclusive breastfeeding have been proven to help children get adequate nutritional intake so

as to minimize the risk of stunting in children (Kang et al., 2018; Taha et al., 2018; Hadi et al., 2021). Breast milk is a nutritional intake that is in accordance with the needs of children and will help their growth and development. Babies who do not get enough milk mean that they have poor nutritional intake and can cause malnutrition (Sánchez et al., 2021).

In addition, researchers assume, based on the results of observations in the field, that the first West Aceh region is one of the districts that still holds the tradition and culture of *Peucicap* in children aged 40 days. In that culture, infants who are still 40 years old are introduced to the taste of various types of food, ranging from sugar, honey, fruits, meat, and so on, so that it will certainly decide efforts to breastfeed exclusively to children. Another possible reason why exclusive breastfeeding is the most determinant factor is due to the mother's lack of understanding of exclusive breastfeeding. Mothers who are busy working outside do not allow themselves to exclusively breastfeed their children. In addition, researchers also assume a lack of family understanding about the importance of exclusively breastfeeding children, which indirectly makes families not necessarily want to support mothers to exclusively breastfeed children.

Conclusion

The results of the study showed a relationship between exclusive breastfeeding, families who smoke, and the use of latrines and the incidence of stunting in West Aceh Regency. There is no relationship between family planning users, childbirth in health facilities, complete basic immunization of toddlers, monitoring of toddler growth and development, having health insurance, and the use of clean water. The results showed that the most dominant factor influencing stunting was a history of exclusive breastfeeding.

Efforts need to be made to increase the coverage of stunting prevention indicators on variables that are still low in coverage, such as exclusive breastfeeding, the use of family planning, childbirth in health facilities, the use of clean water, smoking, and the use of healthy latrines, through improving services in each field. The West Aceh district government needs

to increase the coverage of exclusive breastfeeding through increased education, breastfeeding counseling, and community empowerment.

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