International Journal of Public Health Science (IJPHS)
Vol. 14, No. 3, September 2025, pp. 1441~1451
ISSN: 2252-8806, DOI: 10.11591/ijphs.v14i3.25738

Stunting among toddlers in poor Indonesian households

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Article Info

Article history:

Received Aug 17, 2024
Revised Jan16, 2025
Accepted Mar 6, 2025

Keywords:

Indonesian
Infant
Poor households
Stunting
Toddlers

ABSTRACT

Poverty has a significant impact on stunting in children under the age of five from low-income families, accounting for around 18.4% of stunting cases in Indonesia. The goal of this study was to look into the factors that may contribute to the prevalence of stunting among children under the age of five from low-income families in Indonesia. The study used a cross-sectional design and data from the 2022 Indonesian National Nutrition Status Survey to evaluate approximately 112,574 children. The data was analyzed at the multivariate level in binary logistics using SPSS 26 software. The data revealed that around 24.8% of disadvantaged households in Indonesia experienced stunting, with a variety of variables impacting its frequency. These included residence variables (AOR:1.08 and 95% CI:1.08-1.09), maternal age (AOR: 1.28 with 95% CI: 1.21-1.25), education level (AOR: 1.02 and 95% CI: 1.01-1.03), marital status (AOR:1.02 with 95% CI: 1.01-1.03), Antenatal Care (ANC) (AOR:1.45 with 95% CI: 1.44-1.47), age of the child (AOR:3.29 with 95% CI: 3.27-3.31), and the sex of the infant (AOR:3.29 with 95% CI: 3.27-3.21). Seven characteristics have been identified as predictors of stunting in children under the age of five in disadvantaged Indonesian homes. Expanding targeted programs for low-income families is critical for increasing their income through comprehensive entrepreneurship training and social assistance activities.

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1. INTRODUCTION

Malnutrition, especially stunting, is often high in children from low-income families, especially in developing countries [1]. One of the influential factors is poverty [2], [3]. More than 25% of Indonesian infants under five years old who live in poor and isolated families suffer from stunting [4]. Children from low-income homes are approximately 2.4 times more likely to be stunted than children from wealthy ones [5]. This highlights the close link between poverty and the risk of stunting in children under five, which is undoubtedly amplified by the influence of poor household characteristics such as slum living, the mother's low educational status, the number of members in the household, or the influence of certain ethnicities [6]. Children from low-income families tend to have minimal access to healthy food and drinks and have low opportunities to enjoy and consume nutritious food [7], [8].

The global prevalence of stunting has decreased by about 10.7% over the past 22 years [9]. Although significant progress has been made worldwide, the eradication of childhood stunting continues to

be a challenge, particularly in Southeast Asian countries. From 2000 (37.2%) to 2022 (26.4%) in the South East Asian Region (SEAR), the prevalence of stunting has decreased by approximately 10.8% [9]. This also impacts the World Health Organization (WHO) region and several WHO member countries, including Indonesia. Indonesia will reduce stunting by 31.0% by 2022, making it the country with the biggest percentage reduction compared to Thailand and Malaysia, with a percentage reduction in stunting for the two countries of 11.8% and 21.9%, respectively [9]. The Ministry of Health of the Republic of Indonesia's stunting report from 2019 (27.27%) to 2022 (21.6%) shows a decrease in the prevalence of stunting in Indonesia of roughly 5.6% [10]. This is a breath of fresh air for the Indonesian government. However, the prevalence of stunting in 2022 is still below the Indonesian government's target in 2024 of 14%, for which there is a need for comprehensive and sustainable efforts and the need for a sustainable funding push on community-based interventions.

An accurate assessment of the impact of stunting must still be conducted in Indonesia, given that the prevalence in Indonesia is still below the prescribed level, as well as the many factors that cause stunting. For this reason, continuous evaluation is needed to develop interventions and ensure the improvement of the country's welfare in the long term [11]. A multi-regional study by Ekholuenetale *et al.* indicated that stunted children had approximately 7% less delayed cognitive development than non-stunted children [12]. These findings remind us of the necessity of timely treatments to reduce the devastating impact of stunting. Impaired early growth and development can pave the way for chronic diseases, academic problems, and reduced productivity in the workplace in later life [13], [14].

Stunting has devastating long-term implications for individuals and entire countries. Not only does stunting impair cognitive performance and increase the risk of mortality in children, but it also severely affects labor output and impedes economic progress [13], [15]. Not to mention that stunting produces sales losses in the private sector, which accrue between 0.01% and 1.2% of national gross domestic product (GDP) in all nations, especially in countries in the Latin American, Caribbean, East Asia, and Pacific regions, which experience the most significant losses [16]. Meanwhile, past research indicates the financial losses caused by stunting in Indonesia. Stunting cost the country 0.04-0.16% of GDP in 2013, translating to a difference between IDR 3,057 billion and IDR 13,758 billion. This estimate underscores the magnitude of the financial loss caused by stunting, representing wasted development investments and opportunities [17]. An earlier study painted an even bleaker picture, compounding these concerns. They estimate that by 2021, the economic loss due to stunting in Indonesia will increase to between 0.89% and 3.99% of its GDP. This worrying rise emphasizes the crucial need for effective interventions to solve the issue and unlock the full potential of the Indonesian workforce. More worrying than the macroeconomic picture is the personal impact of stunting. Adults stunted as children have 20% lower earning potential than their non-stunted peers. This gap underscores the long-term effect of stunting, which impedes individuals' economic mobility and contributes to income inequality in society [18].

Child stunting is more than just hunger; it is a complex problem caused by multiple causes across multiple sectors [18]. The WHO Stunting Framework and the Conceptual Framework on the Determinants of Maternal and Child Nutrition are examples of frameworks [19] that illustrate this complex reality. According to the research, malnutrition at an early age, recurrent diseases, inadequate sanitation, and socioeconomic inequalities are the leading causes of stunting. Children with insufficient diets are twice as likely to be stunted than those with nutritious diets [20]. Children who have a poor diet are three times more likely to be stunted than children who eat well [21]. Mothers with a primary education are 1.5 times more likely to give birth to a stunted kid than mothers with a college/university education [22]. Dietary habits, newborn weight, history of infection, and infant gender are risk factors for stunting, while parental wealth and education level are covariates [23]. This study examines the incidence of stunting, which is more prevalent among poor households in Indonesia. This study is more focused on looking at factors that correlate significantly with stunting among poor households in Indonesia. The benefits of this research are expected to become input and consideration for the government to expand programs focused on low-income families in Indonesia to improve people's lives and reduce the factors that cause stunting that occur in Indonesia. This study focuses on the factors that contribute to stunting in children under five in low-income homes in Indonesia.

2. METHOD

This study used secondary data from the Indonesian Nutrition Status Survey (SSGI) 2022, obtained from the Ministry of Health's National Development Policy Agency (BKPK), with a cross-sectional research study. The study population consisted of infants under the age of five years (toddlers) or under the age of 59 months from low-income homes, with mothers of toddlers participating as survey respondents. The weighted sample for this study was 112,574, chosen using the stratified random sampling technique. This research

included around 91.4% of all Indonesians. In SSGI 2022, wealth quintiles are determined by the ownership of household items in terms of quantity and variety. To ascertain the wealth status of householders, the study also used various objects, including televisions, bicycles, and vehicles, in addition to their properties. The construction material of the main floor, toilet facilities, and drinking water source were also considered in the evaluation. The poll used principal component analysis to calculate scores. The survey used household scores for each household member to construct national wealth quintiles, then divided them into five equal groups representing 20% of the population. The study classified the wealth status groups as Quintile 1 if the poorest 20% of the population (poorest); Quintile 2 if the poor and vulnerable 20% of the population (poorer); Quintile 3 if the moderate spending 20% of the population (middle); Quintile 4, if the upper middle spending 20% of the population (richer), and Quintile 5 if the wealthiest 20% of the population (most affluent). In this study, we classify households in quintiles 1 and 2 as poor households.

Stunting is the dependent variable in this study, as evidenced by the findings of a comparison of age and height throughout time. We investigated nine independent characteristics: child age, gender, early initiation of breastfeeding (EIBF), antenatal care (ANC), marital status, employment status, mother's age, education level, and type of residence. The survey divided residences into two categories: urban and rural. We used Indonesian statistical data to determine the division of urban and rural areas. First, a Chi-square test was conducted. This study used the linearity test to determine the significance of the association between independent variables, followed by a binary logistic test with SPSS 26 software. We also created a map of the distribution of stunted children from low-income families by province in Indonesia using ArcGIS 10.3. Statistics Indonesia donated a shapefile that includes administrative boundary polygons for this investigation. The National Ethics Commission's "notification letter" indicates that the 2022 Indonesian Nutrition Status Survey is an "exempt". The Indonesian Ministry of Health used a signed notification letter to gather data for the 2022 Indonesia National Nutrition Status Survey. Participants signed a consent document to highlighting the data collection was voluntary and that the private Indonesian Ministry of Health shared the following information with academics via the internet: https://layanandata.kemkes.go.id/.

3. RESULTS AND DISCUSSION

3.1. Results

These statistics suggest that 24.8% of the children under five in low-income homes are stunted. Figure 1 depicts the distribution of stunting among impoverished families in Indonesia. As illustrated in Figure 1, stunting appears to be more prevalent in eastern Indonesia.

Table 1 provides a descriptive statistical summary of the nutritional status of toddlers in low-income Indonesian households. According to Table 1, stunting in toddlers is more prevalent in rural areas than in metropolitan areas. Stunting in toddlers is also greatly affected by maternal age, with women over 45 years of age having a higher prevalence. Mothers with low levels of education are more likely to produce stunted children, as are divorced or widowed mothers. Children of unemployed mothers are stunted at a rate of roughly 24.8%. Stunting is more likely in children under the age of five among moms who did not receive ANC treatment, by about 28.6%, than in mothers who had ANC services during pregnancy. Meanwhile, the ratio of stunted children was highest at 24-35 months of age. In contrast, boys are more prone than girls to be stunted. Furthermore, children lacking EIBF have a larger proportion of stunted children compared to those with EIBF.

The correlation test findings for the questions in Table 1 show that the independent variables are not collinear, with an average significant tolerance of more than 0.10 and a variance inflation value of less than 10.00. The study found no significant relationship between two or more independent variables in the regression model using the multicollinearity test as a decision-making tool. According to Table 2, children under five living in rural regions are 1.088 times more likely to be stunted than those living in cities (AOR 1.088; 95% CI: 1.084-1.092). Children under five years old, regardless of their mother's age, were more likely to be stunted than those aged 45 years and above. The higher the mother's education level, the lower the risk of having a stunted toddler. In terms of maternal marital status, married mothers were 1.027 times more likely to have a stunted child compared to divorced or widowed mothers (AOR: 1.027; 95% CI: 1.015-1.039). In addition, mothers who did not perform ANC during pregnancy were 1.458 times more likely to have a stunted child compared to mothers who did (AOR: 1.458; 95% CI: 1.442-1.474). Based on the age of toddlers, all toddlers were more likely to be stunted than those aged 0-11 months. In addition, boys had a 3.295-fold higher risk of stunting than girls based on the gender of the toddler (AOR: 3.295; 95% CI: 3.273-3.317).

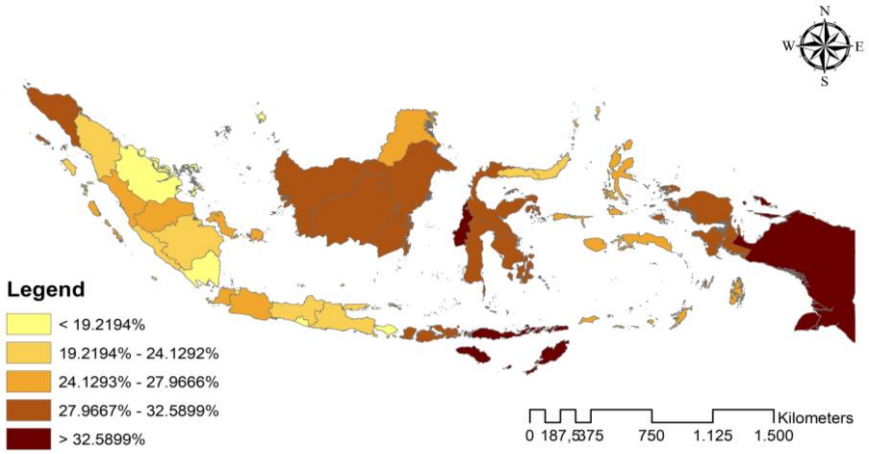

Figure 1. Distribution map of stunted toddlers by district/city in Papua Region, Indonesia

Table 1. Descriptive statistics on the nutritional status of toddlers under five in poor households in Indonesia (N = 112,574)

Variables		Nutrition status		p-value
		Normal (n = 83,792)	Dwarf (*n* = 28,782)	
Type of residence	Urban	76.6%	23.4%	*<0.001
	Rural	74.2%	25.8%	
Mother's age (in years)	≤ 19	76.4%	23.6%	*<0.001
	20-24	75.2%	24.8%	
	25-29	75.6%	24.4%	
	30-34	75.8%	24.2%	
	35-39	75.2%	24.8%	
	40-44	73.5%	26.5%	
	≥45	73.3%	26.7%	
Mother's education	Elementary school	71.9%	28.1%	*<0.001
	Junior high school	75.5%	24.5%	
	High school	78.3%	21.7%	
	Higher education	79.7%	20.3%	
Marital status of mother	Marry	75.3%	24.7%	*<0.001
	Divorced/widowed	74.6%	25.4%	
Mother's employment status	Unemployed	75.2%	24.8%	0.256
	Hired	75.3%	24.7%	
Do ANC during pregnancy	No.	71.4%	28.6%	*<0.001
	Yes.	81.5%	18.5%	
Toddler age (in months)	0-11	89.8%	10.2%	*<0.001
	12-23	73.0%	27.0%	
	24-35	68.7%	31.3%	
	36-47	71.6%	28.4%	
	48-59	74.1%	25.9%	
Gender of children under five	Boys.	74.0%	26.0%	*<0.001
	Girls	76.5%	23.5%	
Early breastfeeding initiation	No.	73.4%	26.6%	*<0.001
	Yes.	81.1%	18.9%	

*p-value < 0.001

3.2. Discussion

Stunting is a multifaceted and complex problem that often arises in poor households in Indonesia. This phenomenon can be attributed to these households' limited access to nutritious food. As a result, children from these households often experience prolonged malnutrition, which ultimately results in stunted growth [11]. According to the findings of this study, the prevalence of stunted children in Indonesian poor households is approximately 24.8%, which is higher than the national average for the same year (21.6%). In addition, the data show that children under five in rural areas are more likely to experience stunted growth than children under five in urban areas. Our findings suggest an increased probability of stunting among under-fives living in rural areas compared to urban areas. This observation aligns with findings from previous studies, including investigations conducted in South Sulawesi and West Sulawesi, which revealed that around 41.5% of stunting cases occurred in households classified as part of the poorest or very poor wealth

quintile [22]. Children in rural Rwanda are more likely to be stunted than those in cities. This disparity can be ascribed to numerous interconnected variables, including less access to excellent health services, restricted nutritional diversity, and fewer educational opportunities for parents in rural settings [24]. The lack of economic resources available to low-income families in rural areas results in restricted access to essential resources, such as nutritious food and adequate medical care, which are critical for child development [25].

Table 2. Nutritional status of toddlers under five years old among poor households in Indonesia: binary logistic regression (n = 112,574)

Predictor	Stunting			
	p-value	AOR	95% CI	
			Lower limit	Upper limit
Place of residence: urban (ref.)	-	-	-	-
Place of residence rural	*<0.001	1.088	1.084	1.092
Maternal age: ≤19 years	*<0.001	1.228	1.205	1.251
Mother's age: 20-24 years	*<0.001	1.109	1.096	1.123
Mother's age: 25-29 years	*<0.001	1.089	1.077	1.102
Mother's age: 30-34 years	*<0.001	1.031	1.020	1.043
Maternal age: 35-39 years	*<0.001	1.032	1.020	1.044
Mother's age: 40-44 years	*<0.001	1.049	1.036	1.062
Maternal age: ≥45 years (ref.)	-	-	-	-
Mother's education: elementary school	*<0.001	1.511	1.495	1.527
Mother's education: junior high school	*<0.001	1.251	1.238	1.265
Mother's education: high school	*<0.001	1.091	1.079	1.103
Mother's education: college (ref.)	-	-	-	-
Mother's marriage: married (ref.)	*<0.001	1.027	1.015	1.039
Maternal marriage: divorced/widowed	-	-	-	-
Having ANC during pregnancy: No	*< 0.001	1.458	1.442	1.474
Had ANC during pregnancy: Yes (ref.)	-	-	-	-
Age under five years old: 0-11 years (ref.)	-	-	-	-
Under five years old: 12-23 years	*<0.001	3.295	3.273	3.317
Under five years old: 24-35 years	*<0.001	2.879	2.844	2.914
Age under five: 36-47	*<0.001	2.499	2.468	2.529
Age under five years old: 48-59	*<0.001	2.192	2.165	2.220
Gender under two years old: male	*<0.001	3.295	3.273	3.317
Gender under two years old: female (ref.)	-	-	-	-
Early Breastfeeding initiation: No	0.965	1.000	0.994	1.006
Early Breastfeeding initiation: Yes	-	-	-	-

Notes: AOR: Adjusted Odds Ratio; CI: confidence interval; *$p < 0.001$.

Many significant variables contribute to Indonesia's high prevalence of stunting among children living in impoverished households. These factors include limited access to health services, inadequate drinking water quality, inadequate sanitation, and low parental education levels, as shown by comprehensive research results. A study conducted in Indonesia showed that the prevalence of stunting in rural areas reached 41.85%, while in urban areas it was only 30.58%. This difference implies that the availability of better infrastructure in urban areas may contribute to decreased stunting rates [26]. Children whose parents live in rural areas are more likely to be stunted than children who live in cities. This is due to the lack of a comprehensive healthcare system and difficulty accessing medical facilities [27]. Implementing effective measures to strengthen healthcare services and ensure food security in rural communities is a significant way to address the interconnected concerns of food insecurity and malnutrition among individuals in lower-middle-income rural areas [28]. According to Presidential Regulation Number 72 of 2021, stunting is a national health issue in Indonesia. This regulation requires the achievement of four indicators: The first goal is to improve the dedication and vision of leadership at all levels of government, from ministries and agencies to province governments and local governments to districts, cities, and villages. The second purpose is to improve communication on behavior change and community empowerment. The third goal is to enhance the coordination of particular and sensitive initiatives at all levels of government. The fourth purpose is to promote food security and nutrition at the household, individual, and community levels [29].

Mothers who give birth at an early or advanced age are more prone to have children with a high risk of stunted growth [25], [30]. Our results showed that children born to mothers aged 45 years or older at the time of delivery showed a lower probability of being stunted compared to children born to younger mothers. This phenomenon is thought to be due to the immaturity of physical and emotional abilities exhibited by young mothers [30]. The risk of stunting increases in mothers aged 19 years and older and gradually decreases as maternal age increases [31]. A study of empirical research from Indonesia suggests that children

of mothers who give birth in early adolescence or after the age of 35 have a higher risk of experiencing stunted growth and development compared to children born to moms in the ideal age range of 20-35 years [32], [33]. Studies conducted in Angola suggest that maternal age, alongside other factors, including economic status and parenting practices, is a significant contributor to the risk of stunting in children under the age of five [34]. Pregnancy at a young age often occurs without careful planning, which can result in a lack of appropriate and optimal prenatal care [32]. In contrast, older pregnancies are usually accompanied by health risks, such as hypertension or diabetes, which can affect fetal growth and increase the risk of child stunting [25]. This is supported by the results of a study conducted in Sambas, East Kalimantan, which indicated that the prevalence of stunting was higher in children of women with poor nutritional status or poor health conditions during pregnancy [32].

There is a correlation between mothers' education level and their propensity to engage with health services and facilities proactively. Mothers with greater levels of education are more likely to use various health services and interventions, such as antenatal checkups, vaccines, and nutritional advice [26]. Similarly, this study discovered that children under the age of five from moms with lower education levels were more likely to be stunted than children from mothers with higher education levels. Furthermore, Laksono *et al.* [35] research repeatedly revealed that children of mothers with lower education levels had a higher prevalence of stunting than children of mothers with higher education levels. Studies in lower-middle-income countries have found a strong link between maternal education and stunting rates. These findings indicate that highly educated moms are more likely to have comprehensive knowledge of nutrition, sanitation, and child health, which can successfully minimize the incidence of stunting [36]. Maternal knowledge can also indirectly influence other factors, such as family income, access to health services, and understanding of appropriate feeding practices, which can affect the incidence of stunting [37]. The results of studies conducted in rural areas show that community-based education programs designed to target rural mothers proved to be an effective method to reduce stunting. This was attributed to the program participants' improved nutrition knowledge and parenting practices [38]. Mothers with greater levels of education are more likely to engage in comparative decision-making on health service consumption, including traditional and alternative techniques, to enhance health outcomes among children under five [6].

A mother's marital status can impact her ability to secure and utilize the social, economic, and material resources needed to provide appropriate meals for her children [39]. In Indonesia, married mothers are more likely to engage in exclusive breastfeeding (EBF) compared to divorced or widowed mothers, which could be attributed to the influence of the father as a source of motivation and support for the mother, as well as the provision of spousal support during the first 1,000 days, pregnancy, and post EBF period. Research in Sub-Saharan Africa has indicated that children of unmarried and divorced moms are disproportionately affected by stunting due to the absence of social and economic support that is more available to those who are married. In addition, studies conducted in South Asia consistently show that children of married mothers have more optimal nutritional outcomes and significantly lower incidences of stunting than those of unmarried mothers due to economic stability and better access to support [39]. Studies conducted across South Asia consistently show that children of married mothers exhibit better nutritional outcomes, including reduced incidence of stunting, compared to children of unmarried mothers [40]. Evidence suggests that married mothers demonstrate more economic stability and social support than unmarried mothers. Yet, single women frequently face high financial stress, which may impair their ability to provide optimal diets for their children.

Stunting is caused by chronic malnutrition and many contributing variables throughout the first 1,000 days, from the mother's pregnancy to the child's second year of life [41]. Implementing maternal health monitoring and supplementation initiatives through antenatal care (ANC) activities is essential to reduce this phenomenon. Research findings suggest that pregnant women who do not undergo ANC are more likely to experience complications during pregnancy than those who do. A systematic analysis of research in Ethiopia revealed a significant reduction in the prevalence of stunting, estimated at roughly 6.8%, among women who consistently used health services for pregnancy-related care [42]. A study by Titaley *et al.* [41] showed a consistent correlation between the frequency of antenatal check-ups, with a minimum of four visits, and avoidance of stunted labor. Mothers who receive adequate ANC are less likely to have stunted children due to improved maternal health monitoring and nutritional interventions during pregnancy [43]. In addition, ANC emphasizes improving the nutritional profile of pregnant women, primarily through supplementation, which can reduce the likelihood of infant stunting [44]. Maternal and child health monitoring is a process that goes beyond prenatal check-ups to include postnatal care. This continuum of care can be attributed to adequate attendance during pregnancy for ANC, an important aspect of maternal and child health. Mothers who do not access ANC are less likely to have comprehensive knowledge about child care [41].

The younger a child is, the greater their susceptibility to stunting, which results from higher nutritional requirements and greater susceptibility to infectious diseases [18], [45]. It is commonly known

that children under two are more sensitive to stunting. This is an important era for growth and development; thus, proper nutrition is necessary. Previous research has repeatedly demonstrated that toddlers, regardless of their age, have a higher risk of stunting than infants aged 0-11 months [46]. The prevalence of stunting tends to increase with age up to two years, after which it tends to decrease [47]. Nutrition and health interventions are most effective for preventing stunting during toddlerhood. A recent meta-analysis revealed that such interventions, including nutritional supplementation and maternal education, are crucial in reducing the risk of stunting during this age [47].

Gender-specific factors influence the incidence of stunting. Research conducted in Ethiopia showed that boys' and girls' susceptibility to stunting is different [48]. Specifically, it was discovered that boys are more sensitive to stunting than girls. When it comes to children under the age of five, boys are more likely to be stunted than girls, according to research. Boys are believed to be more sensitive to many illnesses, including infections, which can impair normal growth and development. In addition, epidemiological evidence suggests that boys tend to experience more significant morbidity due to inherent biological differences between the sexes [41]. A literature study from South Asia found that in some countries, girls are at higher risk of stunting than boys. This difference is due to the cultural preference to allocate family resources to boys [37]. A meta-analysis of sub-Saharan research indicated significant variance among nations in the prevalence of stunted growth among boys and girls. A synthesis of the findings suggests that the underlying causes of this variation include disparities in access to health and education services, which in turn result from gender inequality [49]. A parallel study conducted in South Asia revealed that girls are more prone to stunting than boys. This phenomenon is due to a combination of cultural norms that favor boys' and girls' limited access to adequate nutritional resources [50]. In most cases, boys are more vulnerable to the adverse effects of stunting, a phenomenon shaped by a complex interaction between socioeconomic and cultural factors.

It is widely recognized that early initiation of breastfeeding (IMD) is an important determinant of successful exclusive breastfeeding and overall infant health [51]. Findings from our investigation showed that there was no clear association between IMD and the occurrence of stunting among pediatric patients. This conclusion differs slightly from earlier research studies that found that IMD may be connected with the development of stunting in children under the age of five [52]. A South Asian study found that IMD dramatically lowered the incidence of stunting among children in the region [53]. A reduced likelihood of stunting was observed in children who had received IMD. Other factors, such as maternal education and the availability of health care, also influenced the outcome [33]. Long-term factors may influence stunting, which could explain the disparity between this study's findings and those of other investigations. These factors include post-breastfeeding nutrient intake, unfavorable environmental conditions, maternal nutritional status during pregnancy, and recurrent infections in the child.

4. CONCLUSION

The findings revealed that there are seven variables associated with stunting in children under the age of five in poor households in Indonesia. The seven factors are child age, gender, marital status, education level, prenatal care, and type of residence. According to the report, strategies emphasizing older mothers and insufficient formal education should be prioritized in rural areas to eliminate stunting. Patients with ANC need constant supervision from medical specialists. For high-risk populations, empowerment programs that provide relevant life skills are essential. Empowerment programs can be done by working together across sectors and programs.

This study primarily relied on extensive data analysis to reach conclusions about low-income households in Indonesia. This inquiry employs the survey factors as an extra data source for this analysis. The findings of this study ignore some important aspects that have been examined in other studies. Height, weight, anemia, diarrhea, and agricultural yields during maternal pregnancy have been associated with stunting in children. However, the quantitative techniques of this study did not include other common cultural characteristics in Indonesia. Many other studies have influenced related conclusions, including the importance of the child, foods to avoid, parenting, and eating habits.

ACKNOWLEDGMENTS

The authors thank the Ministry of Health of the Republic of Indonesia for providing the data for the Indonesia National Nutrition Status Survey 2022.

FUNDING INFORMATION

Authors state no funding involved.

AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

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C : **C**onceptualization
M : **M**ethodology
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D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

CONFLICT OF INTEREST STATEMENT

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

ETHICAL APPROVAL

The Faculty of Public Health Ethics Committee of Universitas Cenderawasih approved this study with the code 092/KEPK-FKMUC/2024.

DATA AVAILABILITY

Data availability is not applicable to this paper as no new data were created or analyzed in this study.

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