

Family-Related Factors Associated with Stunting

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ABSTRACT

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Stunting remains a significant nutritional concern for the Indonesian government due to its impact on human resource quality. The Puskesmas (Community Health Centre) in Duren Sawit Subdistrict has experienced an increase in the proportion of stunting cases, rising from 9.06% to 10.5% over the last three months. Objective: This study aims to identify family factors associated with stunting in children aged 12-59 months in the Puskesmas of Duren Sawit Subdistrict for 2023. This research adopts a case-control study design with 41 cases and 41 controls. Cases were identified based on a compilation of data on stunted children at the health center, while controls were children without a stunting diagnosis. Sampling was conducted using the simple random sampling method. Data collection involved direct interviews with the mothers of the children and a review of medical documents. Data analysis was performed using the Chi-square test. Family income with less than minimum wage has the highest PR value compared to other variables, namely 9.68 (95% CI 2.48- 37.78), so it can be concluded that family income with less than minimum wage is the variable that most influences stunting. The recommendation in this study is that cooperation between the Duren Sawit Subdistrict Health Center and the local government, involving community leaders and an interactive approach, is necessary to provide education on nutrition and family financial management for the effectiveness of stunting prevention.



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INTRODUCTION

Stunting remains a critical nutritional issue in Indonesia, significantly impacting the quality of its human resources (Ministry of Villages and Development of Disadvantaged Regions, 2017). It results from prolonged inadequate dietary intake, often due to inappropriate food offerings relative to nutritional needs. Stunting can begin in utero and manifest in children up to two years old. The World Health Organization (WHO) defines stunting as a condition where a child's height or length is below the WHO growth standards, characterized by a height or length for age more than two standard deviations below the median of the WHO child growth standards (World Health Organization, 2014). In alignment with this, the Indonesian Ministry of Health adopted WHO's child growth standards in its Regulation No. 2 of 2020, using length-for-age or height-for-age indices to categorize stunting ($-3SD$ to $\leq -2SD$). Addressing stunting is imperative due to its association with hindered brain development, reduced learning quality, decreased adult productivity, and increased risk of non-communicable diseases (obesity, hypertension, diabetes mellitus, etc.) (Ministry of Health Republic Indonesia, 2016).

Globally, stunting remains a concern, especially in developing countries. WHO's 2021 report estimates that 22.0% of children under five worldwide were stunted in 2020, with Southeast Asia having a prevalence of 27.4% (World Health Organization, 2021). Indonesia witnessed a national decrease in stunting rates, from 27.7% in 2019 to 24.4% in 2021 and further to 21.6% in 2022. Despite some regions achieving rates below 20%, these figures still need to catch up to the National Medium-Term Development Plan (RPJMN) 2024 goal of 14%. Achieving this target does not signify the eradication of stunting in Indonesia but rather a

transition to the next goal of reducing stunting to a low category of below 2.5%. The most significant reductions in stunting rates have been observed in West Java, East Java, Central Java, North Sumatra, and Banten (National Development Planning Agency, 2020)

According to West et al. (2018), factors leading to stunting are direct and indirect. Direct factors include infectious diseases, exclusive breastfeeding, low birth weight, dietary patterns, maternal knowledge, and household and family environment. Indirect factors encompass community and social elements such as economic status, healthcare services, education, social and cultural factors, and food security.

In the DKI Jakarta Province, the 2022 Nutritional Status Study for Children (SSGI) reported a stunting prevalence of 14.8% (Ministry of Health Republic Indonesia, 2021). The government has undertaken various stunting prevention efforts through specific and sensitive nutritional interventions. These interventions, focusing on the First 1,000 Days of Life, include supplemental feeding for pregnant women, addressing deficiencies in iron, folic acid, and iodine, protecting mothers from malaria, promoting early initiation of breastfeeding, exclusive breastfeeding, and introducing complementary feeding after six months. These efforts are anticipated to significantly contribute to the reduction of stunting cases (National Population and Family Planning Board, 2017).

The Duren Sawit Subdistrict Health Centre in East Jakarta, a primary public healthcare facility, has been at the forefront of stunting management. Data from the Child Weight Monitoring Month (BPB) between October-December 2022 and January-March 2023 indicated increased stunting cases from 9.06% to 10.5%. Interviews with community health workers suggest a link between high stunting rates and families living in poverty, poor dietary patterns in young children, and limited maternal knowledge. Despite the implementation of the Nutrition Post for Zero Stunting program, stunting cases continue to rise. Therefore, research into family-related factors associated with stunting in children aged 12-59 months at the Duren Sawit Subdistrict Health Centre in 2023 is particularly relevant, given the lack of previous studies in this context. Despite implementing various interventions and programs to address stunting, including the Nutrition Post for Zero Stunting program, stunting cases continue to rise in the Duren Sawit Subdistrict Health Centre in East Jakarta. Therefore, there is a need to investigate the family-related factors associated with stunting in children aged 12-59 months in this specific context. This research aims to understand the family-related factors contributing to the high prevalence of stunting cases among children aged 12-59 months at the Duren Sawit Subdistrict Health Centre in 2023.

METHOD

This study employed a case-control design (1:1) with a total of 82 samples, comprising 41 cases (children with stunting) and 41 controls (children without stunting) in the jurisdiction of the Duren Sawit Subdistrict Health Centre. Cases were identified based on a compilation of stunting data in the health center, while controls were children without a stunting diagnosis. The sampling method used is Simple Random Sampling. The process begins by determining a list of names of children aged 12-59 months who are registered in the working area of the Community Health Center (Puskesmas) of Duren Sawit District in 2023. Out of the total 82 stunted children, 41 stunted children and 41 mothers with non-stunted children are randomly selected from the total number of mothers visiting the health center, which is 2681. Subsequently, interviews and questionnaire administrations are conducted door-to-door with the selected 82 samples. Bivariate analysis using chi-square and multivariate analysis using logistic regression were conducted. Stunting was the dependent variable, while the independent variables included mother's education level (low: elementary, junior high, senior high/vocational school, and increased if college), mother's knowledge about stunting (poor knowledge if the answer score < median value of 5.00 and good knowledge if the answer score \geq median value of 5.00), mother's occupation, family income (low income if monthly income <Rp. 4,900,000 according to the minimum wage in Bekasi city), mother's age, exclusive breastfeeding history, family support (poor support if mean answer score <11.5 and good support if mean answer score \geq 11.5), and attendance at integrated health posts (rarely attends if not regular every month and often

follows if regularly attends every month). This research has passed ethical review with the number 0923-08.133/DPKE-KEP/FINAL-EA/UEU/VII/2023.

RESULTS

Table 1. Characteristics of mothers

Category	n	%
Maternal knowledge about stunting		
Poor	34	41.5
Good	48	58.5
Maternal education		
Low	21	25.6
High	61	74.4
Maternal occupation		
Working	13	15.9
Not Working	69	84.1
Maternal age		
<20 years	7	8.5
≥20 years	75	91.5
Family income		
<Minimum Wage	59	72.0
≥Minimum Wage	23	28.0
Family support		
Insufficient	56	68.3
Good	26	31.7
History of exclusive breastfeeding		
Did not give exclusive breastfeeding	18	22.0
Gave exclusive breastfeeding	64	78.0
Visit the integrated health centre		
Rare	17	20.7
Frequent	65	79.3

Table 1 illustrates that a majority of mothers possess substantial knowledge about stunting, have a higher education, are non-working, are aged 20 years or older, come from families with low income, receive minimal family support, practice exclusive breastfeeding, and frequently visit integrated healthcare center (Posyandu).

Table 2. Types of family support

Family Support	n	%
Family advises on child development	4	4.9
Remind to monitor development regularly	5	6.1
Give praise when there is progress	11	13.4
Support health worker recommendation	8	9.8
Help with the cost of the child's check-up	17	20.7
Consume animal protein in food	5	6.1
Have special time to monitor child development	6	7.3
Total	56	100

Table 2 presents data on the support provided by families in child development. Among the 56 mothers who received family support, the most significant proportion of family support is observed in "Help with the cost of child's check-up" (20.7%). Meanwhile, the most minor proportion of family support is in "Family advice on child development" (4.9%).

Table 3. Cross-tabulation for independent variables and stunting

Category	Case		Control		OR (95% CI)	p-value
	n	%	n	%		
Maternal knowledge about stunting						
Poor	22	53.7	12	29.3	2.79 (1.12-6.95)	0.04
Good	19	46.3	29	70.7		
Maternal education						
Low	14	34.1	7	17.1	2.51 (0.89-7.11)	0.12
High	27	65.9	34	82.9		
Maternal occupation						
Working	6	14.6	7	17.1	0.83 (0.25-2.73)	1.00
Not working	35	85.4	34	82.9		
Maternal age						
< 20 years	3	7.3	4	9.8	0.73 (0.15-3.48)	1.00
≥ 20 years	38	92.7	37	90.2		
Family income						
< Minimum wage	37	90.2	22	53.7	7.98 (2.48-26.53)	0.01
≥ Minimum wage	4	9.8	19	46.3		
History of Exclusive Breastfeeding						
Did not give exclusive breastfeeding	11	26.8	7	17.1	1.78 (0.61-5.17)	0.42
Gave exclusive breastfeeding	30	73.2	34	82.9		
Visit the integrated health centre						
Rare	9	22.0	8	19.5	1.60 (0.39-3.38)	1.00
Frequent	32	78.0	33	80.5		
Family support						
Insufficient	35	85.4	21	51.2	5.55 (1.92-16.04)	0.02
Good	6	14.6	20	48.8		

Table 4. Determinants factors of stunting

Variables	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Family income with less than minimum wage	2.216	0.695	10.170	1	0.001	9.167	2.349	35.778
Insufficient family support	1.191	0.602	3.913	1	0.048	3.292	1.011	10.718
Poor maternal knowledge about stunting	1.413	0.607	5.425	1	0.020	4.109	1.251	13.496
Low maternal education	0.695	0.634	1.202	1	0.273	2.004	0.578	6.944

The logistic regression test showed that the most influential factors of stunting in Duren Sawit subdistrict health care are family income with less than minimum wage, insufficient family support, and poor maternal knowledge about stunting. Family income with less than minimum wage has the highest PR value compared to other variables, namely 9.68 (95% CI 2.48- 37.78), so it can be concluded that family income with less than minimum wage is the variable that most influences stunting. Family incomes with less than minimum wage are 9.68 times less likely to get stunted than respondents with more than minimum wage.

DISCUSSION

Family income

The results of this study demonstrate a significant relationship between family income and stunting. This finding is consistent with research conducted by Nugroho (2016), which found a significant association between family income and stunting in children aged 1 to 3 years (Study in the Tanjungkarang Barat Subdistrict of Bandar Lampung City) with a p-value of 0.019 (p<0.05). This is because low family economic status can influence the quality and quantity of food consumed by the family. Typically, the food obtained is less varied and in smaller amounts,

especially in food items essential for children's growth, such as protein sources, vitamins, and minerals, thus increasing the risk of malnutrition.

This aligns with the theory proposed by Chilinda et al. (2021), which states that a family's economic status affects the family's ability to meet nutritional needs and access healthcare services. Children from families with low economic status are at higher risk of stunting because their lower ability to meet dietary needs increases the risk of malnutrition. Children from economically disadvantaged families consume less food than better-off families, resulting in lower energy and nutrient intake. Studies on nutritional status have shown that children from economically disadvantaged families have lower weight and height compared to children from economically better-off families (Rahayu et al., 2018).

Based on discussions with the Nutrition Program staff at the Duren Sawit Subdistrict Health Center, many wives solely rely on their husbands' income from daily casual labor. Due to the low and unstable family income, wives prioritize other needs over providing nutritious food for their children. Consequently, many mothers only give whatever food is available to their children without considering the essential nutritional needs for their growth and development. It is recommended that the Subdistrict Health Center collaborates with the local government to provide skills training or financial assistance to mothers to increase family income. Furthermore, regular education for mothers on the importance of nutrition in child growth and economical ways of cooking nutritious food should be conducted. Additionally, expanding nutritional assistance programs for low-income families or providing easier access to affordable markets or nutritious food stalls is essential. Moreover, the Subdistrict Health Center should organize financial management training for families so that mothers can allocate income more wisely for the nutritional needs of their families.

Maternal knowledge about stunting

The results of this study demonstrate a significant relationship between maternal knowledge and stunting. This is supported by Rusliani et al. (2022) study, which found a significant association between maternal knowledge of nutrition and the occurrence of stunting in Teruman Hamlet with a p-value of 0.000 ($p < 0.05$). Similarly, research by Sutriyawan & Nadhira (2020) indicated that maternal knowledge was significantly associated with stunting among toddlers in the working area of the Citarip Primary Health Care Unit in Bandung City in 2019, with a p-value of 0.006 ($p < 0.05$).

Knowledge is crucial as cognitive understanding is vital in shaping an individual's behavior. Behavior rooted in knowledge and awareness tends to be more enduring than behavior lacking such foundations. With adequate nutrition knowledge, particularly regarding stunted toddlers, it becomes easier to influence maternal behavior in monitoring the growth and development of toddlers or maintaining the mother's health. Mothers play a significant role in promoting the growth and development of their toddlers through appropriate stimulation, parenting practices, and ensuring a balanced nutritional intake for their toddlers (Mulyaningsih et al., 2021).

Poor parenting practices, including maternal lack of knowledge about health and nutrition before, during, and after pregnancy, are among the factors contributing to child stunting (Tafesse et al., 2021). Maternal knowledge of stunting also influences the occurrence of stunting in toddlers through their caregiving practices. Mothers who understand the dangers of stunting are more likely to take preventive measures to protect their children from stunting. Maternal understanding of stunting affects household management, influencing a mother's food selection for her family (Belayneh et al., 2021).

The results of discussions with the Nutrition Program staff at the Duren Sawit Community Health Center indicate that the low maternal knowledge about stunting may be due to inadequate access to information about stunting and its impact on child growth. The Duren Sawit Community Health Center has implemented a Nutrition Post program, which is one of the efforts to empower families to address nutrition issues in the community. The program is community-based, aiming to maintain and improve the nutritional status of toddlers. However, its implementation has yet to be optimal due to the low participation of mothers in the counseling sessions. Additionally, the health center needs more support from community

leaders, religious figures, and social organizations in disseminating information about stunting. Given these findings, the researcher recommends that the Duren Sawit Community Health Center involve community leaders, religious figures, and social organizations in disseminating information about stunting. They can serve as agents of change in raising community awareness about the dangers of stunting.

Family support

This research indicates a significant relationship between family support and the occurrence of stunting. This finding aligns with Aguayo and Menon's 2016 study, which mentions that family support in good feeding practices and understanding of nutrition can significantly impact the prevention of stunting in toddlers across various regions, including South Asia (Aguayo & Menon, 2016). Family support is not just related to material aspects but also understanding and practices that support optimal child growth. Family support can include providing nutritious food, monitoring toddler growth, and understanding good nutritional practices. Collaborative family efforts can reduce the risk of stunting in toddlers (Alderman & Headey, 2017). Presents data on the support provided by families in child development. Among the 56 mothers who received family support, the most significant proportion of family support is observed in "Help with the cost of child's check-up" (20.7%). Meanwhile, the most minor proportion of family support is in "Family advice on child development" (4.9%). The minor proportion of family support in "Family advising on child development" may stem from various factors, including limited awareness about the significance of providing such guidance, low levels of education within the family, cultural priorities that may not emphasize child development advice, economic constraints prioritizing basic needs, and potential communication barriers hindering practical discussions (Soekatri et al., 2020).

Based on the discussion with the head of cadres in the working area of Puskesmas Duren Sawit, the lack of family support in child growth and development is caused by the insufficient knowledge of family members about this information. In addition, economic pressure also directs the family's primary focus on meeting basic needs. The Duren Sawit Community Health Center has been conducting regular education on family support in child development, typically during Posyandu. However, the challenge lies in the ineffective delivery of information on stunting, primarily using simple repetitive posters each month, leading to boredom. Moreover, the lack of two-way interaction during education sessions can reduce effectiveness. It is recommended that the health center adopt a more innovative and interactive approach, utilizing various communication media such as short videos and leaflets and organizing more interactive education sessions involving mothers in discussions and Q&A sessions. Involving community and religious leaders can also help create solid social support. Utilizing storytelling or real-life case-based approaches and conducting education sessions in small groups can further enhance maternal engagement and strengthen understanding of stunting, thus improving prevention efforts' effectiveness.

CONCLUSION

This study showed that the most influential factors of stunting in Duren Sawit subdistrict health care are family income with less than minimum wage, insufficient family support, and poor maternal knowledge about stunting. There is a need for innovative and interactive counseling approaches, including using various communication media, counseling sessions involving mothers, story-based approaches, and small group sessions, to increase the effectiveness of stunting prevention.

AUTHOR'S DECLARATION

Authors' contributions and responsibilities

NWS: Writing original draft (lead), conceptualization, visualization, funding acquisition; **ss:** writing original draft (supporting), funding acquisition; **DAK:** Supervision (lead), validation (equal), visualization (equal), funding acquisition (equal), review and editing; **SS:** Writing original draft, formal analysis, conceptualization; **MDRR:** Supervision (lead), validation (equal), visualization (equal).

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Availability of data and materials

All data generated or analyzed during this study are available from the corresponding author upon reasonable request.

Competing interests

The authors declare no competing interest.

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