



THE IMPACT OF SWEETENED CONDENSED MILK CONSUMPTION ON THE NUTRITIONAL STATUS AND HEALTH OF TODDLERS

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ABSTRACT

Stunting remains a public health problem in Indonesia with a national prevalence of 19.8% in 2024. One factor that can influence the nutritional status of toddlers is food consumption patterns, including the use of sweetened condensed milk, which is often misinterpreted as nutritious milk by the public, even though its nutritional content is low and dominated by added sugar. The purpose of this study was to describe the incidence of stunting in toddlers and analyze the characteristics of mothers and toddlers and the use of sweetened condensed milk in the household that influence the incidence of stunting in toddlers. This study used a cross-sectional design with a sample of 100 pairs of mothers and toddlers obtained through a simple random sampling technique. Data on the characteristics of mothers and toddlers and the use of sweetened condensed milk were collected through a structured questionnaire, while the nutritional status of toddlers was determined using the height-for-age indicator. Prior to use, the questionnaire was tested for validity and reliability in another Bogor area with similar characteristics, involving 20 mothers of toddlers, and yielded a Cronbach's alpha of 0.920. Data analysis was performed using the chi-square test. The results showed the prevalence of stunting in toddlers was 41.0% (very short 20.0% and short 21.0%). Father's occupation was the only factor associated with the incidence of stunting in toddlers ($p = 0.015$). The prevalence of stunting found exceeds the national figure, so it is necessary to expand stunting prevention programs by taking into account employment factors and family socio-economic conditions, as well as public education about the dangers of using sweetened condensed milk on toddlers.

Keywords: father's occupation; stunting; sweetened condensed milk; toddler

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INTRODUCTION

Stunting is a chronic nutritional problem that remains a serious challenge to health development in Indonesia. Globally, the WHO reports that approximately 23.2%, or 150.2 billion children under five, will experience stunting by 2024 (United Nations Children's Fund (UNICEF), World Health Organization, & International Bank for Reconstruction and Development/The World Bank, 2025). In Indonesia, the prevalence of stunting reached 19.8% in 2024. Although this figure is already below the threshold set by the WHO as an indicator of public health problems, it is crucial to continue reducing this figure. Stunting not only impacts children's physical growth but is also related to cognitive development, endurance, and productivity in adulthood (Alam et al., 2020; Mustakim, Irwanto, Irawan, Irmawati, & Setyo-boedi, 2022; Widayanti, Bety Agustina Rahayu, & Sutono, 2024). Previous research shows that stunted children experience a 7.0% decrease in optimal cognitive development compared to non-stunted children (Ekholuenetale, Barrow, Ekholuenetale, & Tudeme, 2020).

Research shows that Indonesia is projected to have a large young population by 2045. This situation demands a nutritional development program that can serve as a crucial foundation for developing a healthy, productive, and competitive generation. As a strategic step, the Prabowo Subianto

administration launched a free nutritious meal program aimed at students from early childhood education (PAUD) to high school, as well as pregnant women, breastfeeding mothers, and toddlers. This program is expected to support the development of superior human resources (HR) by optimally meeting the community's nutritional needs. This is because food and nutritional quality are key factors in developing healthy and competitive human resources (Abbas, 2025).

However, many challenges remain in the field. One of these is toddler food consumption patterns (Lee et al., 2022; Wicaksono et al., 2021). There are still many misunderstandings in the community regarding the provision of nutritious food and drinks, one of which is the use of sweetened condensed milk. Sweetened condensed milk is often considered a milk substitute, even though its nutritional content is low and dominated by added sugars that are not suitable for children's nutritional needs (Marlindayanti & Maris, 2024). Based on home visits conducted by YAIKI in collaboration with PP Aisyiyah from 2019 to 2024, it was found that many parents still provide sweetened condensed milk as a milk drink for their toddlers (Tim Percepatan Penurunan Stunting, 2023). This is despite the government, through the Food and Drug Authority (BPOM), having issued Regulation No. 21 of 2021 and conducting outreach regarding the dangers of giving sweetened condensed milk to toddlers, which can lead to obesity, organ damage, malnutrition, and other health problems. This is proven by field findings, where children who consume sweetened condensed milk experience malnutrition, undernutrition, and growth and development delays such as not being able to walk at the age of 2 years, experiencing skin problems (scabs), diarrhea, and tooth decay (Marlindayanti & Maris, 2024; Sahal, 2023).

Statistics Indonesia (BPS) data from 2024 shows that the average consumption of sweetened condensed milk in Indonesia is approximately 0.061 cans of 397 grams per capita per week, or the equivalent of approximately 24 grams per person per week (Badan Pusat Statistik Indonesia, 2024). This figure indicates that sweetened condensed milk consumption remains quite high in the community, potentially impacting the nutritional quality of families, including toddlers. The Head of the Indonesian Food and Drug Monitoring Agency (BPOM RI), Penny K. Lukito, stated that other dairy products, including sweetened condensed milk, are not categorized as breast milk substitutes. Businesses must also adhere to this regulation when promoting their products in accordance with applicable regulations. "Sweetened condensed milk should not be given to infants under 12 months of age (BPOM RI, 2021).

In addition to consumption factors, the characteristics of the mother and toddler also play a significant role in determining their nutritional status. Parental education level, employment status, family income, maternal age, toddler health, and sanitation are known to influence the incidence of stunting (Astuti, Paek, Meemon, & Marohabutr, 2024; Azriani et al., 2024; Chui, Osero, & Mugo, 2024). This study aims to describe the incidence of stunting in toddlers in Pamijahan District and analyze the characteristics of mothers and toddlers and the use of sweetened condensed milk in households that influence the incidence of stunting in toddlers in the district.

METHOD

A cross-sectional study was conducted in four villages in Pamijahan District, Bogor Regency, from February to April 2025. The population of this study was all mothers and toddlers in Pamijahan District, with samples from four villages (Cibitung Wetan, Cibitung Kulon, Ciasihan, and Cibunian). The sample selection criteria included inclusion criteria: mother-toddler pairs (infants aged 0-59 months), infants and mothers free from serious/chronic illnesses such as cancer, HIV/AIDS, mental disorders/disabilities, and the ability to communicate well in answering questions during interviews. Exclusion criteria included mothers and toddlers undergoing intensive care at health facilities (hospitals/clinics, etc.) for conditions such as typhoid, dengue fever, and other illnesses. The sampling technique used simple random sampling, resulting in a sample size of 100 toddlers who consumed sweetened condensed milk as a growth milk drink.

Data collection was conducted using a structured questionnaire, and information gathering was conducted through in-depth interviews with mothers of toddlers and stakeholders, including health officials, community leaders, and direct observation in the community. To ensure the quality of the instrument, a validity test was carried out in another location within the Bogor area with similar characteristics involving 20 mothers of toddlers, resulting in a Cronbach's alpha value of 0.920, which indicates excellent reliability. Data analysis with bivariate chi-square to determine the relationship between mother-toddler characteristics and the use of sweetened condensed milk in the household with stunting in toddlers. This research has obtained ethical approval from the Research Ethics Commission of the Faculty of Medicine and Health, Universitas Muhammadiyah Jakarta with number 83/PE/KE/FKK-UMJ/V/2024.

RESULT

The study, which involved 100 mothers and toddlers, showed that the prevalence of stunting in this study was 41.0% (very short 20.0% and short 21.0%), with most toddlers being in the normal height category for their age at 58.0% (Table 1).

Table 1.
Nutritional Status based on Height/Age in Toddlers

Stunting status	n	%
Severely stunted	20	20.0
Stunted	21	21.0
Normal	58	58.0
Tall	1	1.0

The characteristics of mothers and toddlers and the use of sweetened condensed milk in the household are shown in Table 2. The characteristics of mothers show that the majority of mothers are aged 26-35 years 59.0%, with multiparity parity 69.0%, graduated from high school / MA 40.0%, not working / housewives 87.0%, have family income below the minimum wage 52.0%, husband / father of toddlers graduated from high school / MA 46.0%, and work as civil servants 55.0%. The characteristics of toddlers show that the majority of toddlers are male 56.0%, only 1 toddler is under 24 months old, 91.0% have a birth weight above 2500 grams, most toddlers are given complete immunizations 59.0%, have suffered from infectious diseases 65.0%, do EIB 76.0%, give complementary feeding at the age of 6 months and above 92.0% and do regular weight monitoring 86.0%.

The use of sweetened condensed milk among toddlers remains high, with many introduced from 8 months of age and above, primarily in sachet form due to its affordability and practicality. Frequent consumption is reported, and significant health impacts such as dental caries, diarrhea, and itching are common. Most mothers still perceive sweetened condensed milk as regular milk, largely influenced by information from the media, although nearly half have also learned through the media that it is not recommended for young children.

Table 2.
Respondent Characteristics

Variable	f	%
A. Maternal Characteristics		
Mother's Age		
< 25 years	8	8.0
26-35 years	59	59.0
> 35 years	33	33.0
Parity		
Primipara	28	28.0
Multipara	69	69.0
Grande multipara	3	3.0
Mother's Education		
Did not complete primary school	9	9.0

Variable	f	%
Completed primary school	20	20.0
Completed junior high school	30	30.0
Completed senior high school	40	40.0
Completed diploma (D1/D2/D3)	1	1.0
Mother's Occupation		
Not working/housewife	87	87.0
Private employee	2	2.0
Entrepreneur	2	2.0
Civil servant (PNS)	2	2.0
Laborer	7	7.0
Family Income		
< PMW 2025	52	52.0
≥ PMW 2025	48	48.0
Father's Education		
Did not complete primary school	6	6.0
Completed primary school	22	22.0
Completed junior high school	24	24.0
Completed senior high school	46	46.0
Completed diploma (D1/D2/D3)	2	2.0
Father's Occupation		
Not working	1	1.0
Private employee	7	7.0
Entrepreneur	25	25.0
Civil servant (PNS)	55	55.0
Laborer	12	12.0
B. Child's Characteristics		
Gender		
Boys	56	56.0
Girls	44	44.0
Child's Age		
< 24 months	1	1.0
≥ 24 months	99	99.0
Low Birth Weight (LBW)		
< 2500 grams	9	9.0
≥ 2500 grams	91	91.0
Immunization History		
Yes, complete	59	59.0
Incomplete	41	41.0
History of Infectious Diseases		
Yes, has occurred	65	65.0
Never occurred	35	35.0
Early Initiation of Breastfeeding (EIB)		
Yes, EIB	76	76.0
No, not EIB	24	24.0
Complementary Feeding		
< 6 months	8	8.0
≥ 6 months	92	92.0
Weight monitoring		
Yes	86	86.0
No	14	14.0
C. Sweetened Condensed Milk use in Households		
Consumption of sweetened condensed milk in toddlers		
6-8 months	5	5.0
≥ 8 months	95	95.0
Purchase sweetened condensed form		
Sachet	45	45.0

Variable	f	%
Can	34	34.0
Pouch	21	21.0
Giving sweetened condensed milk in a day		
1 time	37	37.0
2 time	36	36.0
3 time	18	18.0
More than 3 times	9	9.0
The reason why mothers choose condensed milk		
Affordable and convenient	73	73.0
Available at shops and nearby	17	17.0
My child doesn't like powdered milk	2	2.0
My child likes condensed milk	5	5.0
My child is a fussy eater	1	1.0
Others	2	2.0
Sweetened Condensed Impact		
No	17	17.0
Yes	83	83.0
Dental Health		
No	40	40.0
Caries/cavities	60	60.0
Diarhea		
No	56	56.0
Yes	44	44.0
Skin Health		
No	90	90.0
Itching	10	10.0
Sweetened Condensed Milk is		
Milk	64	64.0
Water with milk flavor (not milk)	12	12.0
Sugar-based drink with added milk	24	24.0
Where did you get this information?		
Media	79	79.0
Non Media	21	21.0
Form of Information/Promise Obtained Regarding Sweetened Condensed Milk		
Oral	40	40.0
Written	60	60.0
Information that Sweetened Condensed Milk should not be given to babies/children		
Media	45	45.0
Non Media	55	55.0

Table 3 shows the relationship between maternal and toddler characteristics and the use of sweetened condensed milk with stunting. Mothers under 35 years of age had more stunted children (44.8%) compared to mothers aged 35 years and over (33.3%). However, there was no significant relationship between maternal age and stunting in toddlers ($p=0.380$). Mothers with low education had more stunted children (47.5%) compared to mothers with high education (31.7%), and there was no significant relationship between maternal education and stunting in toddlers ($p=0.171$). Fathers with low education had more stunted children (44.2%) compared to fathers with high education (37.5%), and there was no significant relationship between paternal education and stunting in toddlers ($p=0.631$). Working mothers had more stunted children (53.8%) compared to unemployed mothers or housewives (39.1%). However, there was no significant relationship between maternal occupation and stunting in toddlers ($p=0.479$). Fathers who work as civil servants have fewer stunted children (26.7%) compared to fathers who work as other than civil servants (52.7%). This shows that father's occupation is significantly associated with stunting in toddlers (p -value = 0.015, OR = 0.326, 95% CI = 0.140-0.760). Family income < PMW has more stunted children (48.1%) compared to family income $\geq$ PMW (33.3%). However, there is no significant relationship between family income and stunting in toddlers ($p = 0.196$). Primiparous mothers have

slightly more stunted children (42.9%) compared to multiparous mothers (40.3%). This shows that there is no significant relationship between parity and stunting in toddlers ($p = 0.993$).

In toddler characteristics, the proportion of stunting in male toddlers (41.1%) was not much different from female toddlers (40.9%), so there was no significant relationship between gender and stunting in toddlers ($p = 1.000$). The proportion of stunting in toddlers with BBL < 2500 grams was higher (55.6%) than toddlers with BBL $\geq$ 2500 grams (39.6%), but there was no significant relationship with stunting ($p = 0.565$). The proportion of stunting in toddlers with a history of complete immunization (39.0%) was lower than those with incomplete (43.9%), but there was no significant relationship between immunization history and stunting ($p = 0.775$). Toddlers with a history of infectious diseases were more stunted (44.6%) compared to those without a history of infectious diseases (34.3%), but there was no significant relationship between a history of infectious diseases and stunting ($p = 0.430$). Toddlers who did not follow EIB were more likely to experience stunting (45.8%) compared to toddlers who followed EIB (39.5%), but there was no significant relationship between EIB and stunting ($p=0.753$). Toddlers who were given complementary feeding for <6 months were less likely to experience stunting (37.5%) compared to those who were given complementary feeding for $\geq$ 6 months (41.3%), indicating there was no significant relationship between the age of complementary feeding and stunting ($p=1.000$). Toddlers who did not monitor their weight were more likely to experience stunting (50.0%) compared to those who monitored their weight regularly (39.5%), but there was no significant relationship between weight monitoring and stunting ($p=0.656$).

The use of sweetened condensed milk showed that there was no difference in the proportion of stunted toddlers in the purchase of sweetened condensed milk in sachets (40.0%) and cans or pouches (41.8%), there was no significant relationship between the purchase of sweetened condensed milk and stunting ($p = 1.000$). The proportion of stunted toddlers was higher in toddlers who were given sweetened condensed milk 1-2 times a day (42.5%) compared to $\geq$ 3 times a day (37.0%), there was no significant relationship between giving sweetened condensed milk and stunting ($p = 0.794$). The proportion of stunted toddlers was higher in mothers who stated that sweetened condensed milk was not milk (47.2%) compared to mothers who stated that sweetened condensed milk was milk (37.5%), there was no significant relationship between mothers' knowledge of sweetened condensed milk and stunting ($p = 0.461$). The proportion of stunted toddlers was higher in toddlers whose health was affected by sweetened condensed milk consumption (43.4%) compared to toddlers who were not affected (29.4%), but there was no significant relationship between the impact of sweetened condensed milk on health and stunting ($p = 0.426$). The reason mothers give sweetened condensed milk to toddlers because it is cheap and practical is lower in having stunted children (39.7%) compared to other reasons (44.4%), but there is no significant relationship between the reasons mothers give sweetened condensed milk and stunting ($p=0.844$).

Table 3.

The Relationship between Mother-Toddler Characteristics and the Use of Sweetened Condensed Milk with Stunting

Variable	Stunting		Normal		p-value	OR (CI 95%)
	f	%	f	%		
A. Maternal Characteristics						
Mother's Age					0.380	1.622(0.680-3.868)
<35 years	30	44.8	37	55.2		
≥35 years	11	33.3	22	66.7		
Mother's Education					0.171	1.945(0.846-4.475)
Low	28	47.5	31	52.5		
High	13	31.7	28	68.3		
Father's Education					0.631	1.322(0.594-2.944)
Low	23	44.2	29	55.8		
High	18	37.5	30	62.5		

Variable	Stunting		Normal		p-value	OR (CI 95%)
	f	%	f	%		
Mother's Occupation					0.479	0.550(0.170-1.776)
Housewife	34	39.1	53	60.9		
Working	7	53.8	6	46.2		
Father's Occupation					0.015	0.326(0.140-0.760)
Civil servant (PNS)	12	26.7	33	73.3		
Non Civil servant (PNS)	29	52.7	26	47.3		
Family Income					0.196	1.852(824-4.163)
< PMW (Rp. 2.191.238)	25	48.1	27	51.9		
≥ PMW	16	33.3	32	66.7		
Parity					0.993	1.112(0.459-2.693)
Primipara	12	42.9	16	57.1		
Multipara	29	40.3	43	59.7		
B. Child's Characteristics						
Gender					1.000	1.007(0.451-2.247)
Boys	23	41.1	33	58.9		
Girls	18	40.9	26	59.1		
Low Birth Weight (LBW)					0.565	1.910(0.480-7.593)
< 2500 grams	5	55.6	4	44.4		
≥ 2500 grams	36	39.6	55	60.4		
Immunization History					0.775	0.816(0.364-1.833)
Yes, complete	23	39.0	36	61.0		
Incomplete	18	43.9	23	56.1		
History of Infectious Diseases					0.430	1.544(0.658-3.620)
Yes, has occurred	29	44.6	36	55.4		
Never occurred	12	34.3	23	65.7		
Early Initiation of Breastfeeding (EIB)					0.753	0.771(0.306-1.944)
Yes, EIB	30	39.5	46	60.5		
No, not EIB	11	45.8	13	54.2		
Complementary Feeding					1.000	0.853(0.192-3.784)
< 6 months	3	37.5	5	62.5		
≥ 6 months	38	41.3	54	58.7		
Weight monitoring					0.656	0.654(0.211-2.031)
Yes	34	39.5	52	60.5		
No	7	50.0	7	50.0		
C. Sweetened Condensed Milk use in Households						
Purchase sweetened condensed form					1.000	0.928(0.416-2.068)
Sachet	18	40.0	27	60.0		
Can/Pouch	23	41.8	32	58.2		
Giving sweetened condensed milk in a day					0.794	1.255(0.506-3.113)
1-2 time	31	42.5	42	57.5		
≥ 3 time	10	37.0	17	63.0		
Sweetened Condensed Milk is					0.461	0.671(0.293-1.534)
Milk	24	37.5	40	62.5		
Not Milk	17	47.2	19	52.8		
Sweetened Condensed Impact					0.426	0.544(0.176-1.684)
No	5	29.4	12	70.6		
Yes	36	43.4	47	56.6		
The reason why mothers choose condensed milk					0.844	0.824(0.338-2.011)
Affordable and convenient	29	39.7	44	60.3		
Others reason	12	44.4	15	55.6		

DISCUSSION

Research conducted in four villages in Pamijahan sub-district, Bogor Regency, obtained data on the prevalence of stunting in toddlers of 41.0%, still far above the national figure in 2024 of 19.8% and the stunting rate in West Java Province (15.9%), indicating that this region faces more severe nutritional challenges than the national and provincial averages (Kemenkes RI, 2025). Previous research in Bogor Regency showed the prevalence of stunting in toddlers of 30.5% in 2023 and 32.2% in 2024 (Permatasari, Chadirin, Ernirita, & Fauziah, 2025; Permatasari, Chadirin, Ernirita, Syafitri, & Fadhillah, 2025). This indicates that there is an increase in the prevalence of stunting in toddlers every year in Bogor Regency.

Based on maternal characteristics, stunting prevalence in toddlers was higher among mothers under 35 years of age, mothers and fathers with low levels of education, working mothers, and fathers with jobs other than civil service. Furthermore, stunting prevalence was also higher in families with incomes below the Provincial Minimum Wage (PMW) and among primiparous mothers. However, statistical tests showed that only fathers' occupations were associated with stunting in toddlers, while other factors did not show a significant association. This study aligns with previous studies that found paternal occupations were associated with stunting in toddlers (Rahman, Kiyu, & Seling, 2021; Rizky Maulidiana & Sutjiati, 2021). Previous research also showed that stunting in toddlers is more common among parents with low education, low family income, and families with more than four members (Gaiser, Winkler, Klug, Nkurunziza, & Stelzle, 2023; Wicaksono et al., 2021). Socioeconomics, parental education and occupation, family income, and household size are basic risk factors for stunting in toddlers (Azriani et al., 2024).

In terms of toddler characteristics, the proportion of stunting in toddlers was higher among toddlers with a birth weight of <2500 grams, a history of incomplete immunization, a history of infectious diseases, not starting early initiation of breastfeeding (EIB), being given complementary feeding for ≥ 6 months, and toddlers who did not regularly monitor their weight. Statistical test results showed that toddler characteristics did not show a significant relationship with the incidence of stunting in toddlers. These results are in line with previous research conducted in Jakarta where EIB and providing complementary feeding were not associated with stunting. However, in that study, low birth weight (LBW) and immunization history were associated with stunting (Permatasari, Djarir, Herlina, & Fauziah, 2023).

The use of sweetened condensed milk in households shows that the proportion of stunted toddlers is higher in toddlers who are given sweetened condensed milk 1–2 times a day, toddlers whose mothers state that sweetened condensed milk is not milk, toddlers who experience health impacts from consuming sweetened condensed milk, and mothers who give sweetened condensed milk to toddlers because it is available at the shop and close by, the child does not like powdered milk, the child likes sweetened condensed milk, the child has difficulty eating, and various other reasons. The results of statistical tests show that the use of sweetened condensed milk in households does not show a significant relationship with the incidence of stunting in toddlers. Previous research has shown that stunted children consume powdered formula milk or sweetened condensed milk 1–3 times a day. 80.0% of children who consume sweetened condensed milk have bad dental caries (Marlindayanti & Maris, 2024). People choose sweetened condensed milk because it is affordable, practical, tastes good, has attractive promotions and advertisements, and is easy to obtain (St. Aisyah R, Mustafa, Hippy, & Sari, 2023). Information from the Food and Drug Authority (BPOM) that sweetened condensed milk is not recommended as a single drink has not been optimally communicated to parents. Many businesses continue to spread misleading information about the benefits of sweetened condensed milk, especially for children, which contradicts BPOM regulations (Firmawan, Alfaris, Azis, & Resyia, 2024). Other research shows that mass media coverage has a positive and significant influence on mothers' perceptions of sweetened condensed milk (Chandra W. & Sudarmanti, 2021). Television advertisements, product packaging, and price simultaneously

significantly influence purchasing decisions for sweetened condensed milk (Rahmawati & Setya N, 2021).

CONCLUSION

The prevalence of stunting in toddlers is 41.0% in Pamijahan District, Bogor Regency, a figure that poses the local government's greatest nutritional challenge in accelerating stunting mitigation. Based on the characteristics of mothers and toddlers and the use of sweetened condensed milk in the household, fathers' occupations are the only factors associated with stunting in toddlers. There is a need to improve education for families, especially fathers as financially responsible, regarding the importance of providing balanced nutrition for toddlers and the dangers of consuming sweetened condensed milk as a milk substitute. Expanding stunting prevention programs is essential, taking into account family occupational factors and socio-economic conditions.

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