



Published By :
Surgical Residency Program
Universitas Syiah Kuala

Overview of the first 1000 days of life and stunting in toddlers 0-2 years old in Tegallalang District, Bali Province



Luh Gede Pradnyawati^{1*}, Dewa Ayu Putu Ratna Juwita¹,
Komang Triyani Kartinawati¹, Made Indra Wijaya¹,
Anak Agung Sagung Mirah Prabandari¹

ABSTRACT

Introduction: The most crucial time for a child's physical and cognitive development is the first 1000 days of life. Their nutritional state will influence toddlers' future health, intelligence, and productivity in the first 1000 days of life. The study aimed to describe the first 1000 days of life in toddlers aged 0-2 years.

Methods: This cross-sectional study used a household survey in 30 clusters. Five samples of children between 0-1 years old and five samples between the ages of 1-2 years old were selected by simple random sampling from each census block for 300 respondents. Nutrition adequacy was analyzed in Nutrisurvey 2007 program. All data were analyzed descriptively in the SPSS program.

Results: The prevalence of stunting in children aged 0-2 in Tegallalang District was 12%. Among children 0-1 years old was 8%, while in children aged 1-2 years was 17%. 41% of pregnant women and toddlers were exposed to secondhand smoke. The rate of exclusive breastfeeding was 44%, vitamin A supplementation was 43.7%, deworming treatment was 52%, and only 20% of people had clean water. There were 115 toddlers aged 1-2 years with deficits in carbohydrates, 140 toddlers with deficits deficiencies, and 80 toddlers with deficits in iron.

Conclusion: The problem of stunting in Tegallalang District still exists. Community health workers should encourage women and their male partners regarding second-hand smoke, exclusive breastfeeding, vitamin A supplementation, and deworming treatment. Access to clean water is also urgently required. Further study is needed to determine the modifiable risk factors for stunting.

Keywords: Stunting, the first 1000 days of life, toddlers, Tegallalang.

Cite This Article: Pradnyawati, L.G., Juwita, D.A.P.R., Kartinawati, K.T., Wijaya, M.I., Prabandari, A.A.S.M. 2023. Overview of the first 1000 days of life and stunting in toddlers 0-2 years old in Tegallalang District, Bali Province. *Journal of International Surgery and Clinical Medicine* 3(1): 11-15. DOI : 10.51559/jiscm.v3i1.41

¹Lecturer, Department of Community and Preventive Medicine, Faculty of Medicine and Health Sciences, Universitas Warmadewa.

*Corresponding to:
Luh Gede Pradnyawati;
Lecturer, Department of Community and Preventive Medicine Faculty of Medicine and Health Sciences, Universitas Warmadewa;
pradnyawati86@gmail.com

Received: 2022-10-26

Accepted: 2023-01-22

Published: 2023-02-28

INTRODUCTION

The first 1000 days of life are crucial as all the important organs and systems of the body begin to develop rapidly. This is a golden period where immune system maturation, optimal physical growth, and cognitive construction occur. However, 1000 days of life that is not optimal may result in stunting.¹ Stunting is a nutritional problem caused by an imbalance between food consumption and body needs that occur for a long time. Children are categorized as stunted or experiencing short/very short stature based on the index of body length or height for age with a Z-score of -3 SD to <-2 SD for the short (stunted) category and <-3 SD for the very short (severe stunted) category. The

number of children under 5 years old with stunting reached 154.8 million (22.9%) worldwide in 2016, where Asia occupied the highest position compared to other continents, namely 87 million, followed by Africa with 59 million and Latin America with 6 million.²

Indonesia is ranked the 3rd highest prevalence of stunting in Southeast Asia, with a prevalence of 36.4% in 2005-2017. National Health Research (Risksedas) data in 2018 showed that the prevalence of toddlers with stunted and stunted nutritional status reached 30.8%. (37.2%).³ This is a decrease of 6.4% compared to stunting in 2013 but has not yet met the National Medium-Term Development Plan (RPJMN) 2019 goal, which sets the prevalence of stunting at 28%. World

health organization (WHO) states that stunting prevalence should be under 20%. Bali Province is one of the provinces with a prevalence of stunting above the limit set by WHO, which is 24.9%. The ten highest stunting villages in Bali were located in Gianyar Regency, including Tegallalang district.⁴ The 2015-2017 Nutrition Status Monitoring (PSG) revealed that the prevalence of stunting in Gianyar Regency was 22.5%.⁵

Socio-economic conditions and environmental sanitation are closely related to the incidence of stunting. Families with low economic conditions may find it difficult to meet nutritional needs and gain access to health services for pregnant women and toddlers.⁶ Poor sanitation can increase the risk of

infectious diseases such as diarrhea and intestinal worms, which can affect the nutritional status of toddlers. Long-term worm infections can interfere with the absorption of nutrients in the digestive tract and, in the long term, may disrupt the physical growth of toddlers.⁷

Reducing the stunting rate by 40% in 2025 is one of the targets of the Sustainable Development Goals (SDGs). To achieve this, the government has established specific and sensitive nutrition intervention programs involving all relevant government sectors.⁸ Specific nutrition interventions contribute as much as 30% to reducing the prevalence of stunting. This intervention consists of providing supplementary feeding and iron plus folic acid supplement for pregnant women, implementation of integrated antenatal care, counseling of early initiation of breastfeeding (EIBF) and exclusive breastfeeding, monitoring of toddler growth, implementation of the School Children Nutrition program, counseling on clean and healthy living behavior (PHBS), and family planning (KB) for adolescents and adults. The sensitive nutrition intervention programs contributed as much as 70% to reducing the prevalence of stunting. The programs include providing access to clean water and sanitation, health services and family planning, fortification of Vitamins A and D in food, provision of National Health Insurance (JKN), early childhood care education, community nutrition education programs, and provision of assistance and social security for low-income families.⁹

METHODS

Study Design

This cross-sectional household survey was conducted in Tegallalang District, Gianyar Regency, Bali Province, Indonesia. We performed interviews with a structured questionnaire to obtain socio-demographic characteristics, the achievement levels of First 1000 Days of Life specific intervention (exposure of secondhand-smoke to pregnant women or toddlers, exclusive breastfeeding, vitamin A supplementation, deworming treatment, basic immunization), the achievement level of First 1000 Days of Life sensitive intervention (access to clean water, latrine

possession, waste management, and hand-washing in the family), and the frequency and type of infectious disease among toddler in the last 3 months. Nutrient intake adequacy was obtained via a 24-hour food recall questionnaire.

Sample selection procedure

This study was conducted in the population of families with children aged up to 24 months in Tegallalang District from January 2022-December 2022. The households that refused to participate or had incomplete questionnaires were excluded. The samples were selected using a cluster sampling method. Population data from the Central Bureau of Statistics (BPS) of Bali Province were used as the sampling frame. We selected 30 clusters using the probability proportional to size (PPS). Five samples of children between 0-1 years old and five samples between

the ages of 1-2 were selected with simple random sampling from each census block for 300 respondents.

Data Analysis

The collected data were analyzed descriptively and presented in the frequency distribution table. Nutrition adequacy was analyzed in Nutrisurvey 2007 program. Data were analyzed using Microsoft Excel for Windows and SPSS computer program version 21.

RESULTS

Characteristics of Sample

There is a total of 300 households included in this study. The sample characteristic is presented in Table 1. The number of females and males was equal. Most of the toddlers were born with Caesarean Section (63%) and had normal birth weight (96%)

Table 1. Characteristics of the Research Sample

Toddler (n=300)	N	%
Age		
0-1 year	150	50%
1-2 years	150	50%
Gender		
Male	150	50%
Female	150	50%
Birth Method		
Normal	112	37%
Cesarean Section	188	63%
Birth Weight		
Normal	288	96%
Low Birth Weight	12	4%

Table 2. Achievement Level of Specific Indicator in the First 1000 Days of Life

Indicator (n=300)	n (%)
Exposure of secondhand-smoke to pregnant women and toddlers	
Yes	124 (41.0)
No	176 (59.0)
Exclusive Breastfeeding	
Yes	132 (44.0)
No	168 (56.0)
Vitamin A supplementation	
Yes	131 (43.7)
No	169 (56.3)
Deworming treatment	
Yes	156 (52.0)
No	144 (48.0)
Basic immunization	
Yes	290 (96.7)
No	10 (3.3)

Table 3. Achievement Level of Sensitive Indicators in the First 1000 Days of Life

Indicator (n=300)	n (%)
Access to clean water (municipal waterworks /packaged water source)	
Yes	60 (20.0)
No	240 (80.0)
Possession of latrine	
Yes	296 (99.0)
No	4 (1.0)
Waste management	
Yes	273 (91.0)
No	27 (9.0)
Hand washing	
Yes	257 (86.0)
No	43 (14.0)

Table 4. Stunting Incidence

Group of children	Stunting	
	Stunted n (%)	Normal n (%)
Age		
0-1 years	12 (8%)	138 (92%)
>1-2 years	25 (17%)	125 (83%)
Gender		
Male	18 (12%)	132 (88%)
Female	20 (13%)	130 (87%)

Table 5. Frequency and Type of Infectious Disease among Toddlers in the last 3 months

Variable	n (%)
Frequency	
Never	186 (62)
<3 times	143 (48)
>3 times	17 (6)
Type	
Diarrhea	25 (8)
Pyrexia	183 (61)
Dyspnea	17 (6)
Cough and cold	47 (16)
Dermatitis	6 (2)

Implementation of the First 1000 Days of Life

The achievement level of specific intervention programs is shown in Table 2. Most specific intervention programs were not achieved as 41% of pregnant women and toddlers were exposed to secondhand smoke, only 44% of mothers practiced exclusive breastfeeding, only 43.7% of toddlers had vitamin A supplementation, and only 52.0% of toddlers had deworming treatment.

The achievement level of the sensitive

intervention program is shown in Table 3. Only 20% of households had access to clean water. There were 4 (1%) households that didn't have latrine, 27 (9%) households that didn't have proper wash management and 43 (14%) households that didn't practice hand-washing.

1-2 years with carbohydrates, 140 deficits in calcium, and 80 deficits in iron. The number of nutrient deficits is higher in toddlers aged 1-2 than in toddlers aged 0-1.

1-2 years with carbohydrates, 140 deficits in calcium, and 80 deficits in iron. The number of nutrient deficits is higher in toddlers aged 1-2 than in toddlers aged 0-1.

1-2 years with carbohydrates, 140 deficits in calcium, and 80 deficits in iron. The number of nutrient deficits is higher in toddlers aged 1-2 than in toddlers aged 0-1.

1-2 years with carbohydrates, 140 deficits in calcium, and 80 deficits in iron. The number of nutrient deficits is higher in toddlers aged 1-2 than in toddlers aged 0-1.

1-2 years with carbohydrates, 140 deficits in calcium, and 80 deficits in iron. The number of nutrient deficits is higher in toddlers aged 1-2 than in toddlers aged 0-1.

1-2 years with carbohydrates, 140 deficits in calcium, and 80 deficits in iron. The number of nutrient deficits is higher in toddlers aged 1-2 than in toddlers aged 0-1.

1-2 years with carbohydrates, 140 deficits in calcium, and 80 deficits in iron. The number of nutrient deficits is higher in toddlers aged 1-2 than in toddlers aged 0-1.

1-2 years with carbohydrates, 140 deficits in calcium, and 80 deficits in iron. The number of nutrient deficits is higher in toddlers aged 1-2 than in toddlers aged 0-1.

1-2 years with carbohydrates, 140 deficits in calcium, and 80 deficits in iron. The number of nutrient deficits is higher in toddlers aged 1-2 than in toddlers aged 0-1.

1-2 years with carbohydrates, 140 deficits in calcium, and 80 deficits in iron. The number of nutrient deficits is higher in toddlers aged 1-2 than in toddlers aged 0-1.

1-2 years with carbohydrates, 140 deficits in calcium, and 80 deficits in iron. The number of nutrient deficits is higher in toddlers aged 1-2 than in toddlers aged 0-1.

1-2 years with carbohydrates, 140 deficits in calcium, and 80 deficits in iron. The number of nutrient deficits is higher in toddlers aged 1-2 than in toddlers aged 0-1.

1-2 years with carbohydrates, 140 deficits in calcium, and 80 deficits in iron. The number of nutrient deficits is higher in toddlers aged 1-2 than in toddlers aged 0-1.

1-2 years with carbohydrates, 140 deficits in calcium, and 80 deficits in iron. The number of nutrient deficits is higher in toddlers aged 1-2 than in toddlers aged 0-1.

1-2 years with carbohydrates, 140 deficits in calcium, and 80 deficits in iron. The number of nutrient deficits is higher in toddlers aged 1-2 than in toddlers aged 0-1.

1-2 years with carbohydrates, 140 deficits in calcium, and 80 deficits in iron. The number of nutrient deficits is higher in toddlers aged 1-2 than in toddlers aged 0-1.

1-2 years with carbohydrates, 140 deficits in calcium, and 80 deficits in iron. The number of nutrient deficits is higher in toddlers aged 1-2 than in toddlers aged 0-1.

1-2 years with carbohydrates, 140 deficits in calcium, and 80 deficits in iron. The number of nutrient deficits is higher in toddlers aged 1-2 than in toddlers aged 0-1.

1-2 years with carbohydrates, 140 deficits in calcium, and 80 deficits in iron. The number of nutrient deficits is higher in toddlers aged 1-2 than in toddlers aged 0-1.

1-2 years with carbohydrates, 140 deficits in calcium, and 80 deficits in iron. The number of nutrient deficits is higher in toddlers aged 1-2 than in toddlers aged 0-1.

1-2 years with carbohydrates, 140 deficits in calcium, and 80 deficits in iron. The number of nutrient deficits is higher in toddlers aged 1-2 than in toddlers aged 0-1.

1-2 years with carbohydrates, 140 deficits in calcium, and 80 deficits in iron. The number of nutrient deficits is higher in toddlers aged 1-2 than in toddlers aged 0-1.

1-2 years with carbohydrates, 140 deficits in calcium, and 80 deficits in iron. The number of nutrient deficits is higher in toddlers aged 1-2 than in toddlers aged 0-1.

1-2 years with carbohydrates, 140 deficits in calcium, and 80 deficits in iron. The number of nutrient deficits is higher in toddlers aged 1-2 than in toddlers aged 0-1.

1-2 years with carbohydrates, 140 deficits in calcium, and 80 deficits in iron. The number of nutrient deficits is higher in toddlers aged 1-2 than in toddlers aged 0-1.

1-2 years with carbohydrates, 140 deficits in calcium, and 80 deficits in iron. The number of nutrient deficits is higher in toddlers aged 1-2 than in toddlers aged 0-1.

1-2 years with carbohydrates, 140 deficits in calcium, and 80 deficits in iron. The number of nutrient deficits is higher in toddlers aged 1-2 than in toddlers aged 0-1.

DISCUSSION

Stunting is a complex disease with multifactorial causes. Nutrition proved to be essential in the development of stunting. This study revealed that toddlers aged 1-2 years old had a higher prevalence of stunting than toddlers aged 0-1. Toddlers aged 0-1 years tend to get nutrition from their mother's breastmilk more often than toddlers aged 1-2 years, which causes their nutritional needs to be more fulfilled and possibly causes a lower prevalence of stunting. In addition, children aged 1-2 years may begin to refuse food for various reasons, such as teething and tend only to eat the food they like. Therefore parenting role is very influential in this condition. Parents with a good education level tend to have good nutrition knowledge as well, both from the quality and quantity of the nutrition. They can provide sufficient food and nutritional composition that the baby needs. This condition increases the security of nutritional status in children. Indirectly, a good level of education will make a person have a job with a decent wage so that the family income will be sufficient. It is known that family income also influences the incidence of stunting in the previous study.¹¹ Apart from the educational level, parenting also plays an essential role. Children whose mothers are busy working and leave their children in the nurture of other caregivers may not be fed optimally because they may let the children have eating difficulties.⁸

Based on the data above, it was found that the prevalence of stunting was higher in toddlers aged 1-2 years old compared to toddlers aged 0-1 years old, and the nutrition intake adequacy was lower in toddlers aged 1-2 years old. The achievement level of sensitive and specific intervention was still low, especially in exposure to secondhand smoke among pregnant mothers and toddlers, exclusive breastfeeding, vitamin A supplementation, deworming treatment, and access to clean water.

Table 6. Nutrition Intake Adequacy

Intake of Nutrients in Toddlers Aged 0-1 Years				
	Good	Moderate	Poor	Deficit
Energy	130	20	0	0
Protein	150	0	0	0
Fat	120	17	0	3
Carbohydrate	44	44	38	24
Calcium	110	28	4	8
Iron	70	19	37	24
Intake of Nutrients in Toddlers Aged 1-2 Years				
	Good	Moderate	Poor	Deficit
Energy	8	142	0	0
Protein	100	30	20	0
Fat	150	0	0	0
Carbohydrate	0	0	35	115
Calcium	5	0	5	140
Iron	35	18	17	80

Other than nutrition, sanitation is a crucial aspect of stunting. Sanitation is one of the sensitive indicators of stunting. Most of the communities in Tegallalang district already had lantrine and waste management, but only a few had access to clean water. Clean water is needed for drinking, cooking, bathing, and washing hand. The lack of clean water is associated with various infectious diseases, such as diarrhea and worm infections. Studies revealed that repeated infections in children may influence stunting. In theory, children who experience infections, including acute respiratory tract infection and diarrhea, will experience metabolic disturbances in their bodies due to the inflammatory response to the infection that occurs. Nutrients that can initially be used for growth will experience a shift in function to meet the metabolic needs of the immune system. In addition, various pro-inflammatory cytokines can also directly affect chondrocytes, thereby interfering with bone formation and growth processes.¹⁰ Intestinal worm infections may contribute to stunting by preventing nutrients from being absorbed in the intestines. In contrast, hookworm absorbs the host blood, causing anemia and thus hampering the nutrition and oxygen flow to the bone.⁷ Worm infections could be treated with deworming treatment, which was a mandatory government program in public health centers. Unfortunately, the coverage of deworming treatment in Tegallalang district was still low.

Most of the specific indicators of

stunting were not achieved in this study. A previous study by Astuti et al. reported that exposure to secondhand smoke in pregnant women and children under five years old for more than 3 hours a day might increase the risk of stunting by 10 times. Cigarette smoke contains nicotine which is teratogenic and may disrupt embryonic bone growth. In children, nicotine will compete with oxygen in the blood, reducing oxygen supply by up to 40% and disrupting the absorption of important minerals for children's height.¹¹

Regarding vitamin A deficiency, a study reported that children who lacked vitamin A had a 43% greater chance of experiencing stunted compared to children with adequate intake of vitamin A. Vitamin A was related to stunting through its association with the expression of the gene responsible for growth hormone (GH) and thyroid stimulating hormone (TSH). In addition, vitamin A deficiency in children was related to decreased immune systems and increased risk of diarrhea and measles.¹² The importance of vitamin A makes it one of the mandatory Indonesian government programs.

Managing 1000 days of life is a global health challenge. WHO prioritizes handling the first 1000 days of life as a key point of success for the Millennium Development Goals. Every country must pay special attention to pregnant women and toddlers in their early growth, especially in improving their nutritional status.¹³ One of the substantial efforts formulated globally in supporting 1000

First Day of Life is scaling up nutrition, namely a program to fulfill the quality of nutrition for pregnant women and toddlers.¹⁴

The nutritional status in 1000 First Day of Life will affect the quality of health, intellectuality, and productivity in the future.¹⁵ Children who experience malnutrition during the 1000 First Day of Life period may experience neurological problems, decreased learning ability, increased risk of dropping out of school, reduced productivity and ability to work, decreased income, decreased ability to provide nutritious food, and decreased ability to care for children. Furthermore, it will result in the transmission of malnutrition and poverty to the next generation. Considering the importance of nutrition for 1000 First Day of Life, nutrition interventions for 1000 First Day of Life are a top priority to improve the quality of life for future generations.¹⁶

Pregnant women and toddlers are at the highest risk of micronutrient deficiencies (MNDs).¹⁷ The deficiencies of micronutrients such as vitamin A, calcium, iron, iodine, folic acid, and zinc are may contribute to growth problems, intellectual decline, perinatal complications, and increased the risk of morbidity and mortality.¹⁸ Pregnant women are vulnerable to malnutrition due to the increased nutritional demands in pregnancy. Women in developing countries are at high risk of experiencing malnutrition during pregnancy due to socio-economic constraints, poor diet, high work intensity and reproductive cycles. The prevalence of nutrient insufficiency based on the Recommended Dietary Allowance (RDA) was respectively 86.8% carbohydrates, 59.2% protein, 78.0% fat, 83.5% calories, 55.0% calcium, 29.5% phosphorus, 45.2% iron, 85.0% thiamin, 19.2% riboflavin, 3.8% retinol, 43.2% niacin, 0.8% vitamin C and 0.8% iodine. Factors of maternal age, education level, gestational age, pre-pregnancy body mass index and levels of violence in the southern region of Thailand were significantly related to the nutritional deficiencies mentioned above.¹⁰

Another factor that causes nutritional problems in 1000 First Days of Life is the inappropriate practice of giving

complementary feeding. WHO recommends that complementary feeding be provided with balanced nutrition when the baby reaches 6 months old. However, some mothers still give early complementary food with low nutrition. There is an existing belief in rural areas in Indonesia that complementary foods will help increase the baby's weight and sleep patterns. In addition, peer influence influences the mother's decision to feed early.¹⁹ The previous study stated that influencing factors of early complementary feeding were geographic location, family economic situation, low mother's education, mother's body mass index (BMI) <18.5 kg/m², lack of antenatal care visits, lack of post-natal visits and, lack of exposure to the media.²⁰

Stunting is a multifactorial and complex problem. Thus, this study has several limitations. First, this is only a descriptive study without analyzing the association between each variable and the risk of stunting. Further study is needed to address this issue. Second, this study did not investigate many other risk factors of stunting, such as maternal height, maternal anemia, parent's education, family support, and low birth length.

CONCLUSION

The prevalence of stunting in children aged 0-2 years old in Tegallalang District is 12%. The prevalence of stunting among children 1-2 years old is higher than among children 0-1 years old. The achievement level of sensitive and specific intervention was still low, especially in exposure to secondhand smoke among pregnant mothers and toddlers, exclusive breastfeeding, vitamin A supplementation, deworming treatment, and access to clean water. Most toddlers aged 1-2 years old were deficient in carbohydrates, calcium, and iron. This shows that the problem of stunting in Tegallalang District still exists. Community health workers should encourage women and their male partners regarding second-hand smoke and exclusive breastfeeding. Access to clean water is also urgently required. Further study is needed to determine the modifiable risk factors for stunting.

ACKNOWLEDGEMENTS

The authors would like to thank all respondents and all parties who have supported the implementation of this research. Thank you to the Tegallalang Subdistrict Head for permitting analysis in Tegallalang District, Gianyar Regency.

DISCLOSURE

Author Contribution

All authors contributed to this study's conception and design, data analysis and interpretation, article drafting, critical revision of the article, final approval, and data collection.

Funding

The author's funds funded this work.

Conflict Of Interest

The authors report no conflict of interest.

Ethical Statement

The respondents already gave permission and written consent to be published.

REFERENCES

- Indonesia Health Sector Review. Indonesia: Menghadapi Beban Ganda Malnutrisi [Internet]. 2012 Dec. Available from: www.worldbank.org.
- Pradnyawati LG, Juwita DAPR, Reviani N. Risk Factors of Stunting in Kedisan, Gianyar District, Bali, Indonesia. *Jurnal Berkala Epidemiologi*. 2021;9(3):266. Available from: <http://dx.doi.org/10.20473/jbe.v9i32021.266-274>
- United States Agency. USAID Multi-Sectoral Nutrition Strategy 2014-2025. 2014.
- Ritte R, Panozzo S, Johnston L, Agerholm J, Kvernmo SE, Rowley K, et al. An Australian model of the First 1000 Days: an Indigenous-led process to turn an international initiative into an early-life strategy benefiting indigenous families. *Glob Health Epidemiol Genom*. 2016;1:e11-e11. Available from: <https://pubmed.ncbi.nlm.nih.gov/29868203>
- Jahari AB, Atmawikarta A, Atmarita, Latief D, Martianto D, Achadi EL, et al. Pedoman Perencanaan Program Gerakan Nasional Percepatan Perbaikan Gizi.
- Bailey RL, West Jr. KP, Black RE. The Epidemiology of Global Micronutrient Deficiencies. *Ann Nutr Metab*. 2015;66(Suppl. 2):22-33. Available from: <http://dx.doi.org/10.1159/000371618>
- Pradnyawati LG, Kartinawati KT, Ratna Juwita DAP. Parenting pattern of feeding in stunting toddlers at the working area of Tegallalang I Primary Health Centre. *Journal of Community Empowerment for Health*. 2019;2(2):208. Available from: <http://dx.doi.org/10.22146/jcoemph.47019>
- Walsh A, Kearney L, Dennis N. Factors influencing first-time mothers' introduction of complementary foods: a qualitative exploration. *BMC Public Health*. 2015;15:939. Available from: <https://pubmed.ncbi.nlm.nih.gov/26395331>
- Riskesdas. Laporan hasil riset kesehatan dasar Indonesia tahun 2013. 2013.
- Ms TM, Arefadib N, Deery A, West S. The First Thousand Days The First Thousand Days: An Evidence Paper Centre for Community Child Health [Internet]. 2017. Available from: www.rch.org.au/ccch
- Astuti DD, Handayani TW, Astuti DP. Cigarette smoke exposure and increased risks of stunting among under-five children. *Clin Epidemiol Glob Health*. 2020;8(3):943-8. Available from: <http://dx.doi.org/10.1016/j.cegh.2020.02.029>
- Ssentongo P, Ba DM, Ssentongo AE, Fronterre C, Whalen A, Yang Y, et al. Correction: Association of vitamin A deficiency with early childhood stunting in Uganda: A population-based cross-sectional study. *PLoS One*. 2021;16(4):e0250138-e0250138. Available from: <https://pubmed.ncbi.nlm.nih.gov/33831117>
- Martorell R. Improved nutrition in the first 1000 days and adult human capital and health. *Am J Hum Biol*. 2017;01/24. 2017;29(2):10.1002/ajhb.22952. Available from: <https://pubmed.ncbi.nlm.nih.gov/28117514>
- Pusat Data dan Informasi Kementerian Kesehatan RI. Situasi Bayi Pendek (stunting) di Indonesia. 2018.
- Krishna A, Mejia-Guevara I, McGovern M, Aguayo VM, Subramanian S V. Trends in inequalities in child stunting in South Asia. *Matern Child Nutr*. 2017;10/19. 2018;14 Suppl 4(Suppl 4):e12517-e12517. Available from: <https://pubmed.ncbi.nlm.nih.gov/29048726>
- Kattula D, Sarkar R, Sivarathinaswamy P, Velusamy V, Venugopal S, Naumova EN, et al. The first 1000 days of life: prenatal and postnatal risk factors for morbidity and growth in a birth cohort in southern India. *BMJ Open*. 2014;4(7):e005404-e005404. Available from: <https://pubmed.ncbi.nlm.nih.gov/25056979>
- Tang L, Lee AH, Binns CW. Predictors of early introduction of complementary feeding: Longitudinal study. *Pediatrics International*. 2014;57(1):126-30. Available from: <http://dx.doi.org/10.1111/ped.12421>
- Ariati NN, Fetria A, Purnamawati AAP, Suarni NN, Padmiari IAE, Sugiani PPS. Description of nutritional status and the incidence of stunting children in early childhood education programs in Bali-Indonesia. *Bali Medical Journal*. 2018;7(3). Available from: <http://dx.doi.org/10.15562/bmj.v7i3.1219>
- Husnah H. Nutrisi Pada 1000 Hari Pertama Kehidupan. *Jurnal Kedokteran Syiah Kuala*. 2017;17(3):179-83. Available from: <http://dx.doi.org/10.24815/jks.v17i3.9065>
- Gede Pradnyawati L, Ayu Putu Ratna Juwita D. Overview Of The First 1000 Days Of Life For Expectant Mothers And Toddlers Aged 0-2 Years In Gianyar Regency, Bali, Indonesia. Available from: <https://doi.org/10.33508/jwm.v8i1.4020>



This work is licensed under a Creative Commons Attribution