THE CORELLATION BETWEEN STUNTING, WASTING, AND CHILDREN'S COGNITIVE ABILITY: INDONESIA FAMILY LIFE SURVEY 2000 – 2014

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ABSTRACT

Background: Nowadays, lack of children nutritional status fulfillment is still a problem experienced by developing countries, including Indonesia. The most nutritional problems among children in Indonesia are stunting and wasting. Stunting and wasting are indicators of growth disorders including cognitive impairment. This study aimed to analyzed the correlation between stunting, wasting, and children's cognitive ability using Indonesia family Life Survey 2000-2014.
Subjects and Method: This was a cross sectional study conducted using secondary data analysis of the 3rd, 4th, and 5th Indonesian Family Life Survey (IFLS). The study took place in June-July 2020. The study subjects were children aged 7-14 years amounting to 4781 children. The dependent variable was cognitive ability. The independent variables were stunting and wasting. The data obtained from IFLS was cleansed using STATA 15 and analyzed using multilevel logistic regression using SPSS 16.1.
Results: The prevalence of stunting among children were 35.5%, wasting were 10.6%, and cognitive abilities below the average were 41.1%. Children who were not stunted were 1.33 times more likely to have cognitive abilities that matched or were above the average age of children (OR= 1.33; 95% CI= 1.18 to 1.50; p< 0.001). Children who did not experience wasting had 1.20 times the likelihood of having cognitive abilities that matched or were above the average age of children (OR= 1.33; 95% CI= 1.00 to 1.45; p< 0.001).
Conclusion: Stunting and wasting are associate with children's cognitive ability.

Keywords: stunting, wasting, children's cognitive ability, Indonesian family life survey

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BACKGROUND

The provision of adequate nutrition for children is still a problem in developing countries, including Indonesia. The World Health Assembly set a goal to reduce the prevalence of stunting and wasting, as well as to prevent obesity (Budiastutik and Rahfiludin, 2019). In Indonesia, the direction of improving nutrition in accordance with Health Law Number 36 of 2009 concerning health is to improve the quality of nutrition for individuals and communities through several strategies: improving consumption patterns with balanced nutrition; nutrition awareness behavior, physical activity, and health, increasing access and quality of nutrition services in accordance with advances in science and technology and improving food and nutrition awareness systems (Ministry of Health, 2020).

Stunting is one of the nutritional issues that children face. Stunting is a condition of a person's height that is not suitable for their age (Cahyati and Yuniastuti, 2019). Stunting is caused by insufficient nutritional intake for a long time due to feeding that is not in accordance with nutritional needs (Mayasari and Indriyani, 2018). The impact caused by stunting among children is short-term and long-term, namely increased morbidity and mortality, poor child development including

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cognitive development, increased risk of infection and non-communicable diseases (Stewart et al., 2013). The incidence of stunting in Indonesia from the results of Basic Health Research in 2010 was 35.6%, in 2013 it increased to 37.2%, in 2018 it was 30.8% (Ministry of Health, 2018).

Aside from stunting, another issue with child nutrition to consider is wasting. Wasting among children is an acute nutritional deficiency among children (WHO, 2010). The factors that affect wasting among children are caused by several things, including inadequate access to food, inadequate care for women and children, inadequate health services, and an unhealthy environment (De Onis et al., 2012). According to UNICEF data in 2019, there are 47 million children under five who experience wasting (6.9%) (UNICEF, 2020). Based on the 2018 Basic Health Research (Riskesdas), the nutritional status of children under five in Indonesia has improved from 2013 to 2018, the prevalence of wasting has decreased from 12.1% to 10.2% (Ministry of Health, 2018). However, the reduction in prevalence rates is still high based on the threshold prevalence of malnutrition set by WHO (De Onis et al., 2019).

Nutritional problems are related to cognitive abilities among children. Stunting, wasting, and underweight are indicators of growth disorders (Guerrant et al., 2014). Children with stunting have a delayed effect on children's cognitive development where the level of intelligence is low and has an impact on the quality of human resources (Budiastutik and Rahfiludin, 2019; Silva et al., 2018). Wasting also affects the decline in cognitive abilities among children (Mireku et al., 2020).

Therefore, researchers are interested in analyzing the importance of fulfilling the nutritional status of children in conditions of stunting and wasting which can affect cognitive abilities among children in Indonesia.

SUBJECTS AND METHOD

1. Study Design

This was a cross-sectional study using the secondary data analysis taken from the Indonesian Family Life Survey (IFLS). IFLS was designed to provide data for studying behavior and outcome collected at the individual and household level using stratified random sampling. This study was carried out from June to July 2020.

The IFLS survey was carried out in several enumeration areas from several provinces in Indonesia. The data taken was as much as 83% of the population, which represents the entire population in Indonesia.

2. Population and Sample

The population in this study were children aged 7-14 years. The sample in this study were children aged 7-14 years in 2014 (IFLS 5) who had done cognitive tests, the sample was selected using total sampling technique. From this group, samples were taken that had data on body length and weight at the age of 0 - 5 years in 2007 (IFLS 4) and 2000 (IFLS 3). The number of samples used after data cleaning was 4781 samples.

Figure 1 shows the data cleaning process from all IFLS 3, 4, and 5 data. Initial data collection, namely children aged 7-14 years in 2014 at IFLS 5 who had taken cognitive tests, obtained a sample of 8166 samples. Then, cleaning was performed for samples that had age and gender data, namely 8166 samples. Furthermore, looking for those who have stunting and wasting data in 2007 (IFLS 4) and 2000 (IFLS 3) totaling 4781 samples. Stunting and wasting data were obtained from samples that had data on weight, height, sex, and age in months.

3. Study Variables

The dependent variable in this study was cognitive ability. The independent variables in this study were stunting and wasting.

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5. Data Analysis

This study was analyzed using univariate, bivariate, and logistic regression analysis. Univariate analysis was used to determine the characteristics of the sample based on each variable. Bivariate analysis was used to determine the prevalence of subjects based on the relationship between two variables using the chi square method. In multivariate analysis, the logistic regression model used is the binary Logit model because the dependent variable has a nominal or ordinal measurement scale and only consists of two categories of qualitative choices (Junaidi, 2015).

Data analysis was performed using STATA 15 and SPSS 16.1 software. Anthropometric measurements resulted in z-scores processed using z-score 06 according to height/ age (height per age) and weight/ height (body weight for body height) in STATA 15 software.

6. Ethical Clearance

The IFLS had been approved ethically by the ethics committee in the USA, namely the Institutional Review Boards at the Rand Corporation, Santa Monika California. IFLS had also passed the ethics commission in Indonesia, namely at Gajah Mada University (UGM), University of Indonesia (UI) and the Ethics Commission of the Faculty of Medicine, Airlangga University (UNAIR) (Fajaryah and Hidajah, 2020; Rachmi et al., 2016).

RESULTS

1. Sample characteristics

The descriptive categorical data sample describes the continuous data of each research variable including the age of the child, stunting, wasting, and cognitive scores. The results of the analysis of categorical data sample description shown in the Table 1.

Table 1. Description of sample characteristics (continuous data)

Variable	N	Mean	SD	Min	Max
Age	4781	6	14	9:55	2:07
Weight	4781	1.7	115.3	11:40	7:39
NET	4781	40	197	82.22	15:53
Cognitive Score	4781	0	17	9.93	3.97

2. Univariate Analysis

Table 2 shows a total of 30 subjects (0.6%) were 6 years old, 540 subjects (11.2%) were 7 years old, 530 subjects (11.0%) were 8 years old, 964 subjects (20.1%) were 9 years old, 710 subjects (14.8 %) were 10 years old, 602 subjects (12.5%) were 11 years old, 608 subjects (12.7) were 12 years old, 637 subjects (13.3%) were 13 years old, 50 subjects (1.0%) were 14 years old. There were 2474 male subjects (51.8%) and 2306 female subjects (48.2%). Children with stunting were 1696 subjects (35.92%) and non-stunted children were 3025 subjects (64.0%). Children with wasting were 1326 subjects (35.5%) and children who were not wasting were 2237 subjects (64.5%). Children with cognitive less than the average were 1963 subjects (41.1%) and children with cognitive matches an average of 2818 subjects (58.9%).

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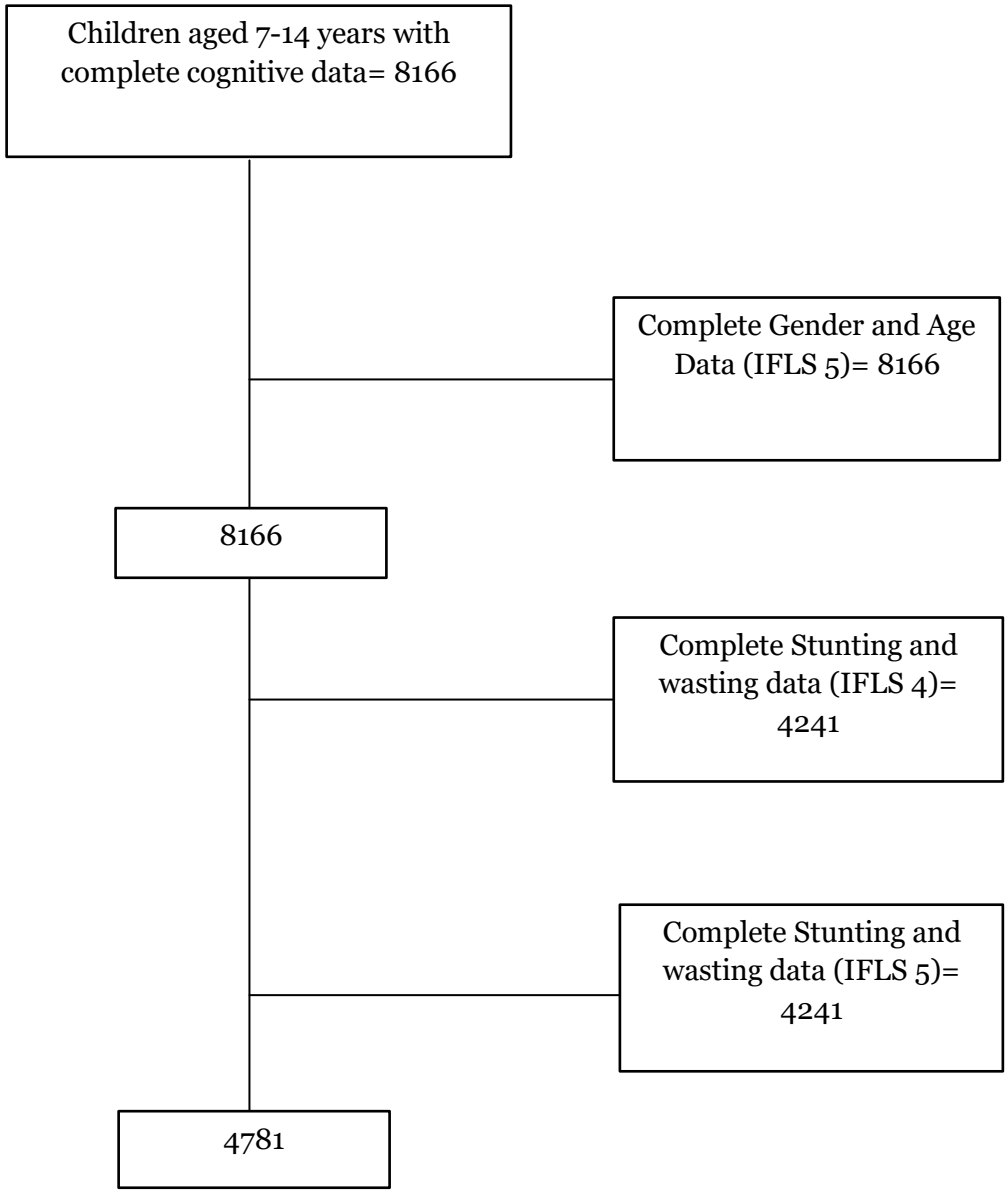

Figure 1. Data Cleaning Process Flowchart

Table 2. Description of the characteristics of the categorical data sample

Variable	Frequency	%
Age of children (years)	4781	
6	30	0.6
7	540	11.2
8	530	11.0
9	964	20.1
10	710	14.8
11	602	12.5
12	608	12.7
13	637	13.3

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14	50	1.0
Gender		
Male	2475	51.8
Female	2306	48.2
Stunting		
Stunted	1696	35.5
Not Stunted	3025	64.5
Wasting		
Wasting	1326	10.6
Not Wasting	2237	89.4
Cognitive		
Less than Average	1963	41.1
According to Average	2818	58.9

3. Bivariate Analysis

In Table 3, it is found that the subjects who are stunted with cognitive below average are as many as 773 children (39.4%) and those who were not stunted with cognitive below the average were 1190 children (60.6%). Meanwhile, there were 923 children who were stunted with cognitive above average (32.8%) and 1895 (67.2%) who were not stunted. The p value <0.001, which means that there was a significant relationship between history of stunting and cognitive function in Indonesian children. The OR of 1.33, which means that children who had a history of stunting have a cognitive score below the average of 1.33 times greater than children without a history of stunting.

Table 3 Correlation between Stunting and Cognitive

Variables	**Cognitive**				
	Below Average	**Above Average**	**OR**	**95% CI**	**p**
Stunted	773	923	1.33	1.18 to 1.50	<0.001
Not Stunted	1190	1895			

In table 4, it was found that there were 230 children (11.7%) who were wasting with a cognitive lower average and 1733 children who were not wasting with a cognitive lower average (88.3%). Meanwhile, there were 279 children who were wasting with cognitive above average (9.9%) and 2539 (90.1%) who were not wasting above the average. The p value = 0.045, which means that there was a significant relationship between history of wasting and cognitive function in Indonesian children. The OR was 1.21, which means that children who had a history of wasting have the possibility of cognitive function below an average of 1208 times greater than children without a history of wasting.

Table 4 Relationship between Wasting and Cognitive

Variables	**Cognitive**				
	Below Average	**Above Average**	**OR**	**95% CI**	**p**
Wasting	230	279	1.21	1.00 to 1.45	<0.001
Not Wasting	1733	2539			

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4. Multivariate Analysis

Based on the multivariate test the stunting variable has p<0.001, while wasting has p = 0.017. These results reported that stunting and wasting had a significant effect on cognitive. Out of the two variables the most dominant was stunting.

Table 5 Logistic regression analysis of cognitive abilities on the independent variable

Variables	B	OR	95% CI		P
			Lower	Upper	
Stunting	0.3	1.35	1.20	1.52	<0.001
Wasting	0.23	1.25	1.04	1.51	0.017

DISCUSSION

1. The relationship between Stunting and Cognitive Ability

Stunting can be identified by assessing the length or height of the child and interpreting the measurements This is by comparing the standards set by WHO, namely -2 SD based on the WHO Child Growth Standards for children of the same age and sex (Onis and Branca, 2016). The prevalence of stunting among children in Indonesia aged 24 - 59 months is 53.3% (95% CI [51.2, 55.4]) (Rachmi et al., 2016). In Titaley et al's (2013) study of 24,657 children in Indonesia who were under 2 years old, 33.7% were stunted (p = 0.010).

Factors that influence the occurrence of stunting include direct and indirect factors. Direct factors, including those related to nutrition intake and infectious diseases (Rahmadini, 2020). Stunting children are affected by nutritional fulfillment before or after birth. Stunting also affects the occurrence of infectious diseases which has the potential to cause an increase in under-five mortality (Grantham-McGregor et al., 2007).

Cognitive abilities describe the adaptive ability to identify, manipulate and process information that is relevant for individuals to behave (Breukelaar et al., 2018). Cognitive abilities involve the ability to reason, plan, solve problems, and think abstractly (Degerud et al., 2018).

In a study by Id et al. (2020), it is stated that the cognitive abilities of children aged 8 and 11 years are considered lower when children are stunted from birth to 2 years of age. Stunting at the age of 0-2 years is directly related to impaired cognitive, language and motor development (Sudfeld et al., 2015). Significant brain growth and development occurs in the third trimester of pregnancy until the age of 2 years (Prado and Dewey, 2014).

According to Alamy, stunting, which is a condition of chronic nutritional deficiency, can have an impact on cell count, cell migration, myelinization, synaptogenesis, hippocampal formation and neuro-transmission of neuro-transmission in the brain structure of mice so that it can interfere with cognitive development (Alamy and Bengelloun, 2012) .

Fulfilling the needs of macronutrients and micronutrients is very important for the growth of brain networks in supporting cognitive and social development (Muhoozi et al., 2016). Improving children's nutrition from an early age is needed to improve children's cognitive abilities that affect the process of children's independence and educational attainment (Kitaso-Wekolu et al., 2013; Mahendradhata et al., 2017). Therefore, nutrition before pregnancy until the child is in their infancy is very important because chronic nutritional disorders, i.e.,

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stunting, will affect the development of cognitive abilities among children.

2. Relationship between Wasting and Cognitive Ability

Wasting is a child aged less than 5 years whose ratio of body weight and height is less than two standard deviations determined by WHO, generally due to insufficient nutritional intake and a history of past infections (Ilman and Wibisono, 2019). Wasting is directly affected by MP-ASI and Low Birth Weight. Wasting is a strong predictor of mortality and morbidity among children under five (Ayuningrum et al., 2018).

During infancy (0-24 months), children who are well nourished will experience rapid growth, not only in physical growth but also in brain development. Thus, the maximum speed during growth will be disrupted if the child is malnourished, causing impaired brain development, consequently delayed cognitive development (Mireku et al., 2020). In several studies, it is stated that losing in preschool children affects suboptimal motor function, non-verbal reasoning, and low cognitive development (Children et al., 2015; Haile et al., 2016).

Repeated nutritional deficiencies early in life can lead to decreased cognitive abilities and prevent children from developing their potential (Lukowski et al., 2011). Efforts to improve the prevention of malnutrition among children who are in a developmental phase are important to improve cognitive function (Park et al., 2011). Thus, prevention of wasting is needed to improve children's cognitive abilities in order to develop self-potential.

REFERENCE

Alamy M, and Bengelloun WA. (2012). Malnutrition and brain development: An analysis of the effects of inadequate diet during different stages of life in rat. Neuroscience and Biobehavioral Reviews Elsevier, 36 (6): 1463–1480. https://doi.org/10.1016/j.neubiorev.2012.03.009

Ayuningrum IY, Murti B, Salimo H, Dewi YLR (2018). Exclusive breastfeeding, complementary feeding, low birthweight, and wasting among children under-five: A path analysis evidence from Indonesia. Asian Journal of Pharmaceutical and Clinical Research, 11 (12): 174–178. https://doi.org/10.22159-/ajpcr.2018.v11i12.28068

Breukelaar, IA, Williams, LM, Antees, C., Grieve, SM, Foster, SL, Gomes, L., and Korgaonkar, MS (2018). Cognitive ability is associated with changes in the functional organization of the cognitive control brain network. Hum Brain Mapp, May: 1–11. https://doi.org/10-.1002/hbm.24342

Budiastutik I and Rahfiludin MZ (2019). Risk Factors for Stunting among children in Developing Countries Risk Factors of Child Stunting in Developing Countries. Amerta Nutr: 122–126. https://doi.org/-10.2473/amnt.v3i3.2019.122-129

Cahyati WH, Yuniastuti A. (2019). Disparity of Risk Factors Stunting on Toddlers in the Coast and the Mountain Areas of Sinjai, South Sulawesi. Public Health Perspective Journal, 4 (3), 196–205.

De Onis M, Blössner M, Borghi E (2012). Prevalence and trends of stunting among pre-school children, 1990-2020. Public Health Nutrition, 15 (1): 142–148. https://doi.org/10.1017/S136898001101315

De Onis M, Borghi E, Arimond M, Webb P, Croft T, Saha K, De-Regil LM, Thuita F, Heidkamp R, Krasevec J, Hayashi C, Flores-Ayala R (2019). Prevalence thresholds for wasting, overweight and stunting among children under 5 years. Public Health Nutrition, 22 (1): 175–179. https://doi.org/10.1017/S1368980018O

https://doi.org/10.26911/the7thicph-FP.03.40

02434
Degerud E, Ystrom E, Tambs K, Ariansen I, Mørland J, Magnus P, Smith GD, Næss Ø (2018). The interplay between cognitive ability, alcohol consumption, and health characteristics. Psychological Medicine. https://doi.org/https://doi.org-/10.1017/S0033291717003543
Guruyah RN, Hidajah AC (2020). correlation between immuniz ation status and mother 's height, and stunting among children 2 - 5 years in Indonesia. JBE, 8: 89–96. https://doi.org/10.20473/jbe.v-8i12020.
Grantham-mcgregor S, Cheung YB, Cueto S, Glewwe P, Richter L, Strupp B (2007). Child development in developing countries 1 Developmental potential in the first 5 years for children in. The Lancet, 369.
Guerrant RL, Deboer MD, Moore SR, Scharf RJ, Aldo AM (2014). The Impoverished gut - A Triple Burden of Diarrhea, Stunting and Chronic Disease. Nat Rev Gastroenterol Hepatol, 10 (4): 220–229. https://doi.org/10.1038/nrgastro.2012.239 The
Haile D, Nigatu D, Gashaw K, Demelash H. (2016). Height for age z score and cognitive function are associated with Academic performance among school children aged. Archives of Public Health, 1–7. https://doi.org/10.1186/s13690-016-0129-9
Harding KL, Aguayo VM, Webb P. (2018). Factors associated with wasting among children under five years old in South Asia: Implications for action. PLoS ONE, 1–17.
Id AA, Richard SA, Mohammad S, Id F, Id, MM, Nahar B, Id S. Das, Shrestha B, Koshy B, Mduma E, Seidman JC, Id LEM, Id LEC, Id TA (2020). Impact of early-onset persistent stunting on cognitive development at 5 years of age: Results from a multi-country cohort study. PLoS ONE, 10, 1–16. https://-doi.org/10.1371/journal.pone.0227839
Ilman AS, Wibisono ID (2019). Analysis of Food Prices and Stunting Prevalence in Indonesia. CIPS.
Junaidi (2015). Binary logit regression model (Model Application with SPSS Program). June. https://doi.org/10.13140-/RG.2.1.1580.0481
Kitaso-Wekolu P, Holding P, Taylor HG, Abubakar A, Kvalsvig J, Connolly K. (2013). Nutrition as an important mediator of the impact of background variables on outcome in middle childhood. Frontiers in Human Neuroscience, 7 (October): 1–11. https://doi.org/10.338-9/fnhum.2013.00713
Leroy J (2011). ZSCORE06: Stata module to calculate anthropometric z-scores using the 2006 WHO child growth standards Statistical Software Components S4572-79 (revised 04 Oct 2011). Boston College Department of Economics.
Lúcio PS, Cogo-Moreira H, Puglisi M, Polanczyk GV, Little TD. (2017). Psychometric investigation of the Raven's Colored Progressive Matrices Test in a sample of preschool children. SAGE Pub, 26 (7): 1399–1408. https://doi.org/10.1177/10-73191117740205
Lukowski AF, Koss M, Burden MJ, Jonides J, Nelson C, Kaciroti N, Jimenez E, Lozoff, B (2011). Iron Deficiency in Infancy and Neurocognitive Functioning at 19 Years: Evidence of Long-Term Deficits in Executive Function and Recognition Memory. Nutr Neurosci, 13 (2): 54–70. https:-//doi.org/10.1179/147683010X12611-460763689.Iron
Mahendradhata Y, Trisnantoro L, Listyadewi S, Soewondo P, Marthias T, Harimurti P, Prawira J (2017). Asia Pacific Observatory on Health System and Policies. The Republic of Indonesia Health Sys-

tem Review, 7 (1).
Mayasari D, Indriyani R (2018). Stunting, Risk Factors and Prevention of Stunting, Risk Factors and Prevention. Journal of Agromedicine, 5 (1): 540–545.
Ministry of Health. (2018a). Stunting Situation in Indonesia. In Bulletin of Health Data and Information Window.
Ministry of Health (2018b). Main Results of Basic Health Research (RISKESDAS). In Journal of Physics A: Mathematical and Theoretical (Vol. 44, Issue 8, pp. 1–200). https://doi.org/10.1088/1751-811-3/44/8/085201
Ministry of Health. (2020). Regulation of the Minister of Health of the Republic of Indonesia (Issue 3, pp. 1–78).
Mireku MO, Cot M, Massougbodji A, Bodeau-livinec F (2020). Relationship between Stunting, Wasting, Underweight and Geophagy and Cognitive Function of Children. Journal of Tropical Pediatrics, 1–11. https://doi.org/10.1093/tropej/fmaa009
Muhoozi GKM, Atukunda P, Mwadime R, Iversen PO, Westerberg AC, Muhoozi GKM, Atukunda P, Mwadime R, Iversen PO (2016). Nutritional and developmental status among 6- to 8-month-old children in southwestern Uganda: a cross-sectional study. Food and Nutrition Research, 6628. https://doi.org/-10.3402/fnr.v60.30270
Onis M. De, Branca F (2016). Review Article Childhood stunting: a global perspective. Maternal and Child Nutrition, 12, 12–26. https://doi.org/10.1111/mcn.12-231
Park H, Bothe D, Holsinger E, Kirchner HL, Olness K, Mandalakas A (2011). The Impact of Nutritional Status and Longitudinal Recovery of Motor and Cognitive Milestones in Internationally Adopted Children. Int. J. Environ. Res. Public Health, 8 (Mdi): 105–116. https://doi.-org/10.3390/ijerph8010105
Pasaribu EO (2019). Analysis of determinants of excess nutrition and its relation to cognitive function of children in Indonesia. Bogor Agricultural Institute.
Prado EL, Dewey KG (2014). Nutrition and brain development in early life. Nutrition Reviews, 72 (4): 267–284. https://-doi.org/10.1111/nure.12102
Rachmi CN, Agho KE, Li M, Baur LA (2016). Stunting, Underweight and Overweight among children Aged 2. 0 - 4. 9 Years in Indonesia: Prevalence Trends and Associated Risk Factors. PLoS ONE, 1–17. https://doi.org/10.1371/journal.p-one.0154756
Rahmadini A (2020). Literature Review: The Relationship of Stunting with Children's Motor and Cognitive Development. National Seminar on Health, 90–104.
RAND Corporation. (2014). Indonesian Family Life Survey (IFLS) Study Design _ RAND.
Silva TM, Bueno NB, De M. de L. da SG, Azevedo, Clemente APG, Florêncio TM de MT (2018). Pre-School Children Undergoing Nutritional Recovery Treatment. Rev Paul Pediatr, 36 (1): 39–44. https://doi.org/http://dx.doi.org/10.1590/1984-0462/;2018;36;1;00007
Stewart CP, Iannotti L, Dewey KG, Michaelsen KF, Onyango AW (2013). Contextualizing complementary feeding in a broader framework for stunting prevention. Maternal and Child Nutrition, 9 (S2): 27–45. https://doi.org/10.1111/-mcn.12088
Sudfeld CR, Mccoy DC, Danaei G, Fink G, Ezzati M. (2015). Linear Growth and Child Development in Low- and Middle-Income Countries: A Meta-Analysis. Pediatric, 135 (5). https://doi.org/10.15-42/peds.2014-3111
Sudfeld CR, Mccoy DC, Fink G, Muhihi A, Bellinger DC, Masanja H, Smith ER,

Godaars D, Ezzati M, Fawzi WW (2015). Malnutrition and Its Determinants Are Associated with Suboptimal Cognitive, Communication, and Motor Development in. The Journal of Nutrition, C, 1–10. https://doi.org/10.3945/jn.115.215996.1

Titaley CR, Ariawan I, Hapsari D, Muasyaroh A. (2013). Determinants of the Stunting of Children Under Two Years Old in Indonesia: A Multilevel Analysis of the 2013 Indonesia Basic Health Survey. Nutrients, 11 (1106): 2–13.

UNICEF (2020). Malnutrition among children - Unicef Data. In Unicef Data (p. 1).

WHO (2010). Interpretation Guide. World Health Organization Document Production Service.

https://doi.org/10.26911/the7thicph-FP.03.40