



Risk factors of undernutrition among under-two children in West Java (SSGI 2021)

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ABSTRAK

Latar Belakang: : Permasalahan gizi di Jawa Barat masih tinggi. Berdasarkan Survei Status Gizi Indonesia (SSGI) tahun 2021 prevalensi stunting, wasting dan underweight pada balita di Jawa Barat yaitu 20.5%, 5.3% dan 15%. Faktor risiko yang mempengaruhi kekurangan gizi beragam dan berpotensi berubah dari waktu ke waktu. Oleh karena itu, sangat penting untuk menilai status gizi untuk meninjau kesenjangan dalam faktor risiko.

Tujuan: Penelitian ini dilakukan untuk menganalisis faktor risiko stunting, wasting, dan underweight pada baduta di Jawa Barat.

Metode: Penelitian ini menggunakan studi cross sectional menggunakan data sekunder yang terdiri dari 1203 subjek baduta usia 6-23 bulan di Jawa Barat. Faktor risiko stunting, wasting, dan underweight di analisis menggunakan regresi logistik.

Hasil: Prevalensi stunting, wasting, dan underweight pada baduta usia 6-23 bulan berturut-turut sebesar 20.5%, 5.7% dan 11.6%. Faktor risiko stunting adalah usia 12-23 bulan (AOR=3.10 CI 95% 2.16-4.45), panjang lahir pendek (AOR=1.85 CI 95% 1.30-2.62), tingkat pendidikan ibu rendah (AOR=1.97 CI 95% 1.45-2.68) dan tidak menyusui (AOR= 0.46 CI 95% 0.31-0.68). Faktor risiko wasting adalah tingkat pendidikan Ibu (AOR=0.5 CI 95% 0.34-0.94). Faktor risiko underweight adalah usia 12-23 bulan (OR=1.92 CI 95% 1.25-2.95) dan tidak ASI eksklusif (AOR=0.54 CI 95% 0.35-0.83).

Kesimpulan: Faktor yang memengaruhi stunting yaitu usia, panjang lahir, tingkat pendidikan ibu, dan status menyusui. Faktor yang memengaruhi wasting yaitu tingkat pendidikan ibu. Faktor yang memengaruhi underweight yaitu usia dan riwayat ASI eksklusif.

KATA KUNCI: baduta; faktor risiko; gizi kurang; Jawa Barat



ABSTRACT

Background: : Nutritional problems in West Java are still high in number. According to the 2021 Indonesian Nutrition Status Survey (SSGI) the prevalence of stunting, wasting and underweight in under-five children in West Java are stated as 20.5%, 5.3% and 15% whereas the risk factors affecting malnutrition are diverse and have the potential to change over time. Therefore, it is very important to assess current nutritional status to review gaps in risk factors.

Objectives: This research was conducted to analyze the risk factors for stunting, wasting and underweight in under-two children of West Java.

Methods: This research is a cross-sectional study using secondary data consisting of 1203 under-aged subjects (6-23 months) in West Java. Risk factors of stunting, wasting, and underweight were analyzed using logistic regression.

Results: The prevalence of stunting, wasting and underweight among children aged 6-23 months were 20.5%, 5.7% and 11.6%, respectively. The risk factors for stunting are age 12-23 months (AOR=3.10 CI 95% 2.16-4.45), short birth length (AOR=1.85 CI 95% 1.30-2.62), mother's low education level (AOR=1.97 CI 95% 1.45-2.68) and not breastfeeding (AOR= 0.46 CI 95% 0.31-0.68). The risk factor for wasting is the level of education of the mother (AOR=0.5 95% CI 0.34-0.94). The risk factor for underweight is age 12-23 months (OR=1.92 95% CI 1.25 -2.95) and does not have exclusively breastfed (AOR=0.54 CI 95% 0.35-0.83).

Conclusions: Influential factors to stunting are age, birth length, mother's education level, and breastfeeding status. Factor influences wasting is the education level of the mother. Factors influence underweight are age and history of exclusive breastfeeding.

KEYWORD: risk factors; undernutrition; under-two children; West Java

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INTRODUCTION

In 2045 Indonesia will heading to a demographic bonus, a condition that occurs when a country has a higher number of productive age population than non-productive age population. If human assets of Indonesia are not high in quality no benefit can be gained from our demographic bonus, only a big burden for the country. Therefore, it requires various efforts to realize the era of Indonesia golden generation, namely future human resources, which have a very strategic role in the success of national development. Nutritional problems are still a real challenge in Indonesia. In the world, there are 149.2 million children under five years old who experiencing stunting and 45.4

million children experiencing wasting (23). Stunting, wasting and underweight are growth disorders in children under five years old due to malnutrition. In the First Thousand Days of Life (1000 HPK), malnourished children are most likely to experience cognitive development problems when appropriate early intervention is not carried out. Malnutrition has a role not only in increasing morbidity and mortality, but also in disturbing psychosocial aspects and intellectual development.

There are three criteria for malnutrition; stunting, wasting and underweight which reflected a growth failure both in the past and in the present time. These three malnutrition problems are

interrelated. Malnutrition can affect anyone in society, but infants and toddlers are the most vulnerable group to malnutrition since this group requires high level nutrients for their growth and development. However, nutrition deficiencies in the 1000 HPK period can still be corrected.

West Java Province becomes the benchmark for managing stunting since it has the largest population in Indonesia of almost 50 million people. West Java is a province with a quite large under-five population also the province with the highest number of under-five population in Indonesia 4,308,604 children (4). If West Java can reduce its nutritional problems (stunting, wasting and underweight) significantly, then of course the prevalence of nutritional problems at the national level will also decrease significantly.

The nutritional problems in West Java still existed in high number. According to 2021 Indonesian Nutritional Status Survey (SSGI), prevalence of stunting, wasting and underweight in West Java are stated as follow: 24.5%, 5.3%, and 15%. However, in 2022, stunting and underweight prevalence declined into 20.2% and 14.2%. These figures are in contrast to wasting prevalence that experiencing increase percentage by 6%. It illustrates the same phenomenon to an increase in the wasting prevalence at national level. It showed the under-five malnutrition problem in Indonesia particularly in West Java keep alarming so this problem needs a serious attention from the government.

Stunting, wasting and underweight can be influenced by many factors, both direct and indirect factors include the individual and household level factors. Risk factors affected malnutrition are diverse and potentially able to change over time. Researches examine risk factors for stunting and malnutrition in under-two children in Indonesia had been conducted by Titaley et.al (2019), Sudikno et.al (2022), and Nahdiyah et.al (2014) meanwhile for researches related to risk factors for wasting and underweight for under-two children are still limited.

Research in analyzing risk factors for stunting, wasting and underweight in under-two children into one study is still limited. This study

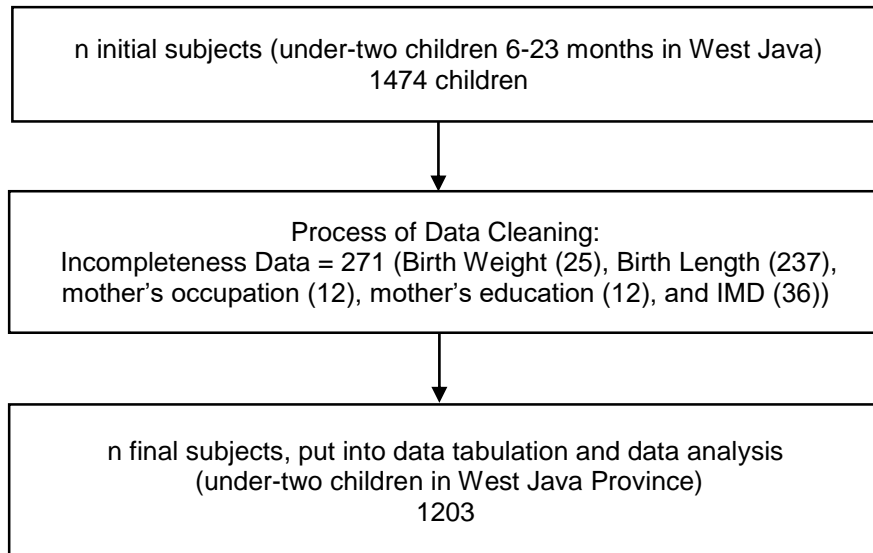
uses more independent variables than previous one and we include consumption of unhealthy snacks which rarely analyzed variable. Hence, it is very important to assess current nutritional status to review gap in risk factors for designing the effective intervention strategies. Therefore, it is important to analyze risk factors for malnutrition/undernutrition status (stunting, wasting, and underweight) to under-two children in West Java Province.

MATERIALS AND METHODS

This study is applying a cross-sectional design by using secondary data from the 2021 Indonesian Nutrition Status Survey (SSGI). The subject of SSGI 2021 is under-five, while this study uses the subject of under-two children (6-23 months) in West Java and that has never been processed. West Java is the province with the highest number of under-fives. Data processing and data analysis in this study were carried out from June 2023 to August 2023 in Bogor. The process of selecting subjects for SSGI 2021 was taken by a stratified two stage sampling. The inclusion criteria established for this study is households that have children 6-23 months age and have a complete data. The stages of subject screening are shown in **Figure 1**.

Dependent variables of this study are stunting, wasting and underweight meanwhile the independent variables consisted of: (1) subject characteristics (age, gender, birth weight and birth length), (2) family socioeconomic characteristics (number of family members, number of under-two children in the family, parents' employment status, parents' education level, ownership of wealth assets and area of residence), (3) environmental sanitation (condition of drinking water and toilet/latrines), (4) parenting patterns (Early Breastfeeding Initiation/IMD, history of exclusive breastfeeding, history of weaning/complimentary food, breastfeeding status, food consumption diversity and unhealthy snacks), and (5) infectious diseases (diarrhea and ARI). (6) Data analysis employing univariate, bivariate, and multivariate logistic regression.

Figure 1 Stages of Subject Selection



RESULTS AND DISCUSSIONS

Total subjects of this study were 1203 children under the age 6-23 months. The prevalence of stunting, wasting and underweight among children of age 6-23 months are stated in order of 20.5 %, 5.7%, and 11.6 %, as presented in Table 1. The age of most subjects were 12-23 months (66.7%), male children (52.1%), normal birth weight (94.9%), and normal birth length (82%). Most of the fathers had low education level (58.8%), mother had low education level (56.9%), fathers are working (93.5%), mothers do not work (80%), small families (51.9%), and have >1 under-two children in the family (93.4%). Economic status seen from the wealth asset of the family were categorized into: high wealth asset (41.5%), medium wealth asset (20.2%), and low wealth asset (38.3%). According to the area of residence, most subjects live in urban areas (67.2%).

Most subjects (51.9%) did not experience Early Breastfeeding Initiation (IMD), got exclusive breastfeeding (68.2%), have their first weaning/complementary foods at the age of >6 months (68.2%) and subject still breastfeeding (75.8%). Most subjects (63.8%) consumed unhealthy snacks (puff/dry/hollow snacks/extrudates such as crackers, cheese ball,

and others), and subject already consumed a variety of foods or > 5 food groups (63.8%).

Most subjects (64.1%) did not experience ARI, however, there were still 432 children (35.9%) experienced ARI for the past one month. Based on SSGI data (2021) this figure is higher than ARI prevalence of under-five children at the national level (24.1%) and also higher than ARI prevalence of under-five children in West Java (33.5%). Most subjects (81.5%) did not experience diarrhea, but there were 223 children (18.5%) who had diarrhea last month. According to data of 2021 Indonesian Nutritional Status Survey (9) this figure is higher than the prevalence of diarrhea in toddlers at the national level (9.8%) and also higher than the ARI prevalence in under-five children in West Java (5.4%).

Environmental sanitation is observed from the condition of drinking water and toilets/latrines. Most subjects (65.6%) have access to inadequate drinking water, where this figure is higher than access to inadequate drinking water at the national level (33.7%). For drinking water source was dominated by refill water, and most subjects (76.1%) already have decent toilets/latrines, however, this figure is still lower than the national level access to proper toilets/latrines (81.9%).

Table 1. Characteristic of subject of the study

Characteristics	n=1203	(%)	Mean±SD
Nutritional Status			
<i>Stunting</i>	247	20.5	
Not <i>stunting</i>	956	79.5	
<i>Wasting</i>	69	5.7	
Not <i>wasting</i>	1134	94.3	
<i>Underweight</i>	139	11.6	
Not <i>underweight</i>	1064	88.4	
Age			14.49 ± 5.08
12-23 months	803	66.7	
6-11 months	400	33.3	
Gender			
Male	627	52.1	
Female	576	47.9	
Birth Weight (gram)			3137.86 ± 429.88
<2500 gram	61	5.1	
≥2500 gram	1142	94.9	
Birth Length (cm)			48.95 ± 2.23
<48 cm	216	18.0	
≥48 cm	987	82.0	
Father Education Level			
Low	707	58.8	
High	496	41.2	
Mother Education Level			
Low	684	56.9	
High	519	43.1	
Father Employment Status			
Working	1125	93.5	
Not Working	78	6.5	
Mother Employment Status			
Working	240	20.0	
Not Working	963	80.0	
Number of Member of the Family			4.73 ± 1.50
≥ 8	56	4.7	
5 – 7	523	43.5	
≤ 4	624	51.9	
Number of Toddlers			1.17 ± 0.41
>1	1124	93,4	
1	79	6,6	
Wealth Assets			
Low	461	38.3	
Middle	243	20.2	
High	499	41.5	
Residence Area			
Rural	395	32.8	
Urban	808	67.2	
Food Consumption Diversity			4.94 ± 1.61
<5 (Diverse)	436	36.2	
≥ 5 (Not Diverse)	767	63.8	

Characteristics	n=1203	(%)	Mean±SD
Early Breastfeeding/IMD			
No	624	51.9	
Yes	579	48.1	
History of Exclusive Breastfeeding			
No	383	31.8	
Yes	820	68.2	
First Complementary/Weaning Food (months)			5.91 ± 2.84
< 6 months	383	31.8	
≥ 6 months	820	68.2	
Breastfeeding Status			
No	291	24.2	
Yes	912	75.8	
Unhealthy Snack Consumption			
Yes	735	61.1	
No	468	38.9	
ARI			
Yes	432	35.9	
No	771	64.1	
Diarrhea			
Yes	223	18.5	
No	980	81.5	
Water Consumption Condition			
Not healthy	789	65.6	
Healthy	414	34.4	
Toilet/Latrine Condition			
Poor condition	288	23.9	
Decent condition	915	76.1	

Result of multivariate analysis is presented in **Table 2**, showing the subjects with age of 12-23 months become a risk factor for stunting. Subject of age group 12-23 months have a bigger risk to experience stunting 3.10 times greater than age group of 6-11 months (AOR=3.10 95% CI: 2.16-4.45). Result analysis of this study are in line with research in Indonesia which showing the age of 12-23 months is a risk factor for stunting (AOR=1.89 95% CI: 1.54-2.32) (18). Same result was also reported from a study from three provinces in Indonesia (NTT, Papua and Central Java) where children of age 12-23

months were a risk factor for stunting (AOR=4.40; 95% CI: 2.97-6.53) (20). It also strengthened by a systematic review report, as the children gets older, this increasing age is a risk factor for stunting (2). From Akombi *et al.* (2017) stated that older children already able to crawl and walk, and they begin to receive weaning or complementary food. Moreover, older children are more susceptible to get contamination from water, food, soil that enter their mouth. So, they are susceptible to infection which then reduce their food appetite and food consumption (5).

Table 2. Multivariate analysis of stunting, wasting, and underweight to under-two children (6-23 months)

Variable	p-value	AOR (95% CI)
Stunting		
Age		1
6-11 months		1
12-23 months	<0.001	3.10 (2.16-4.45)
Birth Length		
≥48 cm		1
<48 cm	0.001	1.85 (1.30-2.62)
Mother Education Level		
High		1
Low	<0.001	1.97(1.45-2.68)
Breastfeeding Status		
Yes		1
No	<0.001	0.46 (0.31-0.68)
Wasting		
Mother Education Level		
High		1
Low	0.029	0.57(0.34-0.94)
Underweight		
Age		
6-11 months		1
12-23 months	0.003	1.92 (1.25-2.95)
History of Exclusive Breastfeeding		
Yes		1
No	0.005	0.54 (0.35-0.83)

This study found the subjects with birth length <48 cm were a risk factor for stunting. Subjects with birth length <48 cm had a 1.85 greater risk of stunting than the group with birth length >48 cm (AOR=1.85 95% CI: 1.30-2.62). The results of study analysis is in line with a study from rural Purwokerto which reported children with birth length <48 cm have a 16.4 times greater risk of experiencing stunting at the age of 12 months when compared to children who born with normal birth length (11). In addition, it was strengthened by another research using Indonesian Basic Health Research (Riskesdas) data 2018 that showed the birth length <48 cm was a risk factor for stunting (AOR=1.50 95% CI: 1.35-1.66) (17). In preventing a short birth length, good nutritional status from the expectant mother is needed in before and during the pregnancy period and to have Antenatal Care (ANC) visits at least 4 times during pregnancy. Nutritional status of the

mother before pregnancy has 76 % effect to the baby's birth length (13).

In this study, it was found the mother's education level influencing the stunting occurrence. A low education level of the mother is a risk factor for stunting (AOR=1.97 95% CI: 1.45-2.68) which means the low education mother has 1.97 times more at risk of having stunted children. These results are in line with studies in Central Java and NTT that reported mother education was a risk factor for stunting (8,18). These results were also strengthened by research based on Riskesdas data in 2013 and 2018 which showed mother's low education was a risk factor for stunting (21,1).

Mothers with low level of education do not prepare variety of diets for their children so they are at risk of stunting (3). Mother's education can influence nutrition knowledge, the parenting patterns in appropriate feeding and health care so it can stimulate optimal growth of children

(6,7). The mother's education can influence decisions in determining children health since the mother will be more selective in providing good and nutritious food to their children. In addition, it will also affect the application of parenting and the application of proper food for their children (15).

Non-breastfeeding status in children is a protective factor for stunting (OR=0.46 95% CI: 0.31-0.68) which means mother who do not breastfeed their children have a 0.46 times lower risk of having stunted children. This is evidenced by the mean HAZ in subjects who were still breastfed being 0.39 lower than those who were not breastfed. This showed mothers who are still breastfeeding their children do not guarantee their children will not experience stunting. It is presumably happened since stunting is a chronic nutritional status, so children who are breastfed or having a breastfeeding status do not guarantee that the children able to avoid stunting. Most children (63.8%) who are still breastfed are aged of 12-23 months. This result is in line with a systematic review stated that long duration of breastfeeding (>12 months) is a factor associated with stunting (2). It can be caused by the longer the baby is breastfed, the quality of breast milk will decrease. After 6 months, the quality of breast milk decreases and the mother's nutrition intake will greatly determine quality of breast milk (22). However, this study could not analyze the mother's nutrition intake. In addition, the study found that mothers who were currently breastfeeding had more children who were not exclusively breastfed compared to mothers who were not currently breastfeeding (77.5% vs 61.2%).

Most percentage of mother's education in the study was found in the low category (56.9%), but majority of wasting children had mothers with higher education (58%). In this study, it was found the mother's education level influencing the wasting occurrence ($p=0.013$). Mother's low education level is a protective factor for wasting (AOR=0.57 95% CI: 0.34-0.94) meaning that mothers with low education are 0.57 times protected to have wasting

children. This is evidenced by the mean value of WHZ in subjects from highly educated mothers being 0.17 lower compared to subjects with low educated mothers. It showed that a high education level from the mother does not guarantee the children will not experience wasting. It presumed mother with low education in this study were more likely to have unemployment status (88.9%). Furthermore, mothers who do not work have more time to care for their children (14). This study also found that more highly educated mothers were employed compared to low-educated mothers (31.6% vs. 11.1%). In addition, it was found that more highly educated mothers did not breastfeed their children to date compared to less educated mothers (27.7% vs 21.5%).

This study found the subjects with age of 12-23 months were a risk factor for underweight. The subjects aged 12-23 months were at risk of underweight 1.92 times greater than the age group of 6-11 months (AOR=1.92 95% CI: 1.25-2.95). These results are in line with research in Kongo that reported children aged 12-23 months was a risk factor for underweight (AOR=3.29 95% CI: 1.39-7.79) (10).

This study also found the subject who were not have exclusive breastfed became a protective factor against underweight (AOR=0.54 95% CI: 0.35-0.83) meaning that children without exclusive breastfed were protected 0.54 times against underweight incidence. This is evidenced by the mean value of WAZ in children who are exclusively breastfed being 0.35 lower than children who are not exclusively breastfed. This is presumably caused by the subjects already consumed sufficient food that reflected in their food diversity consumption although in minimum category. Most subjects (63.8%) have consumed variety of foods with the average consumption of the food group was 4.94 ± 1.61 . Most subjects who did not receive exclusive breastfeeding consumed a variety of foods (53%). It is also suspected that subjects who received exclusive breastfeeding are given low quality and low quantity of complementary

foods, however was cannot be analyzed in this study. Children with poor nutritional intake are 2.46 times at risk of experiencing underweight (16). This study also found that subjects who were exclusively breastfed consumed more unhealthy snacks compared to subjects who were not exclusively breastfed (63.8% vs 55.4%).

CONCLUSIONS AND RECOMMENDATIONS

Prevalence of stunting, wasting and underweight among children of 6-23 months were 20.5%, 5.7% and 11.6 % respectively. As an accumulation, the risk factor for stunting found in this study were: (a) age 12-23 months (AOR=3.10 CI 95% 2.16-4.45), (b) short birth length (AOR=1.85 CI 95% 1.30-2.62), (c) mother's low education level (AOR=1.97 CI 95% 1.45-2.68), and (d) not breastfeeding (AOR= 0.46 (0.31-0.68). Meanwhile, as the risk factor for wasting was the education level from the mother (AOR=0.5 95% CI 0.34-0.94). The risk factor for underweight was age 12-23 months (OR=1.92 95% CI 1.25 -2.95) and not having exclusive breastfeeding (AOR=0.54 CI 95% 0.35-0.83). Based on this research, intervention programs for improving the nutritional status of women before and during pregnancy require special attention. It is important to encourage pregnant women to have an adequate Antenatal Care (ANC) and mother education intervention regarding parenting feeding patterns which must be carried out in more efficient and effective ways.

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