RISK FACTORS FOR UNDERWEIGHT AMONG CHILDREN AGED 6-59 MONTHS IN INDONESIA

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ABSTRACT

Background: Underweight is a form of malnutrition often associated with increased risk of mortality in children under five years of aged. Underweight is often simultaneously experienced with stunting and wasting. This study aimed to identify risk factors for underweight in children aged 6-59 months in Indonesia.
Subjects and Method: This study was cross-sectional study using Riskesdas data in 2018. The study sample included 47,579 children under five years. The dependent variable was nutritional status. The independent variables included socio-demographic characteristics and illness history. The data were analyzed using logistic regression.
Results: The risk of underweight in children aged 6-59 months increased with age 24-59 months (aOR= 1.84; 95% CI= 1.70 to 1.99; p < 0.001), male (aOR= 1.16; 95% CI= 1.11 to 1.22; p < 0.001), history of tuberculosis (aOR= 1.90; 95% CI= 1.24 to 2.92; p= 0.003), history of diarrhea (aOR= 1.13; 95% CI= 1.05 to 1.21; p < 0.001), birth delivery at home (aOR= 1.56; 95% CI= 1.42 to 1.70; p < 0.001). The risk of underweight in children aged 6-59 months increased with extended family (aOR= 1.19; 95% CI= 1.11 to 1.27; p < 0.001), low maternal education (aOR= 1.34; 95% CI= 1.19 to 1.50; p < 0.001), housewives (aOR = 1.38; 95% CI= 1.18 to 1.62; p < 0.001), unemployed father (aOR= 1.26; 95% CI= 1.09 to 1.45; p= 0.001), mother with a history of underweight (aOR= 1.43; 95% CI= 1.32 to 1.55; p= 0.001), and father with a history of underweight (aOR= 1.51; 95% CI= 1.38 to 1.66; p < 0.001).
Conclusion: The risk of underweight in children aged 6-59 months increases with age 24-59 months, male, history of tuberculosis, history of diarrhea, birth delivery at home, extended family, low maternal education, housewives, unemployed father, mothers with a history of underweight, and fathers with a history of underweight.

Keywords: risk factor, underweight, children underfive.

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BACKGROUND

Underweight is a form of malnutrition in addition to wasting, stunting, vitamin or mineral insufficiency, overweight, obesity and other non-communicable diseases related to diet or consumption. Underweight toddlers are toddlers who are undernourished which causes their weight to be inappropriate for their age (lower than the standard weight for their age). Toddlers who are underweight may also experience stunting, wasting or both. Around 45% of deaths in children under five are related to malnutrition, which mainly occurs in low- and middle-income countries (WHO, 2021). The findings of Myatt et al. (2018) which analyzed data from 2,426 surveys collected from 51 countries between 1992 and 2015 with a total of 1,769.991 children stated that all children who experience stunting and

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wasting simultaneously are also underweight.

The prevalence of underweight children under five in Indonesia in a row starting from 2007, 2010, 2013, and 2018 was 18.4%; 17.9%; 19.6% and 17.7% (Health Research and Development Agency, 2013; Ministry of Health, 2018), so that the nutritional status of children under five is still a major concern, as stated in the 2015-2019 RPJMN National Development Main Goals which state that health-related development targets in points The increasing health and nutritional status of the community targets the prevalence of underweight children to be 17% while the prevalence of stunting in children under five is 28% (Ministry of Health, 2015). In the 2020-2024 RPJMN, nutritional problems in toddlers are also still a target, Human Development Targets and Indicators which include a 19% stunting prevalence target in toddlers and a 7% wasting prevalence in toddlers (Ministry of Health, 2019).

Toddler age is an age that is included in the vulnerable group both related to health and economic and social problems. This is because toddlers are still very dependent on other people, especially the closest family. In addition, the age of toddlers is an age that experiences high growth rates that really need adequate nutrients such as energy, protein, fat, vitamins and minerals. Toddlers who experience a lack of nutrients will cause the risk of decreasing the body's ability to repair cells when exposed to diseases, especially infectious diseases that are susceptible to being suffered by toddlers such as Acute Respiratory Tract Infections (ARI) and diarrhea (Fishman et al., 2004) as also conveyed by UNICEF (2020) that nearly half of deaths in children under five are related to malnutrition, placing children under five at a greater risk of dying from infection, increasing the frequency and severity of these infections and delaying recovery, as also the findings of (Black et al. al., 2008) which states that of under-five deaths worldwide, 19% are related to underweight, 14.5% are related to stunting and 14.6% are related to wasting.

The Riskesdas report provides information regarding the prevalence of underweight children under five but does not analyze the risk factors that cause underweight. This study aims to identify risk factors for underweight in children aged 6-59 months in Indonesia.

SUBJECTS AND METHOD

1. Study Design

This research is a cross-sectional study using Riskesdas data in 2018.

2. Population and Sample

The population and sample are all children under five aged 6-59 months and have complete data. The number of samples analyzed was 47,579 toddlers. Inclusion criteria were children aged 6-59 months and had complete data. While the exclusion criteria are children under five years old 6-59 who have physical disabilities.

3. Study Variables

The dependent variable is nutritional status. The independent variables were characteristics of children under five (age, gender, history of tuberculosis, history of hepatitis, history of diarrhea, history of ARI, administration of vitamin A, place of delivery), household characteristics (region, number of household members, number of

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children under five, access to health centers), access to hospital), and parental characteristics (education of father and mother, occupation of father and mother, smoking habit of father and mother, body mass index (BMI) of father and mother, washing hands with soap (CTPS) father and mother.

4. Operational Definition of Variables

Age is the age of toddlers between 6 to 59 months.

Gender is the gender difference in children under five who are grouped into boys and girls.

History (TB, hepatitis, diarrhea and ARI) is a history of infectious diseases experienced by toddlers related to lung conditions (TB), liver or liver conditions (hepatitis), digestive conditions (diarrhea) and respiratory tract conditions (ARI).

Provision of vitamin A is a government program to provide high-dose vitamin A capsules to toddlers every February and August every year.

Place of delivery is a facility where mothers give birth to toddlers who are sampled (residential houses/other locations that are not health facilities, community health center, independent practice places for health workers, Puskesmas, clinics, public or private hospitals).

Residence is the location where the toddler household lives which is divided into urban and rural areas.

Number of household members is the total number of household members (including toddlers) who live and eat together in the same building which are grouped into 3-4 people, 5 people, 6 people and 7 people or more.

The number of children under five is the total number of children under five who live and eat together in the same building and are grouped into 1 person and more than 1 toddler.

Access to health center is household access to health service facilities in the form of puskesmas which are categorized into easy, difficult, very difficult.

Access to hospitals is household access to health service facilities in the form of hospitals which are categorized into easy, difficult, very difficult.

The education of the parents is the last education level of the parents (father and mother) of the toddler sample which is categorized into not completing elementary, elementary, junior high, high school and university.

The occupation of the parents is the type of work carried out by the parents (father and mother) of the sample toddlers which are categorized into civil servant, private employees, self-employed, school/not working/other, and farmers/fishermen/laborers.

The smoking habit of parents is smoking behavior carried out by the parents (father and mother) of the toddler sample and categorized into never, occasionally and smokes every day.

The parents' body mass index is an assessment of the nutritional status of parents (father and mother) based on weight and height which are categorized into underweight, normal, overweight, and obese.

Parents' hand washing with soap (CTPS) is the habit of washing hands with soap (CTPS) with running water. Parents (father and mother) are categorized into yes (used to wash hands with soap and running water) and no

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(not accustomed to washing hands with soap). soap and running water).

5. Study Instruments

Interviews used two instruments, namely household instruments and individual instruments.

6. Data analysis

Data analysis was carried out in stages, namely univariate, bivariate (chi-square), and multivariate (logistical regression) analysis with the help of SPSS. Variables with $p < 0.25$ in bivariate analysis were included in multivariate analysis.

7. Research Ethics

The implementation of Riskesdas in 2018, has obtained ethical approval from the Health Research Ethics Commission, Health Research and Development Agency of the Indonesian Ministry of Health.

RESULTS

1. Sample Characteristics

The largest age group for underweight toddlers is at the age of 24-59 months (63.0%) with male gender (51.8%) and the most common types of infectious diseases suffered by children under five consecutively are diarrhea (11%), ARI (7.9%), Hepatitis (0.3%) and TB (0.2%) where most children under five had received vitamin A (83.3%) (Table 1).

Table 1. Sample Characteristics

Sample Characteristics	Frequency (N=47,579)	Percentage (%)
Characteristics of toddlers		
Underweight		
No	38,199	80.3
Yes	9,380	19.7
Severe Underweight		
No	45,675	96.0
Yes	1,904	4.0
Child's age (months)		
<12	6,238	13.1
12-23	11,357	23.9
24-59	29,984	63.0
Gender		
Male	24,653	51.8
Female	22,926	48.2
TBC		
No	47,477	99.8
Yes	102	0.2
Hepatitis		
No	47,421	99.7
Yes	158	0.3
Diarrhea		
No	42,332	89.0
Yes	5,247	11.0
ARI		
No	43,816	92.1
Yes	3,763	7.9
Administration of Vitamin A		
Yes	39,633	83.3
No	7,946	16.7
Place of delivery		
Private hospital	6,517	13.7
Clinic	2,357	5.0

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Government Hospital	8,498	17.8
Doctor/midwife practice	11,781	24.7
Health center	9,022	19.0
House/others	9,404	19.8
Household characteristics		
Area		
urban	20,405	42.9
rural	27,174	57.1
Number of household members		
3-4	22,455	47.2
5	11,851	24.9
6	6,821	14.3
≥ 7	6,452	13.6
Number of toddlers		
1	41,415	87.0
> 1	6,164	13.0
Access to Health Center		
Easy	20,101	42.2
Difficult	14,473	30.5
Very difficult	13,005	27.3
Sample Characteristics	**Frequency (N=47,579)**	**Percentage (%)**
Access to Hospital		
Easy	15,809	33.3
Difficult	16,527	34.7
Very difficult	15,243	32.0
Parents Characteristics		
Father's education		
No formal education	4,520	9.5
PS	10,215	21.5
JHS	9,912	20.8
SHS	17,142	36.0
College	5,790	12.2
Mother's education		
No formal education	3,984	8.4
PS	10,103	21.2
JHS	11,085	23.3
SHS	15,648	32.9
College	6,759	14.2
Fathers' occupation		
Civil Servant/Soldier/Police	3,154	6.6
Private employee	6,894	14.5
Entrepreneur	11,481	24.1
Studying/not working/others	3,432	7.2
Farmer/ Fisherman/Labor	22,618	47.5
Mother's Occupation		
Civil Servant/Soldier/Police	2,107	4.4
Private employee	3,130	6.6
Entrepreneur	4,648	9.8
Studying/not working/others	30,458	64.0
Farmer/ Fisherman/Labor	7,236	15.2
Dad's smoking habit		
Never	10,114	21.3
Seldom	5,842	12.3
Smoking every day	31,623	66.5
Mother's smoking habit		
Never	46,727	98.2

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Seldom	543	1.1
Smoking every day	309	0.6
Father's BMI		
Underweight	3,534	7.4
Normal	30,454	64.0
Overweight	11,128	23.4
Obese	2,463	5.2
Mother's BMI		
Underweight	2,713	5.7
Normal	23,018	48.4
Overweight	14,988	31.5
Obese	6,860	14.4
Father CTPS		
Yes	34,573	72.7
No	13,006	27.3
Mother CTPS		
Yes	37,177	78.1
No	10,402	21.9

2. Risk Factors in of Underweight in Children aged 6-59 months

The risk of underweight in children aged 6-59 months increased with age 24-59 months (aOR= 1.84; 95% CI= 1.70 to 1.99; p < 0.001), boys (aOR= 1.16; 95% CI= 1.11 to 1.22; p < 0.001), history of tuberculosis (aOR= 1.90; 95% CI= 1.24 to 2.92; p= 0.003), history of diarrhea (aOR= 1.13; 95% CI= 1.05 to 1.21; p <0.001), delivery at home (aOR= 1.56; 95% CI= 1.42 to 1.70; p < 0.001). The risk of underweight in children aged 6-59 months increased in large families (aOR= 1.19; 95% CI= 1.11 to 1.27; p < 0.001), low maternal education (aOR = 1.34; 95% CI= 1.19 to 1.50; p < 0.001), housewife (aOR= 1.38; 95% CI= 1.18 to 1.62; p <0.001), father not working (aOR= 1.26; 95% CI= 1.09 to 1.45; p= 0.001), mother with a history of underweight (aOR= 1.43; 95% CI= 1.32 to 1.55; p=0.001), and fathers with a history of underweight (aOR= 1.51; 95% CI= 1.38 to 1.66; p < 0.001) (Table 2).

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Table 2. Risk Factors for Underweight in Toddlers 6-59 months in Indonesia

Characteristics	Underweight		Normal+overweight		Unadjusted odds ratio			Adjusted odds ratio		
	n	%	n	%	OR	95%CI	p	aOR	95%CI	p
Characteristics of toddlers										
Toddler age (months)										
<12	836	13.4	5,402	86.8						
12-23	2,257	19.9	9,100	80.1	1.60	1.47-1.74	<0.001	1.65	1.51-1.80	<0.001
24-59	6,287	21.0	23,697	79.0	1.71	1.58-1.85	<0.001	1.84	1.70-1.99	<0.001
Gender										
Male	5,148	20.9	19,505	79.1	1.16	1.11-1.22	<0.001	1.16	1.11-1.22	<0.001
Female	4,232	18.5	18,694	81.5						
TBC										
No	9,353	19.7	38,124	80,3						
Yes	32	31.4	70	68.6	1.86	1.22-2.83	0.004	1.90	1.24-2.92	0.003
Hepatitis										
No	9,342	19.7	38,079	80.3						
Yes	41	25.9	117	74.1	1.42	1.00-2.04	0.050			
Diarrhea										
No	8,212	19.4	34,120	80.6						
Yes	1,165	22.2	4,082	77.8	1.18	1.10-1.27	<0.001	1.13	1.05-1.21	<0.001
ARI										
No	8,632	19.7	35,184	80.3						
Yes	768	20.4	2,995	79.6	1.04	0.96-1.13	0.303			
Administration of Vitamin A										
Yes	7,768	19.6	31,865	80.4						
No	1.597	20,1	6,349	79,9	1.03	0.97-1.09	0.331			
Place of delivery										
Private hospital	860	13.2	5,657	86.8						
Clinic	377	16.0	1,980	84	1.25	1.09-1.43	0.001	1.13	0.99-1.29	0.061
Government Hospital	1,538	18.1	6,960	81.9	1.46	1.33-1.60	<0.001	1.30	1.18-1.43	<0.001
Doctor/midwife	2,179	18.5	9,602	81.5	1.50	1.38-1.63	<0.001	1.23	1.13-1.35	<0.001
Health center	2,102	23.3	6,920	76.7	2.00	1.83-2.18	<0.001	1.54	1.40-1.69	<0.001
House/others	2,323	24.7	7,081	75.3	2.16	1.98-2.35	<0.001	1.56	1.42-1.70	<0.001

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Characteristics	Underweight		Normal+ overweight		Unadjusted odds ratio			Adjusted odds ratio		
	n	%	n	%	OR	95%CI	p	aOR	95%CI	p
Area										
Urban	3,530	17.3	16,875	82.7						
Rural	5,842	21.5	21,332	78.5	1.31	1.25-1.37	<0.001			
Number of household members										
3-4	4,289	19.1	18,166	80.9						
5	2,275	19.2	9,576	80.8	1.01	0.95-1.06	0.731	1.05	0.99-1.11	0.099
6	1,405	20.6	5,416	79.4	1.09	1.02-1.17	0.006	1.12	1.04-1.20	0.001
≥ 7	1,419	22.0	5,033	78	1.19	1.12-1.28	<0.001	1.19	1.11-1.27	<0.001
Number of children										
1	8,076	19.5	33,339	80.5						
> 1	1,319	21.4	4,845	78.6	1.12	1.05-1.20	<0.001			
Access to Health Center										
Easy	3,578	17.8	16,523	82.2						
Difficult	2,952	20.4	11,521	79.6	1.18	1.12-1.25	<0.001			
Very difficult	2,848	21.9	10,157	78.1	1.30	1.23-1.37	<0.001			
Access to Hospital										
Easy	2,656	16.8	13,153	83.2						
Difficult	3,372	20.4	13,155	79.6	1.26	1.20-1.34	<0.001			
Very difficult	3,353	22.0	11,890	78	1.39	1.32-1.47	<0.001			
Father's education										
No formal education	1,189	26.3	3,331	73.7	2.09	1.89-2.30	<0.001			
PS	2,380	23.3	7,835	76.7	1.77	1.63-1.93	<0.001			
JHS	2,032	20.5	7,880	79.5	1.51	1.38-1.65	<0.001			
SHS	2,948	17.2	14,194	82.8	1.21	1.12-1.32	<0.001			
College	845	14.6	4,945	85.4						
Mother's education										
No formal education	1,012	25.4	2,972	74,6	2.17	1.96-2.40	<0.001	1.34	1.19-1.50	<0.001
PS	2,435	24.1	7,668	75.9	2.03	1.86-2.20	<0.001	1.31	1.19-146	<0.001
JHS	2,261	20.4	8,824	79.6	1.64	1.51-1.78	<0.001	1.14	1.04-1.27	0.006
SHS	2,754	17.6	12,894	82.4	1.36	1.26-1.48	<0.001	1.05	0.96-1.15	0.258
College	912	13.5	5,847	86.5						
Father's occupation										
Civil Servant/Soldier/Police	407	12.9	2,747	87.1						
Private employee	1,082	15.7	5,812	84.3	1.26	1.11-1.42	<0.001	1.09	0.96-1.25	0.159

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Characteristics	Underweight		Normal+ overweight		Unadjusted odds ratio			Adjusted odds ratio		
	n	%	n	%	OR	95%CI	p	aOR	95%CI	p
Entrepreneur	2,044	17.8	9,437	82.2	1.46	1.30-1.64	<0.001	1.14	1.00-1.29	0.037
Studying/not working/others	717	20.9	2,715	79.1	1.78	1.56-1.64	<0.001	1.26	1.09-1.45	0.001
Farmer/ Fisherman/Labor	5,134	22.7	17,484	77.3	1.98	1.78-2.21	<0.001	1.21	1.07-1.37	0.002
Mother's occupation										
Civil Servant/Soldier/Police	238	11.3	1,869	88.7						
Private employee	394	12.6	2,736	87.4	1.12	0.95-1.33	0.165	0.98	0.82-1.18	0.858
Entrepreneur	813	17.5	3,835	82.5	1.66	1.42-1.93	<0.001	1.29	1.08-1.53	0.004
Studying/not working/others	6,213	20.4	24,245	79.6	1.99	1.74-2.29	<0.001	1.38	1.18-1.62	<0.001
Farmer/ Fisherman/Labor	1,729	23.9	5,507	76.1	2.46	2.12-2.84	<0.001	1.36	1.15-1.62	<0.001
Father's smoking habit										
Never	1,962	19.4	8,152	80.6						
Seldom	1,122	19.2	4,720	80.8	0.98	0.90-1.07	0.746			
Everyday	6,293	19.9	25,330	80.1	1.03	0.97-1.09	0.259			
Mother's smoking habit										
Never	9,205	19.7	37,522	80.3						
Seldom	108	19.9	435	80.1	1.01	0.81-1.25	0.918			
Everyday	61	19.7	248	80.3	1.00	0.75-1.32	0.990			
Father's BMI										
Underweight	982	27.8	2,552	72.2	1.48	1.36-1.60	<0.001	1.43	1.32-1.55	<0.001
Normal	6,304	20.7	24,150	79.3						
Overweight	1,792	16.1	9,336	83.9	0.73	0.69-0.78	<0.001	0.85	0.80-0.90	<0.001
Obese	310	12.6	2,153	87.4	0.55	0.48-0.62	<0.001	0.68	0.60-0.77	<0.001
Mother's BMI										
Underweight	800	29.5	1,913	70.5	1.53	1.40-1.67	<0.001	1.51	1.38-1.66	<0.001
Normal	4,926	21.4	18,092	78.6						
Overweight	2,623	17.5	12,092	82.5	0.77	0.73-0.82	<0.001	0.79	0.75-0.84	<0.001
Obese	1,036	15.1	5.824	84.9	0.65	0.60-0.70	<0.001	0.67	0.63-0.73	<0.001
Father CTPS										
Yes	6,638	19.2	27,935	80.8						
No	2,757	21.2	10,249	78.8	1.13	1.08-1.19	<0.001			
Mother's CTPS										
Yes	7,138	19.2	30,039	80.8						
No	2,247	21.6	8,155	78.4	1.16	1.10-1.22	<0.001			

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DISCUSSION

The results of the analysis showed that the prevalence of underweight children under five identified several risk factors related to the characteristics of toddlers, namely male toddlers aged > 12 months, suffering from infectious diseases (TB and diarrhea), and not being born in a health facility. The risk factors for underweight related to parents and household are mothers who did not finish elementary school, mothers and fathers who did not work, mothers and fathers who were also underweight, and the number of household members 6 people.

The older the age of a child, the need for nutrients will also increase so that if nutritional intake does not improve, the child will suffer from malnutrition. When the child is < 6 months old, under normal conditions, the nutritional needs will be fulfilled through exclusive breastfeeding and will require additional food at least starting at the age of 6 months, so that if food intake is not sufficient, the higher the age of the child, the more malnourished. Research by Rahman et al. (2021) found that one of the risk factors for underweight experienced by children under five in Bangladesh is the age of the child (> 1 year) and that as the age of the child increases, the likelihood of the child experiencing underweight also increases in children aged 12-23 months, 1.5 times the risk for underweight and Children aged 36 – 47 months are 2.5 times more likely to be underweight (Kumar et al., 2019).

The findings from the analysis of the Demographic Health Survey in Rwanda in 2010 which found that underweight was more at risk for boys (Mukabutera et al., 2016) although the findings (Mak and Tan, 2012) stated that the prevalence of underweight was more common in women. than men in the East Asia region, but in other Asian regions such as in most of South Asia and West Asia, the prevalence of underweight was found to be higher in men than women.

Regarding infectious diseases, diarrhea is one of the most common infectious diseases suffered by toddlers, especially related to sanitation of the environment where toddlers live and personal hygiene of toddlers and caregivers. Diarrhea itself increases the risk of underweight toddlers compared to toddlers who have never had diarrhea (Kumar et al., 2019) and toddlers with severe underweight conditions are more likely to suffer from diarrhea that causes dehydration (Chisti et al., 2007) as well as in the group of children who are underweight. suffering from more infectious diseases found a higher prevalence of underweight (Effendi et al, 2013). In addition, toddlers who are born outside of a health facility have a higher risk of being underweight (Kang and Kim, 2019), especially if the toddler has a low birth weight (LBW) compared to toddlers born in a health facility (Ntenda, 2019).).

Mothers with low levels of education such as not completing primary school are at risk of having underweight children compared to mothers with higher education, as well as findings from (Li et al., 2020) which states that factors related to underweight children are short maternal height, nutritional status mother, low maternal education, father's nutritional

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status and socioeconomic conditions of the family. Low education is generally associated with the ability to read and understand information, especially related to child nutrition and health, in Sigdel et al. (2020) it can be seen that toddlers whose mothers are illiterate are 1.5 times more likely to be underweight than children of mothers who can read, as well as children of mothers who have no income are 5.13 times more likely to be underweight and that fathers from Underweight children work as casual daily laborers such as pedicab drivers, have low education, and come from poor families (Nahar et al., 2010).

From the results of the analysis that has been presented, it is known that the nutritional status of parents, both father and mother, has an influence on the nutritional status of children, where mothers who are at greater risk of having underweight children are mothers who have less nutritional status with a BMI < 18.5 compared to mothers who have a BMI. between 18.5 and 24.9 (Nahar et al., 2010; Mukabutera et al., 2016) In addition, stunting and underweight in children under five are associated with parents who are also underweight or have short stature (Rachmi et al., 2016).

The number of household members is closely related to the economic capacity of the family, the more members in a household, the greater the cost to meet their daily needs, including those related to nutrition and health, such as nutritious food intake and medical expenses. The findings from this analysis are that children under five from households that have many household members (≥7 people) are at 1.19 times at risk of being underweight and the findings from (Capanzana et al., 2018) that family size affects the child's underweight condition and that in children Under two years of age, the risk of being underweight is 20 times higher if you come from a family with more than 7 household members compared to a family with less than 5 household members (Nurhayati et al, 2004).

The limitation of this study is that the data used are secondary data from a cross-sectional study so that the analysis is only carried out based on the variables available in the study and the number of samples is also limited to toddlers who have complete data/ variables to be analyzed. In this regard, it is impossible to determine the main factors causing underweight in children under five, although theoretically the above factors are listed in various sources of information in addition to other factors not included in the study variables, such as food availability at the household level.

The nutritional status of children under five is still a development priority both in the world and in Indonesia, with underweight as the easiest indicator of nutritional status to measure because it is only based on weight for age. The increase in age in toddlers shows the need for nutritional intake is also increasing, as well as the gender factor because different sexes require different nutritional needs. Increased knowledge and education of parents of toddlers is also needed to improve the nutritional, health and economic conditions of toddlers and their families. Policies such as the First

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1000 Days of Life (1000 HPK) need to be encouraged, including for young women, as a preparation for prospective mothers to obtain information about nutrition and health for themselves and their future children.

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AUTHOR CONTRIBUTION

Irlina is responsible for drafting articles, analyzing data and writing manuscripts. Sudikno assisted in data analysis, writing manuscripts and reviewing manuscripts. Aditianti wrote the manuscript. All authors made improvements and approved the final manuscript.

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CONFLICT OF INTEREST

The author declares that there is no conflict of interest in this study.

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