



Analysis of Stunting Phenomenon in Sragen Regency During The COVID-19 Pandemic from Economic Perspective

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ABSTRACT

The COVID-19 pandemic has hit all countries in the world including Indonesia. To prevent the spread of the virus, the PSBB and PPKM policies have been implemented and these policies have crippled economic activities which have an economy impact and food security. The purpose of this study was to analyze the effect of economic and food security during the COVID-19 pandemic on toddler stunting status including 1) knowing the relation of economy on food security, 2) knowing the effect of economic and food security. on toddler stunting. This research is an observational study with a cross-sectional design. The data in this study were data on children under five years old years old, family economic status, and family food security status. The population of this study was toddlers aged 0-5 in Sragen Regency in 2020. The sampling technique is cluster sampling. Data analysis used the Spearman correlation technique and binary logistic regression. The results of the study are 1) Economic status is related to food security ($r = 0.637$, $p\text{-value} = 0.000$), 2) Economic status affects stunting of children under five years old years old ($B = 1.460$; $p\text{-value} = 0.006$; $OR = 4,307$), 3) Food security affects the stunting of children under five years old years old ($B = 5.028$; $p\text{-value} = 0.000$; $OR=152,660$). Economic and food security affect toddler stunting in Sragen Regency during the COVID-19 pandemic. The incidence of stunting is still common in Indonesia, further research can be carried out to analyze other factors that influence stunting according to the conditions of the toddler area.

INTRODUCTION

Corona Virus Disease 19 (COVID-19) has spread to more than 122 countries including Indonesia. To deal with this problem, the government has implemented policies namely substantive policy (prevention) while focusing on Policy for economic growth.¹

The pandemic caused by Corona virus does not only threaten public health but also social condition and economic growth. In particular, the economy of the underprivileged which supported by daily income is really affected.^{2,3,4} This has resulted in a sluggish economic condition of the community.

Currently, in addition to face the COVID-19 pandemic, the Indonesian government also still solve the stunting problem which is feared to be even worse due to Covid-19. The COVID-19 pandemic makes it possible for the number of stunting children (chronic malnutrition) in Indonesia to increase. It is predicted that the Stunting Reduction target until 14 will be difficult to achieve, considering that the integrated healthcare center known as Posyandu is no longer operating and health workers at the public health center (*Puskesmas*) are also not immune from the impact of COVID-19. In Indonesia, the policy on restricting social activities also impacts access to consumption, nutrition services, and routine health services for children.⁵

Before the pandemic occurred, Indonesia had already faced Malnutrition Problem, it was recorded that Indonesia was in the third position with the highest prevalence of stunting in the Southeast Asia Area. UNICEF predicts that there will be an increase in stunting children considering that many households in Indonesia have lost their economic income. The results of the Indonesian Toddler Nutrition Status Survey (*Survei Status Gizi Balita Indonesia*) in 2019 have shown that the prevalence of stunting has reached 27.67 percent. This means that for every ten children, 3 of them are stunted. This figure is also still above the World Health Organization (WHO) requirement, which is 20 percent.⁶

Several factors that influence the incidence of stunting under five years old are economic factors and food security.^{7,8} Family economic status is the ability of family to fulfill the financial needs of all family members.⁹ Food security is measured from the economic aspect

based on food expenditure and measured from the nutritional aspect based on the fulfillment of adequate food consumption in energy units.¹⁰

The percentage of stunting in the Sragen Regency based on data from the Sragen District Health Office in 2020 has actually decreased which is in 2019 by 12.65% to 8.15% in 2020. However, based on the top 20 stunting data, there are several villages in the Sragen Regency that still have a percentage above 20, exceeding the availability of the WHO and expectations of the Indonesian government which targets the stunting rate to be below 14. Based on the description above, this study analyzes the influence of family economic status and food security status on the incidence of stunting under five years old in the Sragen Regency during the COVID-19 pandemic.

MATERIAL AND METHOD

This research is an observational study with a cross-sectional design. The research was conducted in Sragen Regency between April-August 2021. The population in this study was 56,034 toddlers aged 0-5 years recorded in the work area of the public health center in Sragen Regency. The sample size determination was calculated using the WHO sample size application and the minimum sample was 382. Samples were taken in 5 villages located in 3 sub-districts. The five villages are Pengkol Village and Kecik Village located in Tanon District, Geneng Village and Jeruk Village located in Miri District, and Jetak Village located in Sidoharjo District. The sampling technique is cluster random sampling.

The data used in this study are data of children under five years old, family economic status and family food security. The Data of toddlers are used to determine Stunting status of toddlers which is calculated using the WHO Anthro application. Data for toddlers includes gender, age, weight, height, arm circumference, and head circumference. The tools used to measure body weight are toddler scales and digital scales. Meanwhile, the measuring tools used to measure height are infant ruler, height meter, and measuring tape. The criteria for classifying stunted toddlers are if the height below -2 SD from the Z score based on the TB/U or BB/U index. Family economic data and food security status were obtained by giving questionnaires to parents of children under five years old. Before the ques-

tionnaire was given to respondents as a research sample, it is necessary to test the validity and reliability of the question items in the questionnaire. The validity and reliability test of the questionnaire was conducted on 30 respondents. The results are presented in Table 1. Based on the test results, all questions in the questionnaire are valid (the correlation test value is significant or $p\text{-value} < 0,05$) and reliable or valid (Conbrach Alpha test > 0.7). After obtaining the validity and reliability test, the questionnaire was given to 400 respondents. from the 400 questionnaires given to the respondents, only 387 were filled out completely. Therefore, for further data analysis, 387 data were used. Data were analyzed using Spearman correlation and binary logistic regression techniques. The results of the binary logistic regression test were said to be significant if the $p\text{-value} < 0.05$. This research has received permission from the Ethics Committee of Politeknik Indonusa Surakarta Number 0671/DIII/INDO/VIII/2021.

RESULTS

The data from the results of research that have been carried out are summarized and shown in Table 2. Based on the summary data, it can be seen that the incidence of under-five stunting occurs mostly at the moderate level of education of the father (83.80%), the mother's

education level is low (62.20%), the father's occupation private employees (37.80%), mother status is employed (85.10%), family income around 1.5 million – 3 million (48.60%), number of family members more than 4 (73%), low monthly food expenditure (78.40%), less food variety (91.90%), less food supply (100%), low family economy (60.880%), and low family food security (95.90%).

Furthermore, the Spearman correlation test was conducted between family economic status and family food security status with stunting status of children under five years old to determine the relation between these variables. The results of Spearman correlation test are presented in Table 3. The results of the Spearman correlation test showed that the family economic status and family food security status correlates with the stunting status of children under five years old ($r = 0,543$ and $p\text{-value} = 0.005$; $r = 0,701$ and $0,000$). Family economic status also shows a correlation with family food security status ($r = 0,637$ and $p\text{-value} = 0,000$).

As these variables show a significant correlation with the status of stunted toddlers, these can be included in a binary logistic regression test to determine their effect on stunted toddlers. The results of the binary logistic regression test are presented in Table 4.

DISCUSSION

Based on the results of the Spearman correlation test shows that economic status is related to food security. Economic status has an important factor in the status of food security. This study's family economic status was based on the father's education, mother's education, father's occupation, mother's status, family income, and the number of families. Education, occupation, family income, number of families are variables that determine family food security.¹¹

Economic hardship and low income affect household accessibility to food and thus affect daily eating patterns. A high economic status will ensure that the purchasing power of food is also high so that there are sufficient food reserves in the family. During the COVID-19 pandemic to ensure food security, the Indonesian government assisted families with low economic status. Through the *BLT (Bantuan Langsung Tunai)*,

Table 1. Results of the Validity and Reliability of Questionnaire

Questionnaire	Validity Test Results		Reliability Test Results
	r	p-value	
Family Economic Status			
Father's Education	0.786	0.000	
Mother's Education	0.742	0.000	
Father's Occupation	0.788	0.000	0.702
Mother Status	0.524	0.003	
Family Income	0.871	0.000	
Number of Family Members	0.395	0.031	
Family Food Security			
Family Food Expenses	0.698	0.000	0.735
Food Variety	0.900	0.000	
Family Food Reserves	0.917	0.000	

Source: Primary Data, 2021

Raskin (*Beras Miskin*), PKH (*Program Keluarga Harapan*), MSME assistance, pre-employment, BSU (*Bantuan Subsidi Upah*) programs. It is ex-

pected to overcome food insecurity so that food security is maintained.

Tabel 2. The Results of The Respondents' Questionnaire Regarding Father and Mother's Education, Father's and Mother's Occupation, Family's Income, The Number of Family Members, Food Expenditure, Food Variety, Food Supply, Family Economic Status, and Family Food Security Status

Variable	Stunting Status of Toddlers			
	Stunted		Not Stunted	
	n = 74	%	n = 313	%
Father's Education				
Low (Primary to Secondary School)	12	16.2	10	3.2
Middle (High School)	62	83.8	256	81.8
High (Diploma - Bachelor)	0	0	47	15
Mother's Education				
Low (Primary to Secondary School)	46	62.2	16	5
Middle (High School)	28	37.8	267	85
High (Diploma - Bachelor)	0	0	30	10
Father's Occupation				
Unemployed	4	5.4	0	0
Laborer	25	33.8	9	2.9
Farmer/Breeder/Business	9	12.2	85	27.2
Private Employees	28	37.8	49	15.7
Police/Soldier	4	5.4	77	24.6
Teacher	4	5.4	63	20.2
Public Employees	0	0	7	2.2
Teacher	0	0	5	1.6
Civil Servant	0	0	18	5.8
Mother's Occupation				
Employed	63	85.1	90	28.8
Unemployed	11	14.9	223	71.2
Family's Income/Month				
< 1,5 million	35	47.3	9	2.9
1,5 million - 3 million	36	48.6	80	25.6
3 million - 5 million	3	4.1	184	58.8
5 million - 7 million	0	0	30	9.6
> 7 million	0	0	10	3.2
The Number of Family Members				
> 4	20	27	74	23.6
≤ 4	54	73	239	76.4
Food Expenditure/Month				
< 1 million (Less)	58	78.4	11	3.5
1-3 million (Moderate)	16	21.6	218	69.7
> 3 million (Large)	0	0	84	26.8
Food Variety				
Less	68	91.9	18	5.8
Medium	6	8.1	114	36.4
Many	0	0	181	57.8
Food Supply				
Less	74	100	146	46.6
Adequate	0	0	121	38.7
Many	0	0	46	14.7
Family Economic Status				
Low	45	60.8	13	4.2
Middle	29	39.2	248	79.2
High	0	0	52	16.6
Family Food Security Status				
Low	71	95.9	19	6.1
Middle	3	4.1	225	71.9
High	0	0	69	22

Source: Primary Data, 2021

The binary logistic regression test results showed that the family's economic status affected the stunting status of children under five years old ($p\text{-value} < 0.05$). The odds ratio is 4.307. This means that families with high family economic status will increase the number of children under five years old who are not stunted 4,307 times. This means that a high family economic status can prevent stunting in children under five years old.

The results of this study are the same as the results of previous studies. Income and education affect the incidence of stunting in children under five years old in Kuala Tambang Village, Kampar,⁸ and the incidence of stunting in children under five years old in Teluk Betung sub-district, Bandar Lampung City.¹²

The status of family food security also affects the stunting status of children under five years old ($p\text{-value} < 0.05$). The odds ratio is 152,660. This means that families with high food security status will increase the number of children under five years old who are not stunted by 152,660 times. It can be interpreted that a high food security status can prevent stunting under five years old.

The results of research that have been carried out show good results. Food security will result in food insecurity and this will result in stunting for children.¹³ Food security is also related to the incidence of stunting under five years old in Teluk Betung sub-district, Bandar Lampung City.¹² Food security is also associated with events in Rwanda.⁷ Food security can help reduce child malnutrition that affects stunting in the iLembe district of South Africa's KwaZulu-Natal province.¹⁴

The incidence of stunting under five years old in this study mostly occurred in families with low economic status about 60.80% and medium economic status about 39.20%. There are no children under five years old who experience stunting for high economic status. High family

economic status can fulfill family needs, especially family nutrition. During the COVID-19 pandemic, many family economies were disrupted, especially if the family's livelihood depended on the daily income, such as pedicab drivers, traders and day laborers. In addition, many industrial workers during the COVID-19 pandemic have been laid off.

This affects the decline of family income.¹⁵ Loss of household income creates a high risk for a spike in malnutrition and micronutrient deficiencies between toddlers and children.¹⁶ If this condition occurs continuously, it will decrease family income, which can cause stunting under-fives to increase.¹² Because the family does not longer pay attention to the nutritional needs of the family.

The most important thing is that the family's food needs are fulfilled according to their purchasing power. This means that economic status factors can affect the occurrence of stunting in children under five years old. This incident also occurred in Bangladesh where children under 24 months were stunted due to economic factors.¹⁷ Economic factors based on wealth index are also associated with stunting in Ethiopia.¹⁸

Good family food security will provide sufficient family food needs. In this study, the incidence of stunting in children under five years old mostly occurred in low family food security status 95.90%, and food security status for middle families was 3.10%. Meanwhile, families with high food security status do not have children under five years old who experience stunting.

Table 3. The Results of Spearman Correlation Test

Variable	Family Food Security	Toddler Stunting Status
Family Economic Status	$r = 0.637$ $p\text{-value} = 0.000$	$r = 0.543$ $p\text{-value} = 0.000$
Family Food Security Status		$r = 0.701$ $p\text{-value} = 0.000$

Source: Primary Data, 2021

Table 4. The Results of Binary Logistics Regression Test

Variable	B	$p\text{-value}$	OR	95% CI	
				Lower	Upper
Family Economic Status	1.460	0.006	4.307	1.517	12.227
Family Food Security Status	5.028	0.000	152.660	42.476	548.668
Constants	-8.608	0.000	0.000		

Source: Primary Data, 2021

Toddlers who did not experience stunting in this study were mostly in families with medium food security status about 71.90%, and high food security status about 22.00%. Only a small proportion of children under five years old about 6.10% are in families with low food security who do not experience stunting. Toddlers in families with high food security status will influence the fulfillment of energy and good nutritional intake.

A balanced and varied composition of nutritious food, both quality and quantity will support the growth and development of toddlers so that toddlers will avoid stunting. During the COVID-19 pandemic and the implementation of *PPKM (Pemberlakuan Pembatasan Kegiatan Masyarakat)*, it can result in uneven distribution of food. The existence of an unequal distribution of food can cause food prices to rise due to reduced food supplies create food insecurity.^{16,19}

The high demand for food that is not matched by a large food supply also makes food prices expensive so the purchasing power goes down. This can lead to a decrease in the quality and quantity of family nutritional intake.

The decrease in nutritional intake that occurs in toddlers can interfere with the growth and development of toddlers and make toddlers stunted. This means that family food security is a factor that can cause toddlers to experience stunting.^{14,12} To improve food security during the COVID-19 pandemic, it can be done through financial and nutritional assistance programs.^{19,20}

CONCLUSION AND RECOMMENDATION

During the COVID-19 pandemic, family economic status and family food security status affected the incidence of stunting. Toddlers will experience stunting if the family's economic status is low and food security is low. So that toddlers do not experience stunting, it is necessary to have assistance from various parties to help families with low economic status. So that families with low economic status can still fulfill the family's food needs and can provide nutritious food for toddlers. Based on the results of the study, the incidence of stunting under five years old was found in families with low economic status and low family food security, it was also found in families with low maternal education and mothers who did not work. Therefore, it is

necessary to empower mothers who do not work to do farming techniques by utilizing the land around the house. This program can not only maintain family food security, it can also increase the family's economic income. Counseling on nutrition for toddlers also needs to be done considering that many mothers have low education.

There are many factors that influence the occurrence of stunting in toddlers, for further research, a more in-depth analysis can be carried out on the factors that influence the occurrence of stunting based on the condition of the area where the toddlers are located. Because the factors in each region that influence the occurrence of stunting can be different. By knowing the factors that can cause stunting in detail, it is hoped that it can help to prevent and reduce the incidence of stunting in toddlers.

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AUTHOR CONTRIBUTIONS

This study's contributions are as follows: author 1 composes and designs research and makes research articles. Author 2 takes care of legal licensing. Authors 1 and 2 collected data and analyzed the data.

CONFLICTS OF INTEREST

The author declares there is no conflict of interest. This study is only to find out whether economic conditions and food security during the COVID-19 pandemic affect the incidence of stunting in toddlers.

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