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Family Vulnerability and Children' Nutritional Status during COVID-19 Pandemic

A. Mukramin Yusuf[1*], Dhihram Tenrisau[2], Healthy Hidayanti[3], Abdul Haris Ibrahim[4], Ardiansyah Bahar[5], Sarifudin[5], Yoesrianto Tahir[5], Adhyanti[6], Elma Alfiah[1]

[1]Nutrition Study Program, Universitas Al-Azhar Indonesia, Jakarta, Indonesia
[2]Epidemiology Master Program, Epidemiology Department, Faculty of Public Health, Universitas Indonesia, Depok, Indonesia
[3]Nutrition Science Departement, Public Health Faculty, Hasanuddin University, Makassar, Indonesia
[4]Departmenet of Health Informatics, School of Information and School of Public Health, University of Michigan
[5]Health Development and Policy Institute (LK2PK), Indonesia
[6]Health Polytechnic of Palu, Palu, Indonesia
*Corresponding Author. Email: amukraminyusuf@gmail.com

Abstract

Introduction: COVID-19 infected millions of people and became the main mortality worldwide. COVID-19 also affected other health problems, including nutritional problems. This study aimed to find the factors that affected the nutritional and socio-economic status during the COVID-19 pandemic in a neighborhood of DKI Jakarta.

Methods: This study utilized a cross-sectional design. Total sampling method on all families who had children in the 9th Neighborhood, Cawang Sub-District, DKI Jakarta was used. A total of 72 families were involved in this study, and the informants of this study were mothers of under five children. This study utilized a modified questionnaire from the Indonesian National Socio-Economic Survey (Susenas) and the Indonesian Nutritional Status Study (SSGI). This study utilized bivariate and multivariate logistic regression analysis.

Results: From all of 72 families with children, it was found that eight children were wasting. The Job-Loss (*PHK*) has an OR of 37.8 (95%CI: 5.87-748.53; p=0.001), while below poverty line had an OR of 14.24 (95%CI: 3.55-170.35; p=0.004) to be wasted. The multivariate analysis had included covariates such as parental occupation, parental education, and *antenatal care* (ANC). Job-Loss and Below Poverty Line were the main factors in increasing the risk of malnutrition cases after controlled by covariates.

Conclusion: The decrease in socio-economic status of a family during the pandemic, increased the risk of wasted children. Improvements in policy interventions and socio-economic aids are necessary to improve the nutritional status of under five children in the lower-middle class during the COVID-19 pandemic.

Keywords: nutritional status, nutrition, job loss, poverty line, COVID-19, wasting

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Introduction

COVID-19 infected millions of people worldwide.[1] The COVID-19 pandemic also affected other health problems related to nutrition. The Food Policy Research Institute suggests that the pandemic will result in 140 million people living in poverty on less than US$1.90 per

day (approximately IDR 27,000.00) by 2020. According to the World Food Program (WFP), the number of people in low-income and middle-income countries (LMIC) facing food insecurity have doubled to 265 million people by the end of 2020.[2]

Similarly, the findings showed that Indonesia's poverty rate increased more during the pandemic compared to the pre-pandemic era (in September 2019). Households found several ways to meet their daily needs, including establishing a homemade industry or reducing expenses. Socio-economics programs can reduce the burden on households during the crisis due to the COVID-19 pandemic.[3]

UNICEF simulated and predicted the children that will be impacted by the rise of poverty during the COVID-19 pandemic in Indonesia, especially in 2021.[4] However, further research is necessary for the different populations with larger samples and other more measurable variables.

Therefore, this study was done to analyze the factors that influence the children's nutritional status during the COVID-19 pandemic in the Cawang Sub-District, DKI Jakarta. The location of this research was chosen based on the criteria that represent the conditions and characteristics of the urban community, besides that it is also adjacent to the location of the community assisted by the research team. It also aimed to support the policies for preventing family nutrition problems in the Sub-District during the COVID-19 pandemic.

Methods

This study was a cross-sectional study with the total sampling method from all of the families who had under five children in the 9th Neighborhood, Cawang Sub-District, DKI Jakarta. A total of 72 families were involved in this study, where the informants of this study were under five children' mothers.

This study used the modified Indonesian National Socio-Economic Survey (Susenas) and the Indonesian Nutritional Status Study (SSGI) questionnaires. These questionnaires had been used by the government in assessing the socio-economic conditions of the Indonesian people, which are quite sensitive, such as income, food security status, access to clean water, as well as the nutritional status of the community. The questionnaires were modified for the research needs and contexts. The measure of family income is based on the DKI Jakarta minimum wage standard monthly (IDR 4.2 million /US$293.31).[5] Meanwhile, for the poverty indicator, using the criteria by the Central Statistics Agency (BPS). In 2020 and 2021, the average income categorized Below Poverty Line of a family was IDR 680 thousand/US$46.79 monthly.[6] The Job-Loss was categorized for the household that experienced the loss of job during the COVID-19 pandemic in Indonesia (from March 2020-February 2021).

The outcome variables were wasted (z-score -3 SD - <-2 SD) and normal (z-score -2 SD - +1 SD) children. The classification of nutritional status assessment was based on the 2020 Ministry of Health Anthropometric Index which referred to the WHO Child Growth Standards for 0-5 years old children. Nutritional status or BMI was determined based on indicators of weight-body length (BB/PB) or weight-height (BB/TB).[7] The enumerators of the study were the volunteers of Integrated Healthcare Centre (*Posyandu*) of 9th Neighborhood, Cawang Sub-District, DKI Jakarta, who were trained by the research team. This research was conducted on 5-20 February 2021.

Statistical Analysis

Firstly, the descriptive analysis was done. Afterward, this study extracted the distribution and tabulation for each variable. The ordinal logistic regression between wasted status and poverty status with Job-Loss was conducted. Those variables were combined to the covariates of family income, water source, father and mother's occupation, father and mother's education, gender, *antenatal care* (ANC), child's age, and beastfeeding status; using the following formula: [8]

$$\pi = \frac{1}{1 + e^{-(Xb)}}$$

This bivariate model was examined for the Odds Ratio (OR) and the size of its statistical significance ($p<0.05$). Furthermore, the multivariate model of this study used the backward method to exclude covariates that were not statistically significant or considered confounders in the modeling. The final model was analyzed for significance and the Goodness of Fit model was tested. All statistical analyses in this study used software R version 4.1.3.

Results

It was found that eight children from all families were wasted. A total of 63 families experienced Job-Loss during the pandemic, where seven of them had a wasting child. The Job-Loss was the variable with the largest OR (37.8). Meanwhile, it was found that five families in 9th Neighborhood, Cawang Sub-District were Below Poverty Line. This variable also resulted in high OR (14.24) from the entire population.

Furthermore, the ANC contributed 33.08 in OR which eight mothers did not complete ANC visits (four times). Families whose fathers did not work, resulted in 21 times higher risk to be wasted. In fact, there were two families with unemployment, reported having wasted children.

Source of consumed water was also found to have a relationship with the child wasting. Bottled Drinking Water consumption had a significant relationship with the incidence of wasted (OR = 0.002).

Education also became a covariate that affects the incidence of wasted. In the bivariate analysis, children whose parents did not complete primary school tended to had a higher risk for wasting (OR = 18.6, p = 0.004). In this study it was reported that 3 out of five children with parents who did not graduate from elementary school had a wasting child in their family.

Several variables also showed almost similar results, such as in the group of families with income less than the minimum wage (<IDR 4.2 million). The families who did not experience diarrhea in the last two months, the families without savings, the families who had under five years old children (1-4.9 years), and others. This was probably due to the homogeneity of the sample characteristics, followed by the small number of samples.

Table 1. Descriptive Analysis and Bivariate

Variables	All		Wasted		Bivariate		
	Total	%Total	Wasted	%Wasted	OR	(95%CI)	*p*
Socio-Economic Criteria							
Job-Loss During Pandemic							
Yes	8	11.11	7	9.72	37.8	5.87 – 748.53	**0.001***
No	64	76.39	1	1.39	0.02	0.001-0.17	
Poverty Status							
Non-Below Poverty Line	67	93.05	5	6.94	0.053	0.005-3.91	**0.004***
Below Poverty Line	5	6.94	3	4.17	14.24	3.55-170.35	
Family Income per Month							
<IDR 4,2 Million	52	72.22	8	11.11			
>IDR 4,2 Million	20	27.78	0	0			
Water Source							
Bottled Drinking Water	64	88.89	1	1.39	0.002	0.00-0.02	**0.000***
Tap Water	1	1.39	0	0			
Well Water	7	9.72	7	9.72			0.995

* statistical significance ($p < 0.05$)

Table 1. Descriptive Analysis and Bivariate (Continued)

Father's Occupation							
Day Labour	4	5.56	0	0			
Private Sector	40	55.56	3	4.17	0.43	0.08-1.93	0.28
Government Sector	2	2.78	0	0			
Unemployed	3	4.17	2	2.78	21	1.77-493	**0.0189***
Micro-Enterpreneur	23	31.94	3	4.17	1.32	0.25-5.92	0.721
Mother's Occupation							
Private Sector	11	15.28	0	0			
Government Sector	1	1.39	0	0			
Unemployed	58	80.56	6	8.33	0.69	1.14-5.11	0.675
Micro-Enterpreneur	2	2.78	2	2.78			
Parental Education							
Not Graduating Elementary School	5	6.94	3	4.17	18.6	2.55-170.32	**0.004***
Junior High School Graduates	4	5.56	1	1.39	2.9	0.133-26.56	0.383
Senior High School Graduates	46	63.89	4	5.56	0.52	0.113-2.4	0.391
College Graduates	17	23.61	0	0			
Family Savings							
Have	30	41.67	0	0			
Not Have	42	58.33	8	11.1			
Clinical and Children Criteria							
Gender							
Man	34	47.22	5	6.94	2.71	0.45-10.48	0.365
Woman	38	52.78	3	4.17	0.49	0.09-2.2	
Diarrhea in Last Two Month							
Present	0	0	0	0			
Not Present	72	100	8	11.1			
ANC Visits							
Complete	64	88.89	3	4.17	0.08	0.01-0.53	**0.007***
Uncomplete/Never	8	11.11	3	4.17	12.2	1.86-84.03	
Child's Age							
<12 months	6	8.33	0	0			
1-4,9 years	66	91.67	8	11.1			
Breastfeeding							
Yes	63	87.5	6	8.33	2.72	0.35-14.77	0.272
No	9	12.5	2	2.78	0.37	0.06-2.83	

* statistical significance ($p < 0.05$)

Multivariate Analysis

In this study, two models were found with the best Goodness of Fit results. The first model is the Job-Loss as the main independent variable, afterwards, it was occupation and the ANC visits. The Job-Loss factor had a higher OR than the poverty status in the second model. In the controlled by the covariates: parental education and ANC visits. Meanwhile, the second model with the main independent variable, the poverty status of the family, subsequently was controlled by the father's second model, ANC visits had an OR greater than the main independent factor.

Table 2. Multivariate Analysis

Variables	Model 1			Model 2		
	AOR	(95%CI)	*p*	AOR	(95%CI)	*p*
Job loss During Pandemic						
Yes	25.87	2.95-671.95	0.01*			
No	0.04	0.00-0.33				
Poverty Status						
Non-Below Poverty Line				0.04	0.06-6.7	**0.01***
Below Poverty Line				23.29	1.72-342.98	
Parental Education						
Not Graduating Elementary School	18.26	1.31-556.32	0.05*			
Junior High School Graduates	6.74	0.18-247.38	0.25			
Senior High School Graduates	0.176	0.01-1.31	0.11			
College Graduates						
Father's Occupation						
Day Labour						
Private Sector				0.76	0.1-5.7	0.78
Government Sector						
Unemployed				10.43	0.34-427.69	0.18
Micro-Enterpreneur				5.6	0.57-128	0.16
ANC Visits						
Complete	0.3	0.02-3.12	0.4	0.03	0.00-0.24	**<0.001***
Uncomplete/Never	3.31	0.32-36.99		33.08	4.03-365.38	

* statistical significance ($p < 0.05$)

Discussion

The COVID-19 pandemic has implications for many socio-economic vulnerabilities.[9, 10, 11] In Turkey and Saudi Arabia, it was reported that the children' diet and nutritional intake were changed during the COVID-19 pandemic. [12]

The findings related to the family food security in this era were also found in several countries. Many of the studies reported the food vulnerability and hunger such as in the United States, Nepal, Jordan, and Pakistan. [13, 14, 15, 16] In fact, in urban areas of Sri Lanka, it was reported that there was an increase in wasting and obesity during the COVID-19 pandemic.[17]

Food insecurity was theoretically related to the limitation in accessing food sources. This access limitation was due to poverty and low family income.[18] In Indonesia, food vulnerability is one of the factors that impact the incidence of stunting, in addition to low awareness of reproductive health, low attention to children, parental education, and sanitation and clean water accessibility.[19, 20] In this study, the factors those mentions before

were still relevant and statistically significant in this study.

This COVID-19 also had implications for food insecurity, especially for lower-middle class families.[21] In Indonesia, food vulnerability in the lower-middle class also occurred, along with the increase in the numbers of unemployment until August 2020. In urban areas, especially DKI Jakarta, it was found that about 10.95 percent of the population was unemployed and had job losses in August 2020. This phenomenon also occurred worldwide. [22, 23, 24]

This unemployment was also experienced by three heads of families (fathers) in the 9th Neighborhood, Cawang Sub-District, DKI Jakarta. Two of the three families had under-five children who were malnourished. Another one who experienced the job-loss also occurred in 9th Neighborhood families. Out of a total of eight families who experienced Job-Loss, seven of them had under-five children who were malnourished.

Job-Loss had a significant relationship to food vulnerability, especially in the COVID-19 pandemic era. Studies in the United States on lower-middle-class families showed a significant correlation. [25] Other research showed how Job-Loss has a great impact on family consumption patterns.[26] Studies in several countries even show how significant was the risk of stunting in the Job-Loss families. [27, 28]

Other factors such as breastfeeding which theoretically increase the growth and development of children, in this study were inverted. The mothers of household subjects who breastfed their children were at risk of having child wasting compared to the mothers who did not breastfeed their children.[29] When it is associated with socio-economic conditions, this can be caused by several factors, for example, the consumption of unhealthy food, the presence of infectious diseases and poor sanitation.

The experts have warned about this food vulnerability during pandemic era where they suggest the socio-economic supports and policies preventing food vulnerability and anticipating hunger in the community. [30, 31, 32] In fact, the government of Indonesia has implemented the Social Aid (*Bansos*) policy, especially for the lower-middle class households.[33]

However, the aid was corrupted and there was a lack of monitoring in implementation, especially for children and children nutrition assistance in DKI Jakarta.[34, 35] It was also worsened by the inactivity of the *Posyandu* at The 9th Neighborhood, Cawang Sub-District, DKI Jakarta, during the pandemic. Actually, *Posyandu* activities aimed to monitor the growth and nutritional status of the children, provide consultation for mother and children and also prevent children growth faltering. [36]

Therefore, it is necessary to improve the monitoring and evaluation of the social aid, and also provide community empowerment for the households who were in Below Poverty Line. Furthermore, *Posyandu* should be reactivated and provided by empowerment interventions for families who experienced Job-Loss and are categorized as families at Below Poverty Line.

Conclusions

Job-Loss and Below Poverty Line of the family during pandemic had the higher risk for wasting, along with other variables in the family for instance: water sources, parents' occupations, parents' education, and ANC status in the 9th Neighborhood, Cawang Sub-District, DKI Jakarta. It is recommended to improve the policy for interventions and socio-economic assistance in order to increase the nutritional status of under five children in the lower-middle class during COVID-19 pandemic. Finally, further research with a larger sample size, in different populations, as well as adding some more variables to enrich the research results is important.

Ethics approval

Ethics were approved by The Research Ethic Committee, Faculty of Dentistry, Universitas Jember (No.1402/UN25.8/KEPK/DL/2021).

Availability of data and materials

The analysis and highlight of the data in this research are available on https://dhihram.github.io/JPHTCR_lk2pk_s

tunting/ and https://github.com/Dhihram/JPHTCR_lk2pk_stunting

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Author Contribution
All of authors gave the equal contribution

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