
RELATIONSHIP BETWEEN HOUSEHOLD FOOD SECURITY AND UNDER-FIVES HEALTH

Mayang Rizqia Dinatingtyas¹, Diah Widyawati²

Universitas Indonesia, Jakarta, Indonesia

mayang.rizqia01@ui.ac.id

ABSTRACT

Food insecurity is a global issue and its alleviation is stipulated in the 2030 SDGs target 2.1, namely zero hunger and achieving food security for all people. Food insecurity can affect health physically, mentally, socially, and quality of life directly or indirectly due to malnutrition. This study aims to identify the relationship between the level of food insecurity and the health of children under five using an order logit regression model from the March 2021 Susenas data. This study used March 2021 Susenas data from the Central Bureau of Statistics (BPS). The data used in this study is cross-sectional data at the individual level. The results show that food insecurity, according to the level of severity, is statistically significant and positively related to children's health complaints. Immunization as an important control variable is also statistically significant and positively related to toddler health complaints. Based on the food insecurity level, the order logit regression analysis results prove that food insecurity is significant and has a positive effect on health complaints. Food insecurity occurs not only in low-income household groups but also in high-income household groups.

Keywords: children, food insecurity, health, immunization, ordered logistics.

Corresponding Author: Mayang Rizqia Dinatingtyas

E-mail: mayang.rizqia01@ui.ac.id



INTRODUCTION

Food insecurity is a global issue and its alleviation is one of Indonesia's priorities (Suryana, 2014). This issue is defined in the 2030 SDGs target 2.1, namely zero hunger and achieving food security for all people to food that is safe, nutritious, and sufficient throughout the year, especially for the poor and those in vulnerable situations, including babies (Prayitno et al., 2022). However, now, this problem is still a major challenge. Even though it has shown an increase in food security, Indonesia still needs to be higher than other countries. If seen from the Global Food Security Index in 2021, Indonesia's food security score is 59.2 percent. It is ranked 69 out of 113 countries worldwide (Megantara & Prasodjo, 2021). Even if you look at the changes compared to 2020, Indonesia is in the second worst place after Uruguay, which has dropped 12 ranks.

One of the indicators to see the achievement of food security in Indonesia is using moderate and severe food insecurity based on the experience scale produced by the Central Bureau of Statistics (Hannavi, 2018). In 2021 it will be 4.79 percent. This means there are 4 to 5 people out of 100 unable to access food continuously during the last year. In addition, there is also a Food Security Index (IKP) produced by the Food Security Agency. There are still disparities in food security between provinces. In Indonesia's western and central parts, they are already very resistant and food secure. However, in eastern Indonesia, they are very food insecure. This indicates Indonesia has not achieved overall food security (Agustino & Widodo, 2022).

Food security that has not been achieved due to a lack of continuous access to nutritious and sufficient food can be at greater risk for malnutrition. Children may be affected even when food insecurity is only at the household level. Indonesia is still facing nutritional problems, especially among children. Although the trend is decreasing, the prevalence of stunting (low height for age) and wasting (low weight for height) in children under five years old (toddlers) is still quite high. Based on the BPS publication (2021), the prevalence of toddler stunting in 2019 was 27.67, as well as the prevalence of toddler wasting in 2019 of 7.4 percent.

Various kinds of consequences can arise from food insecurity, one of which is health. There is a relationship between food insecurity and health. Food insecurity can affect physical, mental, and social health and the quality of life directly or indirectly due to malnutrition (Gundersen & Ziliak, 2015). Food insecurity can be analyzed from the individual, household, to country levels. When households tend to be food insecure, household members will tend to have poor health conditions. This signals that a country with high food insecurity will have an increasingly unhealthy population.

When viewed by age group, the under-five population has the second highest health complaints after the elderly, namely 34.92 percent in 2021. Even though this figure has decreased compared to 2019 which reached 64.71 percent, if you look at the absolute figure it is still quite large, namely around 7 million more children with health complaints. In children aged 0-19, the percentage of health complaints decreased with age and increased again in the age group of 20 to 69 years and over.

Studies on food insecurity and health issues are important to research because everyone and households should have equal opportunities to access adequate and nutritious food on an ongoing basis for a healthy life. There have been many studies analyzing the impact of food insecurity on the health of children under five across countries. Food insecurity is significantly related to poor child health (Wardani et al., 2020). Several other studies have also explained the link between toddlers living in food-insecure households and increased incidence of diabetes, hypertension, anemia, stunting, and childhood obesity (Gundersen & Ziliak, 2018); (Thomas et al., 2019).

In Indonesia, studies on food insecurity on health have also been carried out. However, they have not specifically explained the relationship to the age group of children. The effect of food insecurity on health outcomes has been carried out but has not specifically explained health in children (Sari & Nachrowi, 2022). Even though children's health is important, especially during the golden age or the first 1000 days, health at the beginning of life will affect health during adolescence and adulthood. Health in children also has a high return on investment. With good health, they can get good jobs and income, which determines the quality of the next generation (Mayer-Foulkes, 2004).

In addition, it is important to analyze food insecurity on health in the age group of children because there are fundamental differences between children and adults. Some of the differences such as anatomical structure and function of biochemistry, immunology, and physiology. Children tend to be more susceptible to disease. When exposed to the same disease, more severe symptoms will be felt in children than in adults (Marzuki et al., 2021). In addition, households with children are more vulnerable to food insecurity. The percentage of food-insecure households with children is greater than households without children, at 14.8 percent and 8.8 percent, respectively (Yunita, 2021).

In analyzing health, another important variable that needs to be included is immunization. This is because immunization is a preventive step that aims to increase immunity both in the short and long term. Immunization not only prevents and reduces the number of morbidity, disability, and death from the disease as well as the formation of herd immunity. The immunization variable was ignored in the previous study, so it was suspected that an omitted variable bias would arise. Not include immunization variables because there is missing information due to using samples across the individual age range (Sari & Nachrowi, 2022). Therefore, it is important to include immunization variables in analyzing health determinants in toddlers.

Based on the background above, this study aims to identify the relationship between the level of food insecurity and the health of toddlers by using the order logit regression model from the March 2021 Susenas data.

METHODS

This research uses Susenas data for March 2021, conducted by the Central Bureau of Statistics (BPS). The data used in this study is cross-sectional data at the individual level. The health outcome variable used in this study described health complaints during the last month in children aged 0 to 59 months. Health complaints (heat, cough, runny nose, diarrhea, dizziness, chronic illness, or others). A more severe health condition is characterized by health complaints that interfere with work, school, or daily activities. This health complaint variable is classified into three categories: there are no health complaints, and there are health complaints that do not interfere with daily activities. There are health complaints that interfere with daily activities.

The main independent variable used is food insecurity, measured by eight access-to-food questions. The question is adapted from the Food Insecurity Experience Scale (FIES) developed by FAO's Voices of the Hungry (VoH). There are four possible answers, including Yes, No, Do not know, and Refuse to answer (questions in the attachment). The classification of levels of food insecurity follows Ballard et al. (2005); if all questions are answered no, then the household is classified as food secure; if questions 1 to 3 have yes answers (partially or completely) and no answers to questions 4 to 8, then the household is classified as mild food insecure; if questions 4 to 6 have yes answers (partially or completely) and no answers to questions 7 to 8, then the household is classified as moderate food insecurity. If questions 7 to 8 have a yes answer (partially or completely), the household is classified as severely food insecure.

The unit of analysis in this study is individuals aged 0 to 59 months (4 years). The Susenas questionnaire is asked at the household level for information on food insecurity, so it is assumed that all individuals in the same household have experienced the same food insecurity. The method used is descriptive and inferential analysis. Descriptive analysis is used to see an overview of the existing conditions of the variables that will be used in further processing by analyzing trends, patterns, and differences through numbers or percentages, or graphs. While inferential analysis is used to answer research objectives in analyzing the relationship between variables.

The dependent variable used in this study is categorical, namely toddler health complaints which are divided into three categories, namely code 0 if there are no health complaints; code 1 if there is a health complaint but does not interfere with daily activities; and code 2 if there are health complaints that interfere with daily activities. Of the three categories, it shows that there is a level

of health in toddlers where the higher the code, the more severe the health complaints experienced by the toddler. Assuming that the errors have a logistic distribution, the analysis used to determine the determinants of the health of these toddlers uses an ordered logistic regression model, as follows:

$$CH_i = \beta_0 + \beta_1 F_i + \beta_2 I_i + \sum_n \delta_{1i} X_i + \sum_n \delta_{2i} Q_i + \sum_n \delta_{3i} M_i + \varepsilon_i$$

Where i is the number of samples, $1, \dots, n$, and ε are the error terms. Children's health outcomes using a toddler health complaint (CH) approach. This indicates that toddlers who have complaints have unhealthy conditions. Then F is food consumption in quality and quantity using the household food insecurity approach, which indicates that the more food insecurity a household has, the lower the food consumption. The important control variable I is the immunization status of children under five, whether they have been immunized or not for other control variables used in this study, namely the individual characteristics of toddler X such as gender, age and health insurance, Q 's household characteristics such as smoking status, sanitation, drinking water sources, water shortage status and food assistance and the characteristics of M 's biological mother such as education, marital status, and working status.

A coefficient value of β_i will be generated from the logistic regression model results. However, the coefficient values in the logistic regression analysis cannot be used to make direct interpretations. In order to be interpreted, it is necessary to transform the calculation of each resulting estimated coefficient to obtain the odds ratio (or) value.

RESULTS AND DISCUSSION

Before analysis, a Chow Test was carried out to see if there were structural differences between toddlers who lived with their biological mothers and those who did not. Based on the results of the Chow Test, it can be concluded that there is a statistically significant difference at the 5 percent alpha level, so this study will focus only on toddlers who live with their biological mothers. Based on these criteria, the number of samples used was 88,545 individuals.

Overall, 69 percent of toddlers experienced health complaints during the last month and the remaining 31 percent had health complaints during the last month. Based on the existence of health complaints, it can be examined more deeply whether these complaints interfere with daily activities or not, such as playing or preschool. Toddler health complaints are classified into two categories, namely, health complaints that do not interfere with daily activities, and there are health complaints that interfere with daily health. Overall, 16 percent had health complaints that did not bother them and 15 percent had health complaints that bothered them.

About 76 percent of children under five live in food-insecure households, and 24 percent live in food-insecure families. Of the under-fives who live in food insecure households, when viewed from the level of food insecurity, it is dominated by mild food insecurity at 17 percent, then moderate food insecurity at 5 percent, and severe food insecurity at 2 percent.

Individual characteristics described in this study are immunization status, age, gender, and ownership of under-five health insurance. Overall, the percentage of toddlers who were immunized was 59 percent while the rest did not carry out immunizations at all. If seen based on age characteristics, in this study the average age of toddlers was 2 years. In this study, the percentage of

toddlers who do not have health insurance is 51.63 percent. Free health insurance comes from central and regional government assistance, namely BPJS PBI and Jamkesda, with a total of 28.98 percent.

In contrast, health insurance is paid independently for government and private services. Alternatively, company facilities where their parents work, namely 19.66 percent. If based on gender, as a whole sample, the percentage of male toddlers is greater than that of females. The percentage of toddler boys is 52 percent, and girls are 48 percent.

Household characteristics are also differentiated according to sanitation facilities and proper drinking water sources. Households with proper sanitation, namely households with facilities for defecation alone or with certain households with the type of toilet used is a gooseneck or plengsengan with a lid and a place for final disposal of feces in the form of a septic tank or Waste Management Agency (WWTP). The percentage of children under five in households with inadequate sanitation and drinking water sources is 29.11 percent and 31.18 percent, respectively. The percentage of children under five living in households that have experienced water shortages is 4.38 percent. As much as 70.34 percent of children under five live in households where there is at least one member of the household who smokes.

The mother's characteristics that will be explained are the last level of education, marital status, and working status. Toddlers dominated the sample in this study with biological mothers with secondary school (junior high and high school) levels, namely 56.12 percent, then those who had never attended school and elementary school level (SD) of 22.95 percent and tertiary level of 20.93 percent. Based on marital status, the overall sample of children under five whose mothers had been married was 2.48 percent. Meanwhile, based on their working status, the sample in the study was more than half whose mothers did not work, namely 57.47 percent.

Table 2. β Coefficient Estimation Results with Logit Order

Variable (1)	Specifications 1 (2)	Specifications 2 (3)	Specifications 3 (4)
Food Insecurity			
light	0.368*** (0.024)	0.364*** (0.024)	0.361*** (0.024)
currently	0.226*** (0.042)	0.225*** (0.042)	0.221*** (0.042)
critical	0.215*** (0.059)	0.210*** (0.060)	0.210*** (0.060)
Non-Immunization Status	0.036** (0.017)	0.032* (0.017)	0.034** (0.017)
FI*immune			
Light	0.001 (0.037)	0.001 (0.037)	0.002 (0.037)
Currently	0.211*** (0.064)	0.208*** (0.064)	0.213*** (0.064)
Critical	0.085 (0.090)	0.080 (0.091)	0.083 (0.091)
Inpatient	0.479*** (0.034)	0.474*** (0.034)	0.475*** (0.034)
Jamkes			
Help	0.144***	0.139***	0.138***

Variable (1)	Specifications 1 (2)	Specifications 2 (3)	Specifications 3 (4)
	(0.016)	(0.016)	(0.016)
Non-Aid	0.001	0.001	0.007
	(0.018)	(0.020)	(0.021)
Toddler Gender	0.045***	0.046***	0.046***
	(0.014)	(0.014)	(0.014)
Toddler Age	0.010*	0.022**	0.005
	(0.005)	(0.005)	(0.005)
Proper sanitation		0.038**	0.040***
		(0.016)	(0.016)
Drink decent		0.129***	0.134***
		(0.016)	(0.016)
Lack of water		0.123***	0.121***
		(0.034)	(0.034)
Food aid		0.100***	0.096***
		(0.019)	(0.019)
Smoker's household		0.128***	0.123***
		(0.015)	(0.016)
Mother's education			0.026
Middle-High School			(0.018)
> high school			-0.073***
			(0.023)
Mother's marital status			0.089*
			(0.047)
Mother's Working Status			0.107***
			(0.015)
cut1	1,001	1230	1.355
	(0.019)	(0.027)	(0.054)
cut2	1947	2.177	2,302
	(0.020)	(0.028)	(0.055)
Number of Samples	88545	88545	88545
Prob > chi2	0.0000	0.0000	0.0000
Pseudo R2	0.0053	0.0064	0.0069
LL	-73675.43	-73588.83	-73554.72
AIC	147378.9	147215.7	147155.4
BIC	147510.3	147394.1	147371.4

*90% ; **95%; ***99%

Source: Susenas 2021, processed

The inferential analysis used in this study is ordered logistic regression. Logistic order regression is a method used to see the relationship between variables with the dependent variable, which has more than two categories and levels. Model selection and robustness tests are carried out by conducting the LR test and checking the consistency of the coefficient values and the direction of the variable of interest. This test is carried out by entering the control variable in stages.

Specification 1 only includes control variables for individual characteristics. A control variable for household characteristics is added in specification two. Finally, a control variable for biological mother characteristics is added in specification three. Based on the results of the LR test, the largest pseudo R2 value, the largest log-likelihood value, and the smallest AIC and BIC values, the model

chosen for further analysis is specification 3. The results of order logit regression can also be analyzed using the odds ratio (or) value.

Table 3. Estimation of *Odd Ratio* Equation Order Logit

Variable (1)	Specifications 3 <i>Odd Ratio</i> (2)
Food Insecurity	
light	1.434*** (0.035)
currently	1.248*** (0.053)
critical	1.234*** (0.074)
Non-Immunization Status	1,034* (0.018)
FI_immune	
Light	1,002 (0.037)
Currently	1.238*** (0.079)
Critical	1,086 (0.099)
Inpatient	1.609*** (0.055)
Jamkes	
Help	1.148*** (0.019)
Non-Aid	1.007 (0.021)
Toddler Gender	1.047*** (0.015)
Toddler Age	1006 (0.005)
Proper sanitation	1,041** (0.017)
Drink decent	1.143*** (0.019)
Lack of water	0.128*** (0.039)
Food aid	1.101*** (0.021)
Smoker's household	1.131*** (0.018)
Mother's education	
Middle-High School	1027 (0.018)
> high school	0.928*** (0.022)
Mother's marital status	1,093* (0.051)
Mother's Working Status	1.113***

(0.016)

*90% ; **95%; ***99%

Source: Susenas 2021, processed

The follow-up analysis aims to see the effect of household food insecurity on children's health according to per capita expenditure which is divided into three categories, namely the low, middle, and high groups. This aims to confirm that food insecurity indicates that the community lives in a financially limited society.

Table 4. Estimation of Coefficient Value (β) and Odd Ratio (OR)
Equation Order Logit based on Per Capita Spending Group

Variable	Per Capita Expenditure Level					
	Low		Intermediate		On	
(1)	β	OR	β	OR	β	OR
(2)	(3)	(4)	(5)	(6)	(7)	
Food Insecurity						
Light	0.414*** (0.033)	1.513*** (0.050)	0.313*** (0.041)	1.368*** (0.057)	0.393*** (0.091)	1,482*** (0.135)
Currently	0.274*** (0.052)	1.315*** (0.069)	0.194** (0.078)	1,214** (0.094)	0.155 (0.218)	1.168 (0.255)
Critical	0.238*** (0.074)	1.269*** (0.094)	0.280** (0.111)	1.323** (0.147)	-0.054 (0.288)	0947 (0.273)
Non-Immunization Status	-0.002 (0.027)	0997 (0.027)	0.083*** (0.027)	1,087*** (0.029)	0.021 (0.043)	1,022 (0.040)
FI*immune						
Light	-0.015 (0.050)	0.985 (0.050)	0.021 (0.063)	1021 (0.064)	0.122 (0.146)	1,129 (0.165)
Currently	0.250*** (0.078)	1.284*** (0.101)	0.166 (0.122)	1,181 (0.144)	0.209 (0.328)	1,233 (0.404)
Critical	0.062 (0.112)	1,064 (0.119)	0.178 (0.170)	1,195 (0.203)	0.040 (0.447)	1040 (0.465)
Inpatient	0.0497*** (0.508)	1.645*** (0.095)	0.0482*** (0.053)	1,620*** (0.086)	0.0418*** (0.070)	1.519*** (0.107)

*90% ; **95%; ***99%

Source: processing results

Most of the variables are significant at various levels of significance. In contrast, the variables that are not significant are the interaction variables between the levels of mild and severe food insecurity and immunization, non-assisted health insurance, toddler age, mother's education at the junior secondary level (SMP/equivalent) to upper secondary (SMA/ equal) and the mother's marital status.

The direction or sign of the coefficient can only interpret analysis based on the value of the beta coefficient. The food insecurity variable has a positive sign in both equation models, which means that toddlers living in households with mild, moderate, and severe food insecurity have a greater chance of experiencing more severe health complaints compared to toddlers living in food-insecure households. Households prone to light food have concerns that they will not have enough food and will still be able to eat even with a small variety of food that can affect the health of their toddlers. This finding aligns with the research (Handriyanti & Fitriani, 2021) that children living in food-insecure households have a greater chance of experiencing poor health conditions than those

in food-insecure households. These results are consistent after checking the robustness in several model conditions.

Based on the odds ratio, the more severe the level of household food insecurity, the smaller the value of OR . Toddlers living in mild food insecure households have a 1.434 times chance of toddlers living in food insecure households experiencing health complaints getting worse, while toddlers living in moderately food insecure households have a 1.248 times chance of toddlers living in a mild food insecure household. food insecurity for increasingly severe health complaints. Toddlers living in severely food insecure households have a 1.234 times chance that toddlers living in food insecure households experience health complaints getting worse. This indicates that households that are bland and food insecure, even without hunger, are very vulnerable to affecting the health of their toddlers.

Immunization status and ownership of health insurance assistance for toddlers and toddlers of the male sex have a value of OR more than 1, which means they have a greater chance of health complaints. Toddlers who do not get immunizations have a 1,034 times greater chance of experiencing health complaints getting worse. Toddlers with health insurance sourced from government assistance have 1.148 times the chance of toddlers who do not have health insurance experiencing health complaints getting worse. Toddlers who are male have 1,047 times the chance of women experiencing health complaints that interfere with daily activities.

The existence of an interaction variable between food insecurity and immunization indicates that there is a conditional relationship between household food insecurity on children's health which is determined by their immunization status. The chance of experiencing health complaints in toddlers living in moderately food-insecure households is greater than in toddlers living in mildly vulnerable households. Toddlers who live in moderate food insecure households and receive immunizations have a 1.543 times chance of toddlers who do not get immunizations experiencing health complaints. However, for toddlers who live in severely food insecure households, the chance is smaller than the others, and the interaction variable with immunization is not significant. This indicates that toddlers living in severe food insecurity are susceptible to disease, so immunization does not have much effect on increasing the toddler's immune system.

The higher the per capita expenditure group, the more variable household food insecurity at medium and low levels is increasingly insignificant. In the upper group, children under five living in moderate and severe food insecurity households were not statistically significant for health complaints; only mild food insecurity levels were statistically significant. The low per capita expenditure group has almost the same pattern as the overall model. In the low group of households, mild, moderate, and severe food insecurity was statistically significant to children's health complaints.

In addition, household food insecurity on children's health according to per capita expenditure can also show a comparison of objective poverty and subjective poverty. FAO combines objective and subjective aspects of food insecurity. Three of the FIES questions can be considered to refer to subjective perceptions. In contrast, the other five questions ask about objective experiences due to a lack of money or other resources (Herlina et al., 2020). The findings of this study prove that there is a subjective perception that food insecurity can not only be experienced by households who have

a low economy but can also occur in upper-income households have high incomes, which is in line with (Dudek & Myszkowska-Ryciak, 2020).

The immunization variable was not statistically significant for children's health complaints in the low and high per capita expenditure groups. It was only significant in the medium per capita expenditure group. Furthermore, the effect of the variable health insurance assistance in the three groups of per capita expenditure also shows the same pattern as the entire model, which is statistically significant and positively related.

Based on the odds ratio, the level of light food insecurity is greatest in households with the low per capita expenditure group, then the upper group, and lastly, the middle group. In the low per capita expenditure group, toddlers living in mild food insecure households have a 1.513 times chance of toddlers living in food insecure households experiencing severe health complaints. In the upper per capita expenditure group, toddlers living in mild food insecure households have 1.482 times the chance of toddlers living in food insecure households experiencing health complaints getting worse. In the middle per capita expenditure group, toddlers living in mildly food insecure households have a 1.375 times chance that toddlers living in food insecure households experience health complaints getting worse.

CONCLUSION

In this study, it can be concluded that household food insecurity is related to toddler health complaints. Based on the food insecurity level, the order logit regression analysis results prove that food insecurity is significant and has a positive effect on health complaints. Food insecurity occurs not only in low-income household groups but also in high-income household groups.

Other determinants that statistically significantly influence children's health complaints are immunization, government-assisted health insurance, gender, sanitation and proper drinking water sources, water shortage status, food assistance, smoking household status, mother's education above high school/equivalent, status marriage, and working status of the mother. When viewed from the direction of influence, a mother's education above SMA/equivalent has a negative influence on children's health complaints, while immunization, government assistance health insurance, gender, sanitation, proper drinking water sources, water shortage status, food assistance, smoker's household status, marital status and working status of the mother have a positive influence on children's health complaints.

REFERENCES

- Agustino, H., & Widodo, E. R. P. (2022). Analisis Implementasi Kebijakan Sosial Pencegahan Stunting di Kabupaten Malang. *Sospol: Jurnal Sosial Politik*, 8 (2), 241–252. <https://doi.org/10.22219/jurnalsospol.v8i2.22558>
- Dudek, H., & Myszkowska-Rycki, J. (2020). The prevalence and socio-demographic correlates of food insecurity in Poland. *International Journal of Environmental Research and Public Health*, 17 (17), 6221. <https://doi.org/10.3390/ijerph17176221>.
- Gundersen, C., & Ziliak, J. P. (2015). Food insecurity and health outcomes. *Health Affairs*, 34 (11), 1830–1839. <https://doi.org/10.1377/hlthaff.2015.0645>.
- Gundersen, C., & Ziliak, J. P. (2018). Food insecurity research in the united states: Where we have been and where we need to go. *Applied Economic Perspectives and Policy*, 40 (1), 119–135. <https://doi.org/10.1093/aep/ppx058>
- Handriyanti, R. F., & Fitriani, A. (2021). Analisis keragaman pangan yang dikonsumsi balita terhadap risiko terjadinya stunting di Indonesia. *Muhammadiyah Journal of Nutrition and Food Science (MJNF)*, 2 (1), 32–42. <https://doi.org/10.24853/mjnf.2.1.32-42>.
- Hannavi, I. E. (2018). *Analisis ketahanan pangan rumah tangga pedesaan di Kabupaten Kudus*.
- Herlina, H., Sartono, B., & Susetyo, B. (2020). Kajian Validitas Instrumen Pengukuran Skala Pengalaman Kerawanan Pangan di Indonesia. *Indonesian Journal of Statistics and Its Applications*, 4 (1), 136–155. <https://doi.org/10.29244/ijsa.v4i1.543>.
- Marzuki, I., Bachtiar, E., Zuhriyatun, F., Purba, A. M. V., Kurniasih, H., Purba, D. H., Chamidah, D., Jamaludin, J., Purba, B., & Puspita, R. (2021). *COVID-19: seribu satu wajah*. Yayasan Kita Menulis.
- Megantara, F. S., & Prasodjo, N. W. (2021). Analisis Gender Pada Ketahanan Pangan Rumah Tangga Petani Agroforestri. *Jurnal Sains Komunikasi Dan Pengembangan Masyarakat [JSKPM]*, 5 (4), 577–596. <https://doi.org/10.29244/jskpm.v5i4.858>.
- Prayitno, G., Hasyim, A. W., Subagiyo, A., Dinanti, D., & Roziqin, F. (2022). *Ruang Berketahanan Pangan: Menjawab Tantangan Produksi Pangan Berkelanjutan dengan Optimalisasi Keruangan Menuju Indonesia Berdaulat*. Universitas Brawijaya Press.
- Sari, O. A., & Nachrowi, N. D. (2022). Pengaruh Kerawanan Pangan, Bantuan Pangan dan Jaminan Kesehatan terhadap Keluhan Kesehatan. *Jurnal Ekonomi Dan Pembangunan Indonesia*, 22(1), 1. <https://doi.org/10.21002/jepi.2022.01>
- Suryana, A. (2014). *Menuju ketahanan pangan indonesia berkelanjutan 2025: tantangan dan penanganannya*.
- Thomas, M., Miller, D. P., & Morrissey, T. W. (2019). Food insecurity and child health. *Pediatrics*, 144 (4).
- Wardani, D. W., Suharmanto, S., & Wulandari, M. (2020). Hubungan Faktor Sosial Ekonomi dan Ketahanan Pangan terhadap Kejadian Stunting pada Balita. *Jurnal Kesehatan*, 11 (2), 287–293.
- Yunita, H. (2021). Status Bekerja, Struktur Keluarga Dan Kerawanan Pangan Rumah Tangga Dengan Anak. *Jurnal Ekonomi Dan Kebijakan Publik Indonesia*, 8 (1), 1–18. <https://doi.org/10.24815/ekapi.v8i1.21166>



© 2023 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY SA) license (<https://creativecommons.org/licenses/by-sa/4.0/>).