

ORIGINAL ARTICLE

Factors Affecting Malnutrition in Toddlers at Blitar City

Riezky Faisal Nugroho¹, Erika Martining Wardani²¹ Department of Nutrition, Politeknik Kesehatan Kemenkes Surabaya, 60282 Surabaya, East Java, Indonesia² Department of Nursing, Faculty of Nursing and Midwifery, Universitas Nahdlatul Ulama Surabaya, 602310 Surabaya, East Java, Indonesia

ABSTRACT

Introduction: Malnutrition is a picture of a child's weight that is not in accordance with his age. Poor nutrition is influenced by several factors: family income, mother's knowledge, and mother's parenting pattern. This study aims to analyze the effect of family income, mother's knowledge, mother's parenting in toddler at Blitar City. **Methods:** This study is an analytic observational study, with a case-control design. The sample size is 32 cases and 32 controls. The dependent variable in this study was the incidence of malnutrition and the independent variables consisted of family income, mother's knowledge and mother's parenting pattern. The independent and the dependent variables were measured by questionnaire. Data analysis was performed univariately and bivariately. **Results:** The results showed that, there are two variables that affect the incidence of malnutrition. The two variables are family income with a p-value of 0.001 with an OR value of 7.566, and maternal parenting with a p-value of 0.01, with an OR value of 3.770. **Conclusion:** Efforts to improve education on maternal parenting need to be carried out, which include simple feeding and food processing, the process of bathing children under five and the application of hygiene practices, such as washing hands before processing and serving food.

Keywords: Malnutrition; Income; Knowledge; Parenting; Toddler**Corresponding Author:**

Riezky Faisal Nugroho, S.ST., M.Gz

Email: riifan7@gmail.com

Tel: +6285236534455

INTRODUCTION

One of the unresolved health problems in Indonesia is malnutrition in children under five which contributes to the low quality of human resources (HR) in Indonesia (1, 2, 3). Malnutrition in toddlers is a condition where toddlers experience a lack of nutritional ingredients needed by the body for growth and development, so that the child's weight does not match his age (4, 5). Nutrient intake is one of the factors related to the nutritional status of children under five. During the period of physical growth and brain development, toddlers need adequate and balanced nutritional intake, if toddlers' intake is lacking, toddlers will experience malnutrition or nutritional disorders (6).

Every toddler everywhere has the opportunity to suffer from malnutrition, by measuring: weight for age and height for age. The impact of malnutrition is very complex. Children can experience disorders of mental development, social, cognitive and growth. Example of growth disorders such as malfunctioning of body

organs. Other disorders that do not appear in the form of low immunity, causing susceptibility to various diseases such as respiratory tract infections, diarrhea and fever. Therefore, it is very important to know the determinants of malnutrition in toddlers (7). Malnutrition in toddlers is influenced by several factors, that are family income, mother's knowledge, and mother's parenting pattern (7).

The World Health Organization (WHO) 2013, states that around 17% or 98 million children under the age of five in developing countries suffer from malnutrition. The prevalence of malnutrition was highest in the UN region, South Asia (30%), followed by West Africa (21%), Oceania and East Africa (both 19%) and Southeast Asia and Central Africa (both 16%), and South Africa (12 %) (8). Riskesdas East Java 2018 shows the prevalence of undernourished children under five in Blitar City is 9.14% and an increase of 11.5% in 2020 (9). Data from the Blitar City Health Service in 2020, the prevalence of undernourished children under five years in 3 districts of Blitar City is 5.44% (10).

Inadequate parenting provided by parents, or in the form of attitudes and behaviors that do not provide appropriate nutritional intake for toddlers, can result

in malnutrition, which will risk causing disturbances such as inappropriate weight and height, thin body, short, even shortness of breath. Malnutrition occurs in toddlers or vice versa, toddlers become obese, not according to age, susceptible to infection or disease and can also affect toddlers' intelligence (11).

Family income determines economic conditions which are closely related to the ability to fulfill nutritious intake and health services for pregnant women and toddlers. Family with low income will manage spending for shopping by relying on limited income. Even though the staple food and side dishes can be met every day, but the quality and the quantity is not considered, so that low economic status can indirectly cause stunting in toddlers (12). Mother is the person responsible for taking care of child, so it is very important for mothers to have enough knowledge regarding nutrition of the child. Mothers who have more knowledge about nutrition can bring up their children in healthy way (13, 14, 15). This study aims to analyze the effect of family income, mother's knowledge, mother's parenting in toddler at Blitar City.

MATERIALS AND METHODS

Study design

The type of research used is analytical observational research with a case control approach, that is analyzing the dynamics of the correlation between phenomena or between risk factors and effect factors, that are the influence of family income, mother's knowledge and mother's parenting pattern on the incidence of malnutrition in toddlers at Blitar City.

Population, Samples and Sampling

The population in this study were mother with children under 5 years old with malnutrition and normal nutrition in the working area of the Sukorejo, Kepanjenkidul and Sananwetan Health Centers, Blitar City, with a known population of 77 children under five years old. Sampling of cases using total sampling technique. The sample cases in this study were all mothers who had children under five years old who were malnourished as many as 32 cases. The comparison of case and control samples was 1:1. Overall the number of samples was 64. The inclusion criteria for the case and control groups used were recorded as mothers who have children under five years old with poor nutritional status in Sukorejo District, Kepanjenkidul, Sananwetan Blitar City and have a Card Towards Health, toddler who have mother and family, mother can read and write. The exclusion criteria for the case and control groups were that the respondent had moved from Sukorejo District, Kepanjenkidul Sananwetan, Blitar City and the respondent had died. The dependent variable in this study is the incidence of malnutrition and the independent variables consist of family income,

mother's knowledge and mother's parenting pattern.

Instruments

The data collected in this study include primary data and secondary data. Primary data were obtained directly from the results of interviews using questionnaires to respondents related to family income, mother's knowledge and mother's parenting pattern. The family income questionnaire was obtained from interviews using a questionnaire derived from family income compared to the minimum wage in Blitar city. The family income category is high if the family income is above the minimum wage (family income > Rp. 2.004.750, / month) and the family income category is low if the family income is below the minimum wage (family income < Rp. 2.004.750,-/month) (16). Mother's knowledge questionnaire about stunting was obtained using a questionnaire consisting of 15 multiple choice questions. The correct answer is given a score of 1 and the wrong answer is given a score of 0. Categories of mother knowledge about stunting are divided into 3: Good ($\geq 75\%$), Enough (56-74%) and Less (<55%) (17). The mother's parenting pattern questionnaire was obtained using a questionnaire consisting of 15 questions. The correct answer is given a score of 1 and the wrong answer is given a score of 0. Categories of maternal parenting are divided into 3: Good ($\geq 80\%$), Enough (79-61%) and Less (<60%) (18). Secondary data contains data on malnourished toddlers from the Sukorejo, Kepanjenkidul, Sananwetan and Blitar City Health Offices.

Procedure

The researcher applied for a research permit to the National Unity, Political and Regional Disaster Management Agency of Blitar City. Researchers asked for data from Sukorejo Public Health Center, Kepanjenkidul, Sananwetan and the Blitar City Health Office and then collected data by distributing research instruments equipped with research information sheets and informed consent to prospective respondents. In this implementation stage, the researcher does not work alone, the researcher is assisted by enumerators.

Data Analysis

The statistical analysis was performed using Statistical Package for the Social Sciences (SPSS) v25. Descriptive analysis is used to determine the frequency distribution. Hypothesis testing using Chi Square test with a limit of significance (α) 0.05 and 95% confidence level. To justify the risk factor, it is continued with the calculation of the Odds Ratio (OR).

Ethical Committee Approval

This research protocol has been approved by the medical research ethics committee of Universitas

Nahdlatul Ulama Surabaya No. 0360/EC/KEPK/UNUSA/2020.

RESULTS

Characteristics of the respondents

The results showed that the majority of the toddler's mother in the case group were aged 27 - 34 years with a proportion of 46.8% while mothers of children under five years old in the control group were 53.2%. The last educational level of the majority of the respondents were junior high school as much as 37.5% in the case group, while 53% respondent have educational level at college education in the control group. 96,9% respondents of the case group and 18,7% respondents of the control group worked as housewives. Most of the toddlers (68,7%) in the case group and 75% toddlers in the control group were female. The results of the study on the frequency distribution based on the characteristics of the respondents can be seen in Table I.

Table I : Characteristics of Toddlers and Mothers in Blitar City 2021

Characteristics	Malnutrition			
	Case		Control	
	n	%	n	%
Mother's age				
19-26	14	43.7	12	37.5
27-34	15	46.8	17	53.2
35-42	3	33.2	2	6.2
Mother's Education				
Not finished	9	28.1	0	0
Elementary School	11	34.4	0	0
Junior High School	12	37.5	0	0
Senior High School	0	0	15	46.8
College	0	0	17	53
Mother's Job				
Housewife	31	96.9	6	18.7
Entrepreneur	1	3.1	11	34.3
Civil Servant	0	0	15	46.8
Toddler Gender				
Boy	10	31.2	8	25
Girl	22	68.7	24	75

Analysis of the Effect of Independent Variables on the Incidence of Malnutrition in Toddlers in Blitar City

The results of the analysis of the influence of independent variables (family income, mother's knowledge and mother's parenting pattern) on the incidence of malnutrition in children under five years old in Blitar City in 2021 are as show in Table II.

Table II : Analysis of the Effect of Independent Variables on the Incidence of Malnutrition in Toddlers in Blitar City in 2021

Variable	Malnutrition		p-value	OR (95% CI)
	Case	Control		
	n (%)	n (%)		
Family Income				
Low	26 (81.3%)	5 (15.6%)	0.001	7.566
High	6 (18.7%)	27 (84.4%)		
Mother's Knowledge				
Enough	12 (37.5%)	4 (12.5%)	0.102	1.462
Good	20 (62.5%)	28 (87.5%)		
Mother's Parenting				
Bad	21 (65.6%)	9 (28.1%)	0.010	3.770
Good	11 (34.4%)	23 (71.9%)		

The results of statistical tests to assess the effect of family income on the incidence of malnutrition showed a significance value (p-value) of 0.001 ($\alpha=0.05$). This means that there is a significant effect of family income on the incidence of malnutrition in children under five years old. The OR value obtained was 7.566 (95% CI: 2.386-24.058). This means that family income is a risk factor for the occurrence of malnutrition in children under five years old. Respondents who have less income, have a 7,566 times risk of experiencing malnutrition, compared to respondents who have sufficient income. Meanwhile, the effect of maternal parenting on the incidence of undernutrition shows a significance value (p-value) of 0.01 ($\alpha=0.05$), which means that there is a significant effect of maternal parenting on the incidence of undernutrition in children under five years old. The OR value was 3.770 (95% CI: 1.341-11.172). This means that maternal parenting is a risk factor for the occurrence of malnutrition in children

under five years old. Respondents who have poor parenting have 3,770 times the risk of under five years old experiencing malnutrition, compared to respondents who have good parenting. The results of statistical tests to assess the effect of mother's knowledge on the incidence of malnutrition, showed a significance value (p-value) of 0.102 ($\alpha=0.05$), which means that there was no significant effect of mother's knowledge on the incidence of undernutrition in children under five years old.

DISCUSSION

Toddlers are an age group that is vulnerable to nutrition, because they require a large intake of nutrients during growth and development. If the toddler lacks nutritional intake, the toddler experiences malnutrition. Malnutrition experienced at this time will inhibit the growth and development of toddlers to adults and is irreversible. As a result, children will experience failure to grow so that they have body sizes such as height that are not in accordance with their age (19). The results of this study indicate that the incidence of malnutrition that is still experienced by toddlers in Blitar City is influenced by family income and mother's parenting patterns.

Indonesia is currently included in the category of developing countries because it still has a low income level (20). Low income will affect the fulfillment of food needs, especially nutritious food needed by family members. If income increases, consumption patterns will be more diverse so that the consumption of food with high nutritional value will also increase (21).

In the areas of the Sukorejo, Kepanjenkidul and Sananwetan Health Centers in Blitar City, most of the respondents have low family incomes. This may be influenced by regional factors, education level, employment opportunities, and the lack of use of social assistance. If viewed from the education level of the respondents, namely mothers who have children under five, it turns out that most mothers of toddlers have the last education level of Junior High School. Education level is a predictor of malnutrition in five years old (22). Most studies show a positive relationship between mother education and child development, at all developmental stages (infancy, toddler, or preschool). A high level of mother education is very beneficial for toddlers in terms of cognitive, socio-emotional development and healthy children's BMI (23)

Respondents who have a low level of education will have difficulty in seizing job opportunities, due to lack of education and special skills. The results of the interview also showed that respondents did

receive assistance from the social service, in the form of the Program Keluarga Harapan (PKH) assistance, but the assistance received was not used properly. In addition, it is suspected that the type of work also contributes to the low income. Most mothers of toddlers only work as housewives. This economic limitation may cause the inability to buy food with good quality, so that the fulfillment of the nutritional needs of children under five is not adequate. This study is in line with previous research which found that there was a significant effect of family income on the incidence of malnutrition in children under five years old (24).

In addition to income, poor parenting from mother to toddler causes inadequate feeding and care for children under five years old. Parenting patterns are from mother to their children. The forms of care are in the form of attitudes and behavior in their proximity to children, providing food, caring for, maintaining cleanliness and giving love. Theoretically, parenting consists of six parts, namely maternal attention to children, breastfeeding, psychosocial stimulation to children, food storage, hygiene practices and health care for toddlers such as seeking health services (25). Breastfeeding and complementary feeding for children as well as food preparation and storage are included in the practice of feeding (26). In the areas of the Sukorejo, Kepanjenkidul and Sananwetan Health Centers in Blitar City, most mothers of children under five have poor parenting. This can be seen in mothers who pay less attention to the cleanliness of their toddlers. In addition, the storage and provision of food ingredients is also limited, due to the lack of family income. They cannot afford to buy enough food to meet the nutritional needs of household members. This study is in line with previous research which found that there was a significant effect of maternal parenting on the incidence of malnutrition in children under five years old (24, 27).

In addition to the influence of income and parenting patterns, this study also found that mother's knowledge was not a risk factor for malnutrition in the Sukorejo Public Health Center, Kepanjenkidul, Sananwetan, Blitar City. In the area of the Sukorejo Health Center, Kepanjenkidul, Sananwetan, Blitar City, most of the mothers of children under five have good knowledge. From the results of in-depth interviews, it is known that this knowledge is obtained when they participate in posyandu activities every month. The results of this study are in line with previous studies which found that there was no significant effect of mother's knowledge on the incidence of malnutrition in children under five years old (28).

This study, although found two risk factors for

malnutrition with significant OR values, but still has weaknesses. Because the type of research used is an analytic observational research with a case control research design, it is possible that the conditions of the past risk factors that were asked to mothers of children under five did not describe the actual situation. There is a possibility that the information provided by the respondent is incomplete (recall bias).

CONCLUSION

The present study can be concluded that there are an effect of family income and mother's parenting pattern in toddler at Blitar City. Efforts to improve parenting education for mothers need to be carried out which include simple feeding and food processing, the process of bathing toddlers and the application of hygiene practices, such as washing hands before processing and serving food.

ACKNOWLEDGMENT

This research can be carried out properly thanks to the assistance of various parties, for that the researchers would like to thank the Pusat Unggulan Iptek (PUI) Poltekkes kemenkes Surabaya, LPPM Universitas Nahdlatul Ulama Surabaya, National Unity Agency, Politics and Regional Disaster Management in Blitar City, Blitar City Health Office, Sukorejo Community Health Center, Kepanjenkidul and Sananwetan for their support. provide good cooperation in research in this study.

REFERENCES

1. Lastanto, Indri H, Cindy A. Analisis Faktor Yang Mempengaruhi Kejadian Balita Gizi Kurang di Wilayah Kerja Puskesmas Cebongan. *Jurnal Stikes Kusuma Husada*. 2014;1: 1–14.
2. Tasnim. Determinants of Malnutrition in Children Under Five Years in Developing Countries: A Systematic Review. *Indian Journal of Public Health Research and Development*. 2018; 9(6):333.
3. Paul P, Arra B, Hakobyan M, Hovhannisyan MG, Kauhanen J. The determinants of under-5 age children malnutrition and the differences in the distribution of stunting—A study from Armenia. *PLoS ONE*. 2021; 16(5): e0249776.
4. Alamsyah D, Mexitalia M, Margawati A. Beberapa Faktor Risiko Gizi Kurang Dan Gizi Buruk Pada Balita 12-59 Bulan. *Jurnal Vokasi Kesehatan*. 2015; 1(5): 131-135.
5. Kliegman RM, Stanton BM, et Geme III JW, Schor NF. *Nelson textbook of pediatrics*. Edition 20. Philadelphia: Elsevier; 2016.
6. Toby YR, Anggraeni LD, Rasmada, S. Analisis Asupan Zat Gizi Terhadap Status Gizi Balita. *Faletehan Health Journal*. 2021; 8(2): 92-101.
7. Hidayat AAA, Prasetyo E. Predictors of Malnutrition in Children Aged Less than 5 Years in Surabaya, Indonesia. *Pakistan Journal of Nutrition*. 2015; 17(12): 641-646.
8. World Health Organization. (2013). UNICEF Annual Report. From <https://www.unicef.org/reports/annual-report-2013>.
9. Riset Kesehatan Dasar. (2018). Laporan Provinsi Jawa Timur Riskesdas 2018. From <https://ejournal2.litbang.kemkes.go.id/index.php/lpb/article/view/3752>.
10. Dinkes Kota Blitar. Laporan Pemantauan Status Gizi Balita Tahun 2020. Blitar. 2020.
11. Item DR, Dary, Mangalik G. Pola Asuh Orang Tua Dan Tumbuh Kembang Balita. *Jurnal Keperawatan*. 2021; 13(2): 273-286.
12. Rahma IM, Mutalazimah M. Correlation between Family Income and Stunting among Toddlers in Indonesia: A Critical Review. *Advances in Health Sciences Research*. 2022; 49: 78-86.
13. Aljohani AA, Aljohani MA. The Knowledge of Mothers About Children Malnutrition And Associated Factors. *International Journal of Medicine in Developing Countries*. 2020; 4(1): 7–11.
14. Ravaoarisoa L, Razafimahatratra MJJ, Rasolofozafy H, Pourette D, Rakotomanga JDM, Rakotonirina J. Knowledge And Perception Of Malnutrition Among The Rural Population In The Central Highlands, Madagascar. *Pan Afr Med J*. 2021; 39:277.
15. Jardi C, Casanova BD, Arija V. Nutrition Education Programs Aimed at African Mothers of Infant Children: A Systematic Review. *International Journal of Environmental Research and Public Health*. 2021;18(14):7709.
16. Government Blitar City. (2021). Pemkot Blitar Tetapkan Kenaikan Upah Minimum Kerja (UMK) Kota Blitar. Form <https://blitarkota.go.id/id/berita/pemkot-blitar-tetapkan-kenaikan-upah-minimum-kerja-umk-kota-blitar>.
17. Hulu SCS. (2020). Hubungan Pengetahuan Dan Sikap Ibu Tentang Stunting Dengan Kejadian Stunting Pada Anak Di Paud Terintegrasi Posyandu Kecamatan Lubuk Pakam. Form <http://repo.poltekkesmedan.ac.id/jspui/bitstream/123456789/4863/1/KT1%20STEVEN%20CARLOS.pdf>.
18. Kusyantomo YB. (2017). Hubungan Pola Asuh Ibu Dengan Status Gizi Balita Di RW VI Kelurahan Manisrejo Kecamatan Taman Kota Madiun Tahun 2017. Form <http://repository.stikes-bhm.ac.id/248/1/79.pdf>.
19. Jawad IH, Al-Jubori KH, Baiee HA. Prevalence and Associated Factors of Under Nutrition Among Under-Five Children in Babylon Province, Iraq, 2016. *Journal of University of Babylon for Pure and Applied Sciences*. 2018; 26(3): 123–153.
20. Isnaeni A, Ermawati L, Fitri A. Pengaruh Penurunan Tarif Pajak Penghasilan Umkm Terhadap

- Kepatuhan Wajib Pajak Umkm Ditinjau Dalam Perspektif Islam. *Jurnal Akuntansi dan Pajak*. 2021; 22(02): 1-7.
21. Yudaningrum A. (2011). Analisis Hubungan Proporsi Pengeluaran dan Konsumsi Pangan Dengan Ketahanan Pangan Rumah Tangga Petani di Kabupaten Kulon Progo. Form <https://core.ac.uk/download/pdf/12348718.pdf>.
 22. Ladu JLC, Athiba AL, Lukaw YS. Impact of Malnutrition on Children Less Than Five Years of Age in Juba Payam (District), Republic of South Sudan. *American Journal of Food and Nutrition*. 2018; 6(4): 103-107.
 23. Schochet ON, Johnson AD, Ryan RM. The Relationship Between Increases In Low-Income Mothers' Education And Children's Early Outcomes: Variation By Developmental Stage And Domain. *Children and Youth Services Review*. 2020; 109: 1-17.
 24. Nuraliyani N, Yohanta E. Faktor Tidak Langsung dengan Kejadian Gizi Kurang dan Buruk pada Balita di Wilayah Kerja Puskesmas Kutabumi Kabupaten Tangerang. *Jurnal Kesehatan*. 2018;7(2):11–25.
 25. Ashar T, Lubis Z, Aritonang E. Analisis Pola Asuh Makan dan Status Gizi pada Bayi di Kelurahan PB Selayang Medan. Medan: Universitas Sumatera Utara; 2008.
 26. Amalia H. Hubungan Pola Asuh Gizi Ibu dengan Status Gizi Balita di Wilayah Kerja Puskesmas Lamper Tengah Kota Semarang. *Journal of Health Education*. 2016.
 27. Handayani R. Faktor-Faktor Yang Berhubungan Dengan Status Gizi Pada Anak Balita. *Jurnal Endurance*. 2017;2(2): 217–24.
 28. Pormes WE, Rompas S, Ismanto AY. Hubungan Pengetahuan Orang Tua Tentang Gizi Dengan Stunting Pada Anak Usia 4-5 Tahun Di TK Malaekat Pelindung Manado. *Jurnal Keperawatan*. 2014; 2(2).