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RESEARCH

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Risk Factors Related to Stunting

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Abstract

Childhood stunting, or low height for age, continues to be a concern for world health since it raises the possibility of both mortality and growth and development disorders. West Kalimantan province ranks seventh with the highest prevalence of 29.8% by 2021. But little is known about Pontianak's children's stunting risk factors, especially in the UPT Puskesmas Pal Lima (one of the community health centers with a high prevalence of stunting). The study aimed to determine risk factors associated with stunting in the UPT Puskesmas Pal Lima, such as high-risk pregnant women, pregnant women with chronic energy deficiency, communication of educational information about stunting, occupancy density, and age of pregnant women in the UPT Puskesmas Pal Lima. Cross-sectional study design was used. The research was conducted in February-March 2023. The population in this study were all stunted toddlers in the UPT work area of the Pal Lima Health Center. Sampling used quota sampling with all 75 stunted toddlers. Data analysis used univariate and bivariate analysis (chi square test with 95% CI). This research found that 61,3% with high risk pregnant women, 21,3% with chronic energy deficiency, 52% not exposed to information communication and education about stunting, 32% occupancy density were not qualified, 48% risk at age of pregnant mothers, 32% severe stunting and 68% stunting. There was a significant relationship between high-risk pregnant women (p-value = 0,015), pregnant women with chronic energy deficiency (p-value = 0,001), the information communication and education about stunting (p-value = 0,046), occupancy density (p-value = 0,043), and the age of pregnant women (p-value = 0,049), and the incidence of stunting in toddlers in the working area of UPT Puskesmas Pal Lima, West Pontianak District. Based on the results of this study can be used as a basis for the primary prevention of stunting in pregnant women.

Keywords: High Risk Pregnant Women, Chronic Energy Deficiency, Information Communication Education about Stunting, Occupancy Density, Age of Pregnant Women Stunting.

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1. INTRODUCTION

Malnutrition that occurs at an early age can increase infant and child mortality, cause intelligence to decrease, and even result in long-term economic losses for a nation (Govender et al., 2021). Stunting is a condition where a child's height is too low compared to other children (Palino, Majid, & Ainurafiq, 2017). Stunting and severe stunted based on age namely height that is below minus two standard deviations ($<-2SD$) from the WHO child growth standard nutritional status table. Stunting has the impact of poor nutritional intake of both quality and quantity as well as high rates of pain. This condition is often found in states with poor economic conditions (Boucot & Poinar, 2018).

In 2020, there were approximately 149.2 million (22.0%) stunted children under the age of five worldwide, despite the fact that the frequency of stunting has consistently decreased over the past 20 years. In 2019, Asia accounted for over half of all stunted children under five, while Africa accounted for two out of every five. In Southeast Asia, stunting affects 25.8% of children under five (UNICEF, 2021). The problem that is still the focus of the government in Indonesia today is the problem of nutrition, which is characterized by high rates of stunting in children. Indonesia is ranked as the third country with the highest prevalence in the Southeast Asia/South-East Asia Regional (SEAR) region according to the prevalence of stunting news data collected by the World Health Organization (WHO). The average incidence of stopping news in Indonesia was 36.8% in 2010 or 35.6% and in 2013 the incidence increased to 37.2% consisting of 18% of severe stunting and 19.2% of stunting (Selvia & Wahyuni, 2022). Based on the stunting rate obtained from JME and the UNICEF World Bank in 2020, the stunting rate in Indonesia reached the 115th position out of 151 countries (Tobing et al., 2021). *Riskesdas* data (2018) show that 30,8% or around 7 million children under the age of 5, are stunted, which shows a fundamental difference from the WHO limit for reducing stunting cases which is a maximum of 20% (Kementerian Kesehatan Republik Indonesia, 2018). Therefore, Indonesia is included in the list of countries with high stunting problems.

The Province of West Borneo is ranked as the seven province with the highest prevalence of stunting after the Provinces of NTT, West Sulawesi, Aceh, NTB, North Sulawesi, and South Borneo, with a rate of 29,8% in 2021 (Indonesian The Ministry of Health, 2021). According to the 2022 Indonesian Nutritional Status Survey (SSGI), the prevalence of stunting in under-fives (height for age) in West Borneo Province reached 27,8% with the highest stunting prevalence occurring in the Melawi Regency area, reaching 44,1%, while in Pontianak City the stunting rate was 19,7% (Munira, 2023). The prevalence of nutritional status of children under five based on indicators of height and age in districts and cities in West Borneo Province in 2018 for the very short category was 11,4% and the short category was 21,9% (Kementerian Kesehatan Republik Indonesia, 2018).

Many factors influence the incidence of stunting in toddlers, so it is necessary to study the determinant factors that can affect the incidence of stunting to become a reference in tackling existing stunting problems. Several factors from parents that cause stunting can be seen in the condition of the mother during pregnancy as measured by the upper arm circumference (LILA), which describes chronic energy deficiency, or what is known as CED (Ruaida & Soumokil, 2018). Many other factors also affect children born short, and one that must be considered is the age of the mother during pregnancy. Mothers aged 21 years or >35 years have a high risk of health threats and death to the mother or the fetus during pregnancy or the puerperium (Sani et al., 2019). In addition, mothers who have high risks, such as having a history of hypertension in pregnancy, also affect the health of the fetus they contain (Pongrekun, Sunarsieh & Fatmawati, 2020). In previous studies, it was found that there was a relationship between maternal risk factors that could affect the growth and development of

children under five and cause stunting, such as pregnant women with Chronic Energy Deficiency (CED), low knowledge of the Information, Communication and Education model (ICE) about stunting, and the age of pregnant women who were too young or too old for the stunting incident (Wardani, 2022; Istiningsih & Riyanti, 2022).

Globally, a number of research have examined the connection between risk factors and stunting in children. Stunting is frequently associated with issues relating to the mother, child, household, and accessibility of services. Most people are aware that teenage mothers who become pregnant typically have underweight children, minimal maternal weight gain, and a significant risk of anemia (le Roux et al., 2019; Nabugoomu et al., 2018). Stunting in the toddlers can be caused by several factors, one of which is pregnancy (Najah & Darmawi, 2022). UPT Puskesmas Pal Lima is one of the public health centers in Pontianak City with a high prevalence of stunting, reaching 5,91%. The working area of the Pal Lima Health Center UPT is characterized by a densely populated community, most of whom live on the banks of the river, and a relatively low level of community education. However, little is known about how maternal characteristics and background contribute to child stunting in UPT Puskesmas Pal Lima, Pontianak City.

Emergency research stunting in UPT Puskesmas Pal Lima is supported by gap research in some previous research on risk factors related to stunting, but in some research only explain the risk factors of stunting from the condition of nutrition in the toddlers. Meanwhile, it is important to know that there are several other risk factors that can cause stunting. The purpose of this study was to determine the relationship between risk factors for stunting such as high-risk pregnant women, pregnant women with CED or ICE about stunting, occupancy density, and the age of pregnant women on stunting in toddlers. The benefit of this research is to provide information and add insight about the relationship between maternal risk factors and the incidence of stunting in toddlers.

2. RESEARCH METHOD

The research design used in this study is an analytic observational design using the cross-sectional method. This research was conducted to determine the relationship between maternal risk factors and the incidence of stunting in UPT Puskesmas Pal Lima. The population in this study were all stunted toddlers in the UPT work area of the Pal Lima Health Center. Sampling used quota sampling with all 75 stunted toddlers.

The dependent variable in this study is the incidence of stunting. Stunting is divided into two categories, namely severe stunting and stunting (using secondary data from the Pal Lima Community Health Center UPT). The independent variables in this study include high risk pregnant women (have a history of hypertension and other diseases or not), CED pregnant women (Upper Arm Circumference less or more than 23.5 cm), communication of information and education about stunting (exposed or not), occupancy density (qualified $>8m^2$ /person or unqualified $<8m^2$ /person), and age of pregnant women (less or more than 21 years old).

The type of data collected is primary data collected through interviews using a questionnaire measuring instrument that is distributed to mothers who have stunting toddlers and secondary data obtained through the Health Profile of the UPT Puskesmas Pal Lima. This research was conducted in the work area of UPT Puskesmas Pal Lima, West Pontianak District, in March-April 2023. Data analysis used univariate and bivariate analysis (chi square test with 95% CI). This research has also received research ethics permit from Public Health with No: 002/KEPK-FIKES/UMPONTIANAK/2023.

3. RESULTS AND DISCUSSION

Table 1. Show univariat analysis of stunting risk factors in UPT Puskesmas Pal Lima.

Variable	n	%
High Risk pregnant Women		
Risk of stunting	46	61,3
No risk of stunting	29	38,7
Nutritional Status of Pregnant Women		
With chronic energy deficiency	16	21,3
No chronic energy deficiency	59	78,7
Information Communication and Education about stunting		
Exposed	39	52,0
Not exposed	36	48,0
Occupancy Density		
Qualify	24	32,0
Not qualified	51	68,0
Age of Pregnant Women		
Less than 21 th	36	48,0
More than 21 th	39	52,0
Total	75	100,0

Source: Primer Data, 2023

The table showed based on univariate analysis it is concluded that the majority of high-risk pregnant mothers suffered stunting with a total of 46 people (61.3%), pregnant women with an arm circumference of less than 23.5 cm with a chronic energy deficiency category were 16 (21.3%); pregnant non-exposed mothers communicated educational information about stopping with 36 (48%). The majority of the population did not qualify for the population density of 51 people (68%) and the age of pregnant mothers less than 21 years old of 36 people (48%).

Table 2. Cross-tabulation of Risk Factors Associated with Stunting.

Variable	Stunting				p-value	PR (95% CI)
	Severe Stunting		Stunting			
	f	%	f	%		
High Risk Pregnant Women						
Yes	20	43.5	26	56.5	0.015	3.152 (1.198 – 8.296)
No	4	13.8	25	86.2		
Nutritional Status of Pregnant Women						
Upper Arm Circumference less than 23.5 cm	11	68.8	5	31.3	0.001	3.120 (1.742 – 5.588)
Upper Arm Circumference more than >23.5 cm	13	22.0	46	78.0		
Information Communication and Education about stunting						

No	17	43.6	22	56.4	0.046	2.242
Yes	7	19.4	29	80.6		(1.054 – 4.768)
Occupancy Density						
Qualified	12	50.0	12	50.0	0.043	2.125
Not Qualified	12	23.6	39	76.5		(1.125 – 4.015)
Age of Pregnant Women						
Less than 21 th	16	44.4	20	55.6	0.049	2.167
More than 21 th	8	20.5	31	79.5		(1.057 – 4.441)

Source: Primer Data, 2023

The table 2 showed that high-risk pregnant women had a significant association with the incidence of stunting in toddlers. Based, on Prevalence Ratio, it could be concluded that pregnant women are at risk of potentially experiencing stunting 3,152 more times in the very short category (severe stunting) compared to pregnant women who are not at risk. Maternal nutritional status during pregnancy was also significantly related to the incidence of stunting in children under five. Based in the Prevalence Ratio, it can be concluded that mothers who experience CED have the potential to experience stunting in the very short category (severe stunting) 3.120 more times than the mothers who do not experience CED. Mothers' knowledge had a significant relationship with the incidence of stunting in toddlers. Mothers who don't have good knowledge about stunting have a 2.242 times higher chance of having very short children (severe stunting) compared to mothers who have knowledge about stunting. Occupancy density is significantly related to the incidence of stunting in toddlers. The respondent which occupancy density not qualified had the potential to experience stunting in the very short category (severe stunting) 2.125 more times higher than the occupancy density qualified. Maternal age during pregnancy is significantly related to the incidence of stunting in infants. Pregnant women less than 21 years old have a 2.167 times greater chance of experiencing stunting in the very short category (severe stunting) compared to pregnant women more than 21 years old.

Relationship Between High-Risk Pregnant Women and Stunting. According to this study pregnant women who were at high-risk of severe stunting had a gestational age that was 13,8% higher than that of pregnant women who were not at risk for stunting, and statistical test results showed a significant relationship. Pregnancy hypertension is one of the elements that supports high-risk pregnant women, specifically, situations that put the mother at risk for difficulties during pregnancy or childbirth. Mothers who have a history of high blood pressure during pregnancy run the danger, such as kidney, liver, or heart failure due to cerebral bleeding (Cunningham & LaMarca, 2018). This can potentially result in a significant delay in the onset of consciousness for a considerable amount of time (Widyaningsih & Dewi, 2021).

A decrease in uteroplacental circulation could be brought on by high blood pressure during pregnancy because it can make the lining of the arteries stiff and prevent distention and vasodilation from happening (Hu & Zhang, 2021). Decreased uteroplacental circulation can also result in blood flow and nutrient flow to the placenta not being optimal, which can inhibit fetal growth and cause complications in the fetus such as low birth weight and premature birth (Safitri & Djaiman, 2021). Low Birth Weight (LBW) is a sign that the fetus was malnourished while it was growing inside the mother, and stunting is a symptom of chronic or long-term malnutrition. Compared to women who don't suffer hypertension during pregnancy, mothers who do have it throughout pregnancy run a 4.086 times higher chance of giving birth to toddlers who are stunted (Wardani, 2022). Stunting is 4.967 times more likely to occur in infants whose

mothers had a history of hypertension during pregnancy than it is in mothers without such a history (Nengsih & Wirastuti, 2020).

The findings of this research can be used as a reference in early prevention programs for stunting in pregnant women, especially in pregnant women with high blood pressure. Appropriate intervention and assistance is needed so that it can reduce existing risks (Fitriani et al., 2020).

Relationship Between Nutritional Status of Pregnant Women and Stunting. The rate of Chronic Energy Deficiency (CED) among pregnant women in the very short group was 68,8% greater than the rate among pregnant women who didn't have CED, which was lower by 22,0% and the prevalence of stunting in toddlers and mothers' nutritional status during pregnancy are related. The upper arm on the region of the hand not used for daily activities can be used to observe or measure pregnant women who are classified as having Chronic Energy Deficiency (CED) with an arm circumference of less than 23,5 cm (Khairunisa et al., 2022). The upper arm's circumference can provide information about the health of the underlying fat and muscle tissue. Finding out whether pregnant women fall into the CED category or the normal category is the goal of the upper arm's circumference measurement. It's crucial to do this activity in order to understand the potential risk of stunting (Rohmawati et al., 2020).

The mother's nutritional status both before and throughout pregnancy has a significant impact on how the fetus develops inside the mother. However, if the mother's nutritional health before and during pregnancy is adequate, it is likely that she will give birth to a healthy, full-term baby who weighs a normal amount. Therefore, it can be said that the quality of the fetus is greatly influenced by the mother's nutritional health status before and during pregnancy (Ibrahim et al., 2019). Therefore, Low Birth Weight (LBW) and Short Birth Length (SBL) in the newborn are likely if the baby's development is less than ideal in pregnant women with CED. Pregnant women with chronic energy deficiency may not have enough nutritional reserves to meet the physiological demands of pregnancy, such as hormonal changes, and may increase blood volume for fetal growth, which reduces the fetus's access to nutrients and stunts its growth and development during pregnancy. Stunted in the womb, low body weight, short or even very short height, or growth retardation (Eka et al., 2021). The findings of this study are in line with previous studies (Ruaida & Soumokil, 2018; Alfarisi et al., 2019).

Relationship Between Information, Communication and Education About Stunting and Stunting. Women who had never received information, communication and education about stunting scored 43,6% higher in the extremely short group than mothers who had (19,4%). We can draw the conclusion that the occurrence of stunting in toddlers was correlated with women who don't obtain communication of education information. Stunting is caused by a poor socio-economic background and a lack of education (Murti et al., 2020). The prevention of stunting and raising toddlers parents' knowledge and awareness of the value of child growth and development in overcoming stunting are essential goals of communication, information and education.

One of the factors contributing to moms' lack of knowledge, particularly in the area of education, a mother's knowledge may be impacted by her poor level of schooling. The nutritional status of children can be improved thanks to mothers' awareness. Knowing that it is inadequate will change a mother's perspective and conduct when it comes to feeding the toddlers healthy food (Saragih et al., 2020). Furthermore, having a toddler with a proper nutritional status doesn't always result from a mother who is knowledgeable. Mothers who are well-informed are expected to be able to use their knowledge in real life. Additionally, because a mother controls a toddler's entire food intake, the mother's parenting style also affect the likelihood of stunting in toddlers. As a result, it's important to educate moms of toddlers about

stunting so that they can improve their awareness of the condition and their parenting abilities and keep their children's growth and development on track for health (Amalia et al., 2021; Olsa et al., 2018; Samiati et al., 2022).

Relationship Between Occupancy Density and Stunting. The occupancy density in the very short category that complied with the regulations was 50.0% greater than the density that didn't, which was 23,5% and the prevalence of stunting in toddlers and occupancy density are related. The state of the environment today is something that still requires attention because it has the potential to impact the community's level of health. One of them is occupancy density, which includes access to clean water, trash removal, waste management, and private latrine ownership. Occupational density is defined as the ratio of the number of occupants to the square footage (m²) of the room occupied by the patient, with a minimum need of 8 m²/patient. The occupancy density standards were not met by 51 of the 75 respondent.

Based on the fact that 76,5% of toddlers in the short category and 23,6% of those who are very short are stunted, the average toddler who is stunted comes from a home with a poor environment. Research findings in the West Pontianak Subdistrict, where UPT Puskesmas Pal Lima is located, reveal that environmental conditions are still very poor, particularly in terms of residential density and its effects on latrine ventilation, waste processing, and the prevalence of for consumption in daily life can have an impact in health and nutritional status, particularly malnutrition, while simultaneously preventing the development of disease. The presence of various diseases is made possible by the density of residents who don't fulfill minimum health standards. Toddlers' nutritional status is significantly impacted by the state of the home. Stunting in toddlers can be reduced or even avoided with good environmental sanitation. According to studies done in the Samarinda seberang district, there is a direct correlation between environmental factors and the prevalence of stunting in young children (Cleopatra et al., 2018; Zahrawani et al., 2022).

Relationship Between the Age of Pregnant Women and Stunting. The age of pregnant women under 21 years old with a very short category was found to be 44,4% lower than that of pregnant women over 21 years, at 20,5% and the likelihood of stunting in toddlers is correlated with the age of pregnant women. The mother's age has a strong correlation with birth weight; when the mother is still young or under 21 years old, the development of the reproductive organs and physiological processes is still not optimal. Additionally, psychologically speaking, it is not development enough for the mother to handle pregnancy completely, and issues frequently arise. The frequency of preeclampsia and inadequate fetal growth are directly connected to the risk of pregnancy in women who gives birth at ages between 21 and 35 years old (Sari & Sartika, 2021).

The mother is too young to be pregnant, which raises the possibility of an early delivery, uterine growth impairment, and possibly mortality for both the mother and the fetus. When compared to the ideal pregnancy age (21-53 years), young moms typically have low nutritional conditions (Dewey, 2016). Premature newborns, chromosomal abnormalities and uterine growth retardation are all high-risk pregnancy outcomes for pregnant women who are too old (Fall et al., 2015). Malnutrition and other growth deficits that may result in stunting are likely to be caused by this, which will have an impact on children's growth and development (Pusmaika et al., 2022; Wanimbo & Wartiningsih, 2020; Nurhidayati, Rosiana & Rozikhan, 2015).

4. CONCLUSION

There is a relationship between risk factors such as high-risk pregnant women, pregnancies with chronic energy deficiency (CED), communication of educational information about stunting, labor intensity and the age of pregnant mothers with stunting. It is recommended

for UPT Puskesmas Pal Lima to improve information communication and education to the community related to stunting, while for parents is expected to the pregnant mother at high risk to check herself routinely, to know the condition of LILA to prevent the occurrence of Chronic Energy Deficiency (CED), meet the standard conditions of housing density, and determine the age of pregnancy matured is >21 years and increase care for the growth of toddlers by meeting the nutritional needs of toddlers.

REFERENCES

- Alfarisi, R., Nurmalasari, Y., & Nabilla, S. (2019). Status Gizi Ibu Hamil Dapat Menyebabkan Kejadian Stunting Pada Balita. *JKM (Jurnal Kebidanan Malahayati)*, 5(3), 271-278. <https://doi.org/10.33024/jkm.v5i3.1404>
- Amalia, I. D., Lubis, D. P. U., & Khoeriyah, S. M. (2021). Hubungan Pengetahuan Ibu tentang Gizi Dengan Kejadian Stunting Pada Balita: Relationship Between Mother's Knowledge on Nutrition and The Prevalence of Stunting on Toddler. *Jurnal Kesehatan Samodra Ilmu*, 12(2), 146–154. <https://doi.org/10.55426/jksi.v12i2.153>
- Boucot, A., & Poinar Jr., G. (2018). Stunting. *Fossil Behavior Compendium*, 5, 243–243. <https://doi.org/10.1201/9781439810590-c34>
- Cleopatra, A. B., Fitriangga, A., & Fahdi, F. K. (2018). Faktor – Faktor Yang Berhubungan Dengan Penggunaan Rokok Elektrik Di Wilayah Kecamatan Pontianak Barat. *ProNers*, 4(1), 1–10.
- Cunningham, M. W., & LaMarca, B. (2018). Risk of cardiovascular disease, end-stage renal disease, and stroke in postpartum women and their fetuses after a hypertensive pregnancy. *American Journal of Physiology-Regulatory, Integrative and Comparative Physiology*, 315(3), R521–R528. <https://doi.org/10.1152/ajpregu.00218.2017>
- Dewey, K. G. (2016). Reducing stunting by improving maternal, infant and young child nutrition in regions such as South Asia: Evidence, challenges and opportunities. *Maternal and Child Nutrition*, 12, 27–38. <https://doi.org/10.1111/mcn.12282>
- Eka, M. B., Krisnana, I., & Husada, D. (2021). Risk Factors of Stunting Events in Toddlers Aged 24-59 Months. *Indonesian Midwifery and Health Sciences Journal*, 4(4), 374–385. <https://doi.org/10.20473/imhsj.v4i4.2020.374-385>
- Fall, C. H. D., Sachdev, H. S., Osmond, C., Restrepo-Mendez, M. C., Victora, C., Martorell, R., Stein, A. D., Sinha, S., Tandon, N., Adair, L., Bas, I., Norris, S., Richter, L. M., Barros, F. C., Gigante, D., Hallal, P. C., Horta, B. L., Ramirez-Zea, M., Bhargava, S. K., ... Stein, A. (2015). Association between maternal age at childbirth and child and adult outcomes in the offspring: A prospective study in five low-income and middle-income countries (COHORTS collaboration). *The Lancet Global Health*, 3(7), e366–e377. [https://doi.org/10.1016/S2214-109X\(15\)00038-8](https://doi.org/10.1016/S2214-109X(15)00038-8)
- Fitriani, H., R, A. S., & Nurdiana, P. (2020). Risk Factors of Maternal Nutrition Status During Pregnancy to Stunting in Toddlers Aged 12-59 Months. *Jurnal Keperawatan Padjadjaran*, 8(2), 175–183. <https://doi.org/10.24198/jkp.v8i2.1305>
- Govender, I., Rangiah, S., Kaswa, R., & Nzaumvila, D. (2021). Malnutrition in children under the age of 5 years in a primary health care setting. *South African Family Practice*, 63(1), a5337. <https://doi.org/10.4102/safp.v63i1.5337>
- Hu, X., & Zhang, L. (2021). Uteroplacental Circulation in Normal Pregnancy and Preeclampsia: Functional Adaptation and Maladaptation. *International Journal of Molecular Sciences*, 22(16), 8622. <https://doi.org/10.3390/ijms22168622>
- Ibrahim, I. A., Bujawati, E., Syahrir, S., Adha, A. S., & Mujahida, M. (2019). Analisis determinan kejadian Growth failure (Stunting) pada anak balita usia 12-36 bulan di

- wilayah pegunungan desa Bontongan Kecamatan Baraka Kabupaten Enrekang. *Al-Sihah: The Public Health Science Journal*, 11(1), 50–64.
- Indonesian The Ministry of Health. (2021). *Results of the Indonesian Gizi Status Study (SSGI) National level, Province, District/City in 2021*. Indonesian The Ministry of Health
- Istiningsih, T., & Riyanti, R. (2022). Maternal Risk Factors Against Stunting Balita Aged 12 – 24 Months In Puskesmas Mantangai District of Kapuas Province of Kalimantan. *Malahayati Nursing Journal*, 4(7), 1828–1838. <https://doi.org/10.33024/mnj.v4i7.6673>
- Khairunisa, R., Mitra, M., Purba, C. V. G., Alamsyah, A., & Abidin, A. R. (2022). Faktor Risiko Ibu pada Saat Hamil dengan Kejadian Stunting pada Anak Balita di Kota Pekanbaru. *Jurnal Kesehatan Global*, 5(3), 150-160.
- le Roux, K., Christodoulou, J., Stansert-Katzen, L., Dippenaar, E., Laurenzi, C., le Roux, I. M., Tomlinson, M., & Rotheram-Borus, M. J. (2019). A longitudinal cohort study of rural adolescent vs adult South African mothers and their children from birth to 24 months. *BMC Pregnancy and Childbirth*, 19(1), 24. <https://doi.org/10.1186/s12884-018-2164-8>
- Munira, S. L. (2023). *Hasil Survei Status Gizi Indonesia (SSGI) 2022*. Jakarta: Kementerian Kesehatan Republik Indonesia.
- Murti, L. M., Budiani, N. N., & Darmapatni, M. W. G. (2020). Hubungan pengetahuan ibu tentang gizi balita dengan kejadian stunting anak umur 36-59 bulan di Desa Singakerta Kabupaten Gianyar. *Jurnal Ilmiah Kebidanan (The Journal Of Midwifery)*, 8(2), 62-69.
- Nabugoomu, J., Seruwagi, G., Corbett, K., Kanyesigye, E., Horton, S., & Hanning, R. (2018). Needs and Barriers of Teen Mothers in Rural Eastern Uganda: Stakeholders' Perceptions Regarding Maternal/Child Nutrition and Health. *International Journal of Environmental Research and Public Health*, 15(12), 2776. <https://doi.org/10.3390/ijerph15122776>
- Najah, S., & Darmawi, D. (2022). Hubungan Faktor Ibu Dengan Kejadian Stunting Di Desa Arongan Kecamatan Kuala Pesisir Kabupaten Nagan Raya. *Jurnal Biology Education*, 10(1), 45-55. <https://doi.org/10.32672/jbe.v10i1.4234>
- Nengsih, Y., & Warastuti, D. (2020). Faktor Risiko Kejadian Stunting Pada Bayi Dan Balita Di Desa Ciambar Kecamatan Ciambar Kabupaten Sukabumi Tahun 2019. *Jurnal Kesehatan Dan Kebidanan (Journal of Health and Midwifery)*, 9(1), 1-11.
- Nurhidayati, T., Rosiana, H., & Rozikhan, R. (2020). Usia Ibu Saat Hamil Dan Kejadian Stunting Pada Anak Usia 1-3 Tahun. *Midwifery Care Journal*, 1(5), 122-126.
- Olsa, E. D., Sulastri, D., & Anas, E. (2018). Hubungan sikap dan pengetahuan ibu terhadap kejadian stunting pada anak baru masuk Sekolah Dasar di kecamatan Nanggalo. *Jurnal Kesehatan Andalas*, 6(3), 523-529. <https://doi.org/10.25077/jka.v6i3.733>
- Palino, I. L., Majid, R. & Ainurafiq, A. (2017). *Determinan Kejadian Stunting pada Balita Usia 12-59 Bulan di Wilayah Kerja Puskesmas Puuwatu Kota Kendari Tahun 2016*. *Jurnal Ilmiah Mahasiswa Kesehatan Masyarakat Unsyiah*, 2(6), 1-12.
- Pongrekun, P.S., Sunarsieh & Fatmawati. (2020). Faktor-Faktor Yang Berhubungan Dengan Kejadian Stunting Di Kabupaten Konawe Selatan: Factors That Are Related To Stunting Events In South Konawe District. *Jurnal Ilmiah Kebidanan (Scientific Journal of Midwifery)*, 6(2), 95-104.
- Pusmaika, R., Novfrida, Y., Simatupang, E. J., Djami, M. E., & Sumiyati, I. (2022). Hubungan Usia Ibu Saat Hamil dengan Kejadian Stunting Pada Balita di Kabupaten Tangerang. *Indonesian Health Issue*, 1(1), 49-56. <https://doi.org/10.47134/inhis.v1i1.11>
- Kementerian Kesehatan Republik Indonesia. (2018). *Hasil Utama Riset Kesehatan Dasar 2018*. Jakarta: Kementerian Kesehatan Republik Indonesia.
- Rohmawati, W., Wintoro, P. D., & Sari, T. W. (2020). Hubungan Kekurangan Energi Kronik pada Ibu Hamil dengan Kejadian Stunting di Klaten. *MOTORIK Jurnal Ilmu Kesehatan*,

- 3(1), 39–44.
- Ruaida, N., & Soumokil, O. (2018). Hubungan status KEK ibu hamil dan BBLR dengan kejadian stunting pada balita di puskesmas Tawiri kota Ambon. *Jurnal Kesehatan Terpadu (Integrated Health Journal)*, 9(2), 1-7. <https://doi.org/10.32695/jkt.v2i9.12>
- Safitri, A., & Djaiman, S. P. H. (2021). Hubungan hipertensi dalam kehamilan dengan kelahiran prematur: Metaanalisis. *Media Penelitian dan Pengembangan Kesehatan*, 31(1), 27–38. <https://doi.org/10.22435/mpk.v31i1.3881>
- Samiati, Amin F.A. & Ramadhaniah. (2022). Hubungan Pola Asuh, Pendidikan Ibu, Pengetahuan Ibu Dan Riwayat Penyakit Infeksi Dengan Kejadian Stunting Pada Balita Usia 12-24 Bulan Di Wilayah Kerja Puskesmas Rundeng Kota Subulussalam Tahun 2021. *Journal of Health and Medical Science*, 1(4), 216-223.
- Sani, M., Solehati, T., & Hendrawati, S. (2019). Hubungan usia ibu saat hamil dengan stunted pada balita 24-59 bulan. *Holistik: Jurnal Kesehatan*, 13(4), 284-291.
- Saragih, F. L., Simanjuntak, Y. T., & Hutajulu, J. (2020). Hubungan Pengetahuan Keluarga Dengan Tindakan Pencegahan Stunting Di Desa Perk. Aek Tarum Kecamatan Bandar Pulau Kabupaten Asahan Tahun 2020. *Jurnal Teknologi Kesehatan Dan Ilmu Sosial (Tekesnos)*, 2(2), 20-29.
- Sari, K., & Sartika, R. A. D. (2021). The effect of the physical factors of parents and children on stunting at birth among newborns in indonesia. *Journal of Preventive Medicine and Public Health*, 54(5), 309–316. <https://doi.org/10.3961/jpmph.21.120>
- Selvia, D., & Wahyuni, A. (2022). Wahyuni, A. (2021). Manajemen General Anestesi Pada Pasien Splenomegali. *Jurnal Kesehatan Saintika Meditory*, 4(2), 78-84. <http://dx.doi.org/10.30633/jsm.v4i2.1270>
- Tobing, M. L., Pane, M., & Harianja, E. (2021). Pola Asuh Ibu Dengan Kejadian Stuntingpada Anak Usia 24–59 Bulan di Wilayah Kerja Puskesmas Kelurahan Sekupang Kota Batam. *Jurnal Kesehatan Masyarakat*, 5(1), 448-465. <https://doi.org/10.31004/prepotif.v5i1.1630>
- UNICEF. (2021). *UNICEF-WHO-World Bank: Joint Child Malnutrition Estimates—2021 Edition Interactive Dashboard*. UNICEF. Retrieved from <https://data.unicef.org/resources/joint-child-malnutrition-estimates-interactive-dashboard-2021>
- Wanimbo, E., & Wartiningsih, M. (2020). Wanimbo, E., & Wartiningsih, M. (2020). Hubungan karakteristik ibu dengan kejadian stunting baduta (7-24 bulan). *Jurnal Manajemen Kesehatan Yayasan RS. Dr. Soetomo*, 6(1), 83. <https://doi.org/10.29241/jmk.v6i1.300>
- Wardani, D. K. (2022). Pengaruh Faktor Maternal Ibu terhadap Kejadian Stunting pada Balita Usia 24-59 Bulan di Wilayah kerja UPT Puskesmas Sopaah Kabupaten Pamekasan The Influence of Maternal Factors on The Incidence of Stunting among Toddlers Aged 24–59 Months in Working Area of Sopaah Primary Health Care, Pamekasan District. *Media Gizi Kesmas*, 11(02), 386-393. <https://doi.org/10.20473/mgk.v11i2.2022.386-393>
- Western Health. (2020). *Western Health Research Reports*. Western Health.
- Widyaningsih, W., & Dewi, I. P. (2021). Hubungan Tekanan Darah Tinggi Dengan Kejadian Stunting Pada Anak. *MAHESA: Malahayati Health Student Journal*, 1(4), 333-344. <https://doi.org/10.33024/mahesa.v1i4.5476>
- Zahrawani, T. F., Nurhayati, E., & Fadillah, Y. (2022). Hubungan kondisi jamban dengan kejadian stunting di Puskesmas Cicalengka Tahun 2020. *Jurnal Integrasi Kesehatan dan Sains (JIKS)*, 4(1), 1–5. <https://doi.org/10.29313/jiks.v4i1.7770>