Setiawati, I., Qomari, S. N. & Daniati, D. (2026)
Jurnal Keperawatan Soedirman – Vol 21, No 1 page 21-26
http://jos.unsoed.ac.id/index.php/jks/index

ORIGINAL ARTICLE

EARLY DETECTION OF MATERNAL RISK FACTORS FOR STUNTING IN INFANTS

Iin Setiawati[1]*, Selvia Nurul Qomari[2], Dana Daniati[3]

1. Midwifery professional study program, Noor Huda Mustofa University, Jl RE Martadinata no 45 Mlajah, Bangkalan, East Java, Indonesia
2. Bachelor of Midwifery Program, Noor Huda Mustofa University, Jl RE Martadinata no 45 Mlajah, Bangkalan, East Java, Indonesia
3. Midwifery professional study program, Noor Huda Mustofa University, Jl RE Martadinata no 45 Mlajah, Bangkalan, East Java, Indonesia

Article Information
Received: 10 October 2025
Revised: 28 Desember 2025
Accepted: 25 February 2026

***Corresponding Author**
Iin Setiawati
iensetia@gmail.com

DOI
10.20884/1.jks.2026.21.1.17983

ABSTRACT

Stunting can develop while fetus is still in womb and is only visible in infants at two years of age. Indonesia's stunting rate reached 19.8% in 2024, which is still higher than government's target of below 14%. This study aims to identify maternal risk factors for stunting. This retrospective study applied a quantitative analysis approach. A total of 323 mothers participated in this study, and researchers used Early Detection of Low-Birth-Weight Risk Scorecard (EDBLWRSC) and Dhiana Setyorini Scorecard (DSSC) to collect data. The analyzed using Chi-square tests with an α of 0.05. The results revealed that stunting was associated with parity item of DSSC (ρ = 0.00) and a history of preeclampsia (ρ = 0.00). Meanwhile, obesity was associated with either outcome. Moreover, in EDBLWRSC, anemia was associated with stunting (ρ = 0.00), a history of low birth weight was associated with a higher incidence of low birth weight (ρ = 0.01). The maternal risk variable on DSSC and stunting (ρ = 0.00) had an OR of 2.2 and 3.3, respectively. The EDBLWRSC also revealed a relationship between maternal risk factors and stunting (ρ = 0.00). Therefore, some of maternal risk factors in DSSC and EDBLWRSC are associated with stunting.

Keywords: *Early detection; Maternal risk factors; Stunting*

ISSN : 1907-6637 **e-ISSN : 2579-9320**

BACKGROUND

Stunting is a condition caused by chronic malnutrition, in which inadequate nutrient intake over extended periods can lead to deficiencies in essential nutrients. Chronic starvation or undernutrition from the fetal stage to the early childhood life (the first 1,000 days of life) may result in stunting. However, although stunting could start during the fetal period, it may only become apparent when the child reaches two years old (UNICEF et al., 2023).

Stunting is a significant public health problem in Indonesia. According to the Indonesian Nutrition Status Survey (SSGI) in 2024, the country's stunting prevalence was 19.8%. Although this statistic shows a decline from previous years, this remains far from the government's target of reducing stunting to below 14% by 2024 (Bangkalan, 2024). At the regency level in Bangkalan, East Java, Arosbaya subdistrict has a stunting prevalence of 32.25%, Bangkalan has 11.96%, Geger has 14.67%, and Kokop has 12.89%. These four areas have the highest stunting rates in Bangkalan Regency (Bangkalan, 2024).

There are several causes of stunting, including environmental, maternal, and child-related factors. Maternal factors that may contribute to stunting include the mother's height, upper arm circumference, history of illness, breastfeeding practice, and age during pregnancy, specifically if the mother is under 20 years old. Child factors include a history of low birth weight (LBW) or prematurity, male infants, and infants who do not receive immunizations. Other factors include low socioeconomic status, the family's education level, especially poor education among mothers (Adriani et al., 2022; Kurniati et al., 2022; Nikmah et al., 2020).

Efforts to reduce stunting rates should start during

pregnancy. High- quality and continuous antenatal care, with at least 6 visits during pregnancy, is essential to prevent stunting. These visits allow healthcare workers to monitor the maternal and fetal conditions and enable the early detection of pregnancy complications, such as preeclampsia and low birth weight (LBW). Numerous studies have demonstrated that low birth weight and pregnancy difficulties affect stunting prevalence in infants. Moreover, both preeclampsia and LBW contribute to intrauterine growth restriction, which can lead to the increase of the risk of stunting (Setyorini & Cahyono, 2022).

Research shows that LBW is the most significant risk factor for stunting. Infants with LBW are 5.87 times more likely to experience stunting. Infants with LBW will experience delays in their growth and development because LBW babies have experienced intrauterine growth retardation since they were in the womb, which will continue after they are born (Tahangnacca et al., 2020).

Early detection of pregnancy complications during the prenatal check- up is essential. Preeclampsia can be detected using the Dhiana Setyorini Scorecard (DSSC), while the risk of LBW can be determined by the Early Detection of Low-Birth-Weight Risk Scorecard (EDLBWRSC). However, although the DSSC and EDLBWRSC are essential screening tools, they are not yet widely implemented in medical facilities to determine whether pregnant women are having high-risk pregnancies or not. Meanwhile, healthy pregnant women and babies are critical to creating a healthy, high-quality generation, which can indirectly prevent stunting in infants (Primanto & Puspitasari, 2024; Setyorini & Cahyono, 2022).

The early detection of preeclampsia can be assessed using the Dhiana Setyorini Scorecard (DSSC), and LBW birth risk can be determined using the LBW Risk Early Detection Scorecard (EDLBWRSC). These tests can be conducted by midwives, who are health workers who monitor maternal health during pregnancy. Both the DSSC and EDLBWRSC use simple language and do not require specific tools. The DSSC and EDLBWRSC are also paper-based forms that cadres, other community health volunteers, and pregnant women can easily use. This study aims to explore the early identification of maternal risk factors that may lead to stunting in their newborn infants (Setyorini & Cahyono, 2022).

METHOD

Study design

This study employed an analytical, retrospective design to identify fetal and maternal risk factors associated with stunting in Bangkalan. The cases of stunting experienced by infants were traced back to their mothers' pregnancy history.

Sample of participants

This study was conducted in several locations in Bangkalan District (Arosbaya, Bangkalan, Geger, and Kokop) from June to July 2025. The study population comprised 1,686 mothers with infants experiencing stunting. The researchers used a formula to determine the sample size, which yielded 323 mothers. The inclusion criteria for mothers were those with infants aged 2-5 years, who had a mother and child health (MCH) book, Mothers with chronic conditions such as diabetes, hypertension, heart disease, HIV/AIDS, or active tuberculosis. Mothers experiencing severe pregnancy complications, and those who agreed to participate in the survey. Mothers whose infants had a history of seizures, congenital conditions, metabolic problems, or infectious infections were excluded.

Instrument

This research used the Early Detection of Low-Birth-Weight-Risk Scorecard (EDLBWRSC), which consists of the following items: education level, history of infection during pregnancy, history of low birth weight, premature pregnancy, pregnancy interval < 24 months, maternal chronic energy deficiency (CED) [malnutrition], hypertension/preeclampsia during pregnancy, anemia, multiple pregnancies, IUGR, and the Dhiana Setyorini Scorecard (DSSC), which consists of the following items: income < minimum wage, more than one pregnancy, a family history of pregnancy complications, age < 20 or > 35, a history of diabetes mellitus (DM), high blood pressure, obesity (BMI > 25), and pregnancy problem (Setyorini & Cahyono, 2022). According to the results of the test, every single question that was submitted had a value that was greater than 0.5. If the results of the reliability test show that the variable has a Cronbach's alpha score that is greater than 0.958, then it is possible to assert that the variable is reliable or consistent in terms of measurement. In general, the study questionnaire that was constructed based on the model used by the Ministry of Health proved both validity and reliability. The credibility of the procedures used to collect data for the study is improved as a result of these findings Setyorini et al., 2019)

Data collection

After the questionnaire data were collected, responses were scored based on the interview answers and summed to obtain total scores. For Dhiana Setyorini's scorecard, a total score of less than 8 indicates a low-risk pregnancy. Meanwhile, a total score greater than 8 is classified as a high-risk pregnancy. The Early Detection of Low-Birth-Weight Risk Scorecard classifies a case as low-risk if its total score is less than 4.5 and as high risk if it is greater than 4.5. Following the scoring process, data coding and tabulation were conducted.

Data analysis

The Chi-square test with α of 0.05 was used to analyze the research data.

Ethical consideration

This research obtained the following ethical approval number: 2698/KEPK/UNIV-NHM/EC/VI/2025.

RESULT

Table 1. Cross-tabulation of Risk Factors on Dhiana Setyorini's Scorecard (DSSC) with Stunting Incidence n: 323

DSSC items	Stunting	No stunting	Sig	OR
Income				
< RMW (< 2.000.000/month)	94 (29.1%)	217 (67.2%)	0.52	0.64
≥ RMW (≥ 2.000.000/month)	5 (1.5%)	7 (22%)		
Parity				
Pregnant once	12 (3.7%)	77 (23.8%)	0.00	0.24
Pregnant more than once	77 (23.8%)	118 (36.7%)		
Prenatal poisoning				
There are descendants	89 (27.6%)	183 (56.7%)	0.02	1.80
There are no descendants	0 (0%)	12 (3.7%)		

DSSC items	Stunting	No stunting	Sig	OR
Mother's age				
20-35 years old	61 (18.9%)	153 (47.4%)	0.07	0.60
< 20 years old or > 35 years old	28 (8.7%)	42 (13%)		
History of high blood pressure				
Yes	9 (2.8%)	12 (3.7%)	0.23	1.73
No	80 (24.8%)	183 (56.7%)		
Overweight (BMI >25)				
Yes	13 (4.1%)	8 (2.5%)	0.00	4.04
No	76 (23.5%)	187 (57.9%)		
History of preeclampsia				
Yes	5 (1.5%)	17 (5.4%)	0.47	0.59
No	84 (26%)	178 (55.1%)		
History of diabetes mellitus (DM)				
Yes	14 (4.4%)	26 (8.1%)	0.58	1.22
No	75 (23.3%)	169 (52.3%)		

Table 1 shows that, among the DSSC risk factors, most of the sample had incomes below the regional minimum wage (RMW), yet their infants did not experience stunting (217 infants, or 67.2% of the sample). The results also showed there is no correlation between income and stunting incidence (ρ = 0.52). Research results show parity was found to have a significant association with stunting (ρ = 0.00), as 77 mothers (23.8%) with multiple pregnancies had infants who were stunted.

Next, the results showed that most mothers with preeclampsia have stunted infants (89 mothers or 27.6% of the sample). Stunting incidence was significantly correlated with preeclampsia (ρ = 0.00). In terms of maternal age, 153 women (47.4%) between the ages of 20 and 35 years old did not have stunted infants, and no correlation was found between maternal age and stunting (ρ = 0.07). Regarding a history of hypertension, most mothers (56.7%) with a history of hypertension did not have stunted infants. Stunting was also not associated with a history of elevated blood pressure (ρ = 0.23). In contrast, stunting was linked to obesity (ρ = 0.00); most of the mothers who were not obese (BMI < 25) did not have stunted infants (57.9%).

Furthermore, the 178 mothers (55.1%) who did not have a history of preeclampsia did not have stunted infants. Stunting incidence was also found not correlated with a history of preeclampsia (ρ = 0.47). Similarly, most mothers without a history of diabetes mellitus (DM) did not have stunted infants, and stunting was not significantly associated with a history of diabetes mellitus (DM) (ρ = 0.58).

Table 2. Cross-tabulation of Risk Factors on the Early Detection of Low Birth Weight Risk Scorecard (EDLBWRSC) with Stunting Incidence n: 323

EDLBWRSC items	Stunting	No stunting	Sig	OR
Education				
High	19 (5.9%)	54 (16.7%)	0.38	0.75
Low	80 (24.8%)	170 (52.6%)		
Infection during pregnancy				
No	89 (27.6%)	206 (63.8%)	0.57	0.77
Yes	10 (3.1%)	18 (5.5%)		
History of LBW				
No	80 (24.8%)	204 (63.2%)	0.01	0.41
Yes	19 (5.9%)	20 (6.1%)		
Premature pregnancy				
No	99 (30.7%)	219 (67.8%)	0.32	0.68
Yes	0 (0%)	5 (1.5%)		
Pregnancy interval				
> 24 months	80 (24.8%)	194 (60.1%)	0.18	0.64
< 24 months	19 (5.9%)	30 (9.2%)		
Mrs. KEK				
No	59 (18.3%)	144 (44.5%)	0.45	0.82
Yes	40 (12.4%)	80 (24.8%)		
Hypertension/preeclampsia during pregnancy				
No	89 (27.6%)	184 (56.9%)	0.09	1.94
Yes	10 (3.1%)	40 (12.4%)		
Anemia				
Yes	14 (4.4%)	26 (8.1%)	0.00	1.22
No	75 (23.3%)	169 (52.3%)		

Table 2 shows the risk factors assessed using the Early Detection Scorecard for Low-Birth-Weight Risk. In terms of education, most mothers with low education did not have stunted infants (52.6%). Maternal education was not associated with stunting incidence (ρ = 0.38). Regarding infection during pregnancy, most mothers who did not experience infection during pregnancy did not have stunted infants (63.8%). Accordingly, infection during pregnancy was not associated with stunting (ρ = 0.57).

Furthermore, the results showed that most mothers without a history of delivering a LBW infant did not have stunted infants (63.2%). Conversely, a history of giving birth to LBW infants was associated with an increased incidence of LBW (ρ =

0.01). Meanwhile, most mothers who did not experience preterm birth (67.8%) did not give birth to infants who were stunted. Thus, stunting was not linked to premature birth (ρ = 0.32).

Regarding birth interval, most mothers with an interval of over 24 months did not have stunted infants (60.1%). Nevertheless, no significant association between stunting and birth spacing (ρ = 0.18). Next, approximately half of the sampled pregnant women without energy-calorie deficiency (ECD) had infants who did not suffer from stunting (44.5%). Thus, maternal ECD was not associated with stunting incidence (ρ = 0.45).

The cross-tabulation results show, most mothers with hypertension/preeclampsia during pregnancy were found to not have stunted infants (56.9%) and statistical test showed that hypertension /preeclampsia during pregnancy was not associated with stunting (ρ = 0.09). Most mothers without anemia also did not experience stunting in their infants (52.3%) and the statical test revealed that anemia was associated with stunting (ρ = 0.00).

Table 3. Cross-tabulation of the Dhiana Setyorini Scorecard (DSSC) and the Early Detection of Low Birth Weight Risk Scorecard (EDLBWRSC) with Stunting Incidence n: 323

DSSC	Stunting	No stunting	Sig	OR
Low risk	79 (24.5%)	145 (44.9)	0.00	2.2
High risk	20 (6.1%)	79 (24.5%)		
EDLBWRSC	**Stunting**	**No Stunting**	**Sig**	**OR**
Low risk	89 (27.6%)	164 (50.8%)	0.00	3.3
High risk	10 (3.1%)	60 (18.5%)		

Table 3 showed that, based on Dhiana Setyorini's Scorecard *(DSSC*) (detection of preeclampsia/preeclampsia risk), nearly half of the mothers had a low risk of stunting (44.9%). The incidence of stunting (ρ = 0.00) was associated with maternal risk factors on the *DSSC,* with an OR of 2.2. This finding indicates that infants born to high-risk mothers were 2.2 times more likely to experience stunting.

Table 3 also shows that, based on the early detection scorecard for LBW risk, most mothers with low risk did not have stunted infants (50.8%). Based on the *EDLBWRSC*, there is a significant association between maternal risk factors and stunting incidence (ρ = 0.00; OR = 3.3). This finding indicates that infants born to high-risk mothers were 3.3 times more likely to be stunted.

DISCUSSION

The DSSC results revealed the following maternal risk factors for stunting: obesity (BMI > 25) (ρ = 0.00; OR = 4.04), parity (ρ = 0.00; OR = 0.24), and a history of preeclampsia (ρ = 0.02; OR= 1.80). However, an income below the minimum wage (ρ = 0.52; OR = 0.64), maternal age (ρ = 0.07; OR = 0.60), history of high blood pressure (ρ = 0.23; OR = 1.73), history of preeclampsia (ρ = 0.47; OR = 0.59), and history of diabetes mellitus (ρ = 0.58; OR = 1.22) were not significant factors in the incidence of stunting in infants. The results of this study are inconsistent with Agustin & Rahmawati (2021), who found that 67.9% of families with stunted infants had incomes below the minimum wage. Another study also conducted a bivariate analysis using the Chi-square test to examine the relationship between family income and stunting incidence. The study obtained a p-value of 0.004 (OR = 0.178, CI 95% 0.52 to 0.607). This finding indicates a relationship between family income and stunting incidence (Agustin & Rahmawati, 2021).

Regarding parity, this study's findings are consistent with those of Marlenywati, Hariyadi, and Ichtiyati (2021), who found that stunting and parity are significantly correlated. Their analysis yielded an OR value of 8.067, indicating that mothers with parities greater than four are 8.067 times more likely to give birth to a stunted infant than mothers with parities less than four (Setiawati et al., 2022; Sheliha, 2020; Susanti et al., 2021). Parity is defined as the number of infants living in a home, which may affect their nutritional needs. If there are too many infants in the home or they are born too close together, this may increase the risk of stunting, making it difficult for the family to provide a balanced diet. In addition, mothers in early marriage and childbearing, combined with a lack of information and education, can increase the risk for their infants to become stunted. Infectious diseases that affect child growth and development are also contributing factors to stunting (Anatarias et al., 2024).

Next, Gabriela's 2024 study found no significant correlation between antenatal care history (ANC) and pregnancy-related comorbidities, or between ANC and the prevalence of stunting in infants aged 24 - 60 months in Tallu Banua village, contradicting this study's findings. The study found that hypertension during pregnancy was substantially correlated with a family history of hypertension (p = 0.013; OR = 4.958), with nearly five times higher risk. Additionally, another study found a significant correlation (p = 0.011; OR = 4.713) between a family history of preeclampsia and a nearly 4.7-fold increased risk for preeclampsia (Patriota et al., 2024). My results of research on a family history of pregnancy complications such as hypertension are not related to the incidence of stunting. This is because a family history of hypertension does not affect the incidence of stunting, as stunting is determined more by nutritional, infectious, and environmental factors rather than by genetic factors of degenerative diseases such as hypertension.

Furthermore, past studies have found a significant correlation (p = 0.033; OR = 4.156) between a family history of diabetes mellitus and stunting, suggesting that a family history of diabetes mellitus increases the risk of stunting by approximately four times. Past studies have found that fetuses do not obtain enough nutrients from mothers who are overweight and consume excess calories. Mothers with this condition are also intimately linked to a higher risk of inflammation, placental malfunction, and metabolic diseases. Additionally, insulin resistance and chronic inflammation can impair nutrient transfer from the mother to the fetus. This condition causes the fetus to be deficient in essential micronutrients, such as iron and zinc, which are important for fetal development (Nguyen et al., 2023; Pratiwi et al., 2025). My research shows that there is no correlation between a history of diabetes mellitus and stunting in toddlers. This is because stunting is directly influenced by nutritional and environmental factors, whereas diabetes mellitus is a metabolic disease whose genetic influence is not directly related to a child's height.

This nutrient deficiency may lead to an increased risk of preterm birth. Babies born prematurely with low birth weights

are at greater risk of long-term health problems, including stunting, as they did not have sufficient time to grow optimally in the womb. Preterm birth alters a child's future growth and development and increases the risk of neonatal morbidity (Patonah et al., 2021; Pratiwi et al., 2025). Next, this study found that maternal age is not significantly associated with stunting. This finding does not align with Pusmaika's (2022) finding, which showed a relationship between the mother's age during pregnancy and the incidence of stunting in the villages of Taban, Jambe, and Tigaraksa in Tangerang (p-value 0.035). Their study grouped participants' ages into risky (<20 years and >35 years) and non-risky/ideal age categories (20-35 years) (Pusmaika et al., 2022). Their study found that pregnancy is influenced by the mother's age, where women falling within the risky age category are at risk of experiencing pregnancy complications. The mother's age is not related to stunting because it is not a direct cause, and its influence is greatly affected by the care of toddlers, especially in terms of fulfilling their nutritional needs. Mothers who are too young (<20 years) or too old (>35 years) have a higher risk of pregnancy complications, but pregnancy risk is not a direct factor that can influence stunting because complications during pregnancy will not occur if the mother undergoes regular antenatal care.

In addition to maternal characteristics, maternal parenting practices toward infants can also influence the incidence of stunting in infants. The results of the 2024 Ummah study shows multivariate analysis using logistic regression on variables that demonstrate significant values from the bivariate analysis. The practice of feeding mothers to stunted toddlers illustrates that the factors affecting this practice, ranked from greatest to least impact, are as follows: economic factors (p=0.0001, OR=4.276), hygiene (p=0.13, OR=3.552), attitudes (p=0.0001, OR=3.237), culture (p=0.0001, OR=3.216), and knowledge (p=0.0004, OR=2.632). Among these, economic factors have the most substantial influence on the feeding practices, as indicated by an odds ratio (OR) of 4.276. This suggest that economic factors play a critical role in determining the feeding practices of mothers with stunted toddlers (Ummah, 2024).

shows the results of the bivariate analysis, which indicates that every independent variable has a significant correlation with stunting (p < 0.05), where the biggest OR is family income (OR =7.4). This suggests that families with economic levels under the regional minimum wage are 7.4 times more likely to have children suffering from stunting than those with an income level equal to or higher than the regional wage (Ezalia, Hasanah and Malfasari, 2022). Based on the Early Detection Scorecard for Low-Birth-Weight Risk (EDLBWRSC) results, the factors associated with stunting are anemia (ρ = 0.00) and a history of low birth weight (ρ = 0.00). These results align with those of Setiawati (2025), who found that most infants without a history of low birth weight do not suffer from stunting. This finding suggests that a history of LBW influences the incidence of stunting in infants with (ρ = 0.000; OR = 119.23). However, these results contradict Setiawati's 2024 study, which found that hemoglobin levels (0.605 > 0.05) have no partial impact on toddler stunting (Dewi et al., 2022; Setiawati et al., 2025).

Moreover, the cross-tabulation analysis of early detection risk factors on Dhiana Setyorini's scorecard (DSSC) with stunting incidence showed a significant association between early diagnosis of preeclampsia during pregnancy and stunting. The statistical test results showed a ρ value of 0.000 with OR = 2.2, indicating that the likelihood of stunting in infants born to high-risk mothers was twice as high. Their study's Fisher's exact test yielded a p-value of 0.013 < α of 0.05, allowing Ha to be accepted (Safutri, 2024; Stafford, 2023). Meanwhile, the cross-tabulation of early detection risk factors using the BBLR risk detection scorecard (EDLBWRSC) for stunting incidence showed a significant correlation (ρ = 0.000; OR = 3.3). This statistic indicates that mothers classified as high risk for low birth weight were 3.3 times more likely to have infants with stunting (Meikawati et al., 2021; Mulyasari et al., 2022).

CONCLUSION AND RECOMMENDATION

This study found that the following early detection risk factors on the Dhiana Setyorini scorecard (Early identification of preeclampsia risk and preeclampsia) are associated with stunting: parity, a family history of pregnancy toxicity, and obesity (BMI >25). Meanwhile, the EDLBWRSC revealed that the risk factors associated with stunting include anemia, hypertension or preeclampsia during pregnancy, and a history of LBW birth. Thus, the DSSC (early detection of preeclampsia/preeclampsia risk) and the EDLBWRSC can be used to identify maternal risk factors associated with stunting. Given this study's retrospective design, future research should consider a prospective or longitudinal design with a more diverse population to strengthen the association between maternal risk factors and stunting incidence. Nevertheless, this study highlighted the importance of using early screening tools to detect pregnancy complications, such as the Dhiana Setyorini Scorecard (DSSC) and the Early Detection of Low-Birth-Weight Risk Scorecard (EDLBWRSC), in antenatal care practice. Midwives, cadres, and pregnant women can use these tools to identify risk factors for stunting, thereby improving maternal and fetal health, reducing stunting risk, and supporting a healthy future generation.

REFERENCES

Adriani, P., Aisyah, I. S., Wirawan, S., Hasanah, L. N., Idris, Nursiah, A., Yulistianingsih, A., & Siswati, T. (2022). *Stunting pada anak* [Stunting in children]. PT Global Eksekutif Teknologi. https://www.researchgate.net/publication/364952626

Agustin, L., & Rahmawati, D. (2021). Hubungan pendapatan keluarga dengan kejadian stunting [The relationship between family income and stunting incidence]. *Indonesian Journal of Midwifery (IJM)*, *4*(1), 30–34. https://doi.org/10.35473/ijm.v4i1.715

Anatarias, S., Hipni, R., Rusmilawaty, & Kristiana, E. (2024). Hubungan Pengetahuan Gizi Ibu dan Paritas dengan Kejadian Stunting pada Balita di Wilayah Kerja Puskesmas Tanjung Tahun 2024. *IPSSJ: Integrative Perspective of Social and Science Journal*, *2*(1), 265–78.

Bangkalan, P. K. (2024). *Percepatan penurunan stunting (PPS) Kabupaten Bangkalan* [Accelerating stunting reduction (PPS) in Bangkalan Regency]. Pemerintah Kabupaten Bangkalan.

Dewi, A. P. S., Kusumastuti, K., & Astuti, D. P. (2022). Faktor-faktor yang mempengaruhi kejadian stunting pada anak balita [Factors influencing stunting incidence in toddlers]. *Jurnal Ilmu Keperawatan dan Kebidanan*, *13*(2), 549–555. https://doi.org/10.26751/jikk.v13i2.1340

Kurniati, R., Aisyah, S., Anggraini, H., & Wathan, F. M. (2022). Faktor-faktor yang mempengaruhi kejadian stunting pada balita usia 24–60 bulan [Factors influencing stunting incidence in toddlers aged 24–60 months]. *Aisyiyah Medika*, *7*, 11–23.

Meikawati, W., Rahayu, D. P. K., & Purwanti, I. A. (2021). Berat badan lahir rendah dan anemia ibu sebagai prediktor stunting pada anak usia 12–24 bulan di wilayah Puskesmas Genuk Kota Semarang [Low birth weight and maternal anemia as predictors of stunting in children aged 12–24 months in the working area of Puskesmas Genuk, Semarang]. *Media Gizi Mikro Indonesia*, *13*(1), 37–50. https://doi.org/10.22435/mgmi.v13i1.5207

Mulyasari, I., Jatiningrum, A., Setyani, A. P., & Kurnia, R. R. S. S. (2022). Faktor risiko stunting pada 1000 hari pertama kehidupan [Risk factors for stunting in the first 1000 days of life]. *Amerta Nutrition*, *6*(1SP), 177–183. https://doi.org/10.20473/amnt.v6i1sp.2022.177-183

Nguyen, H. Y., Park, B., Rossi, J., Tse, B., & Cryer, A. (2023). Impact of maternal obesity on preterm delivery in patients with cervical cerclage. *AJOG Global Reports*, *3*(2), Article 100211. https://doi.org/10.1016/j.xagr.2023.100211

Nikmah, N., Maduratna, E. S., Kamalia, A., & Puspita, D. (2020). Pencegahan stunting pada balita dan deteksi dini stunting di PAUD Anna Husada Bangkalan [Stunting prevention in toddlers and early detection of stunting at PAUD Anna Husada Bangkalan]. *Jurnal Paradigma*, *2*, 17–23.

Patonah, S., Afandi, A. A., & Resi, E. (2021). Hubungan indeks massa tubuh (IMT) dengan kejadian preeklampsia pada ibu hamil di Puskesmas Balen Kecamatan Balen Kabupaten Bojonegoro tahun 2020 [The relationship between body mass index (BMI) and preeclampsia incidence in pregnant women at Puskesmas Balen, Bojonegoro Regency in 2020]. *Asuhan Kesehatan*, *12*(1), 28. http://ejournal.rajekwesi.ac.id/index.php/jurnal-penelitian-kesehatan/article/view/297

Patriota, É. S. O., Abrantes, L. C. S., Figueiredo, A. C. M. G., Pizato, N., Buccini, G., & Gonçalves, V. S. S. (2024). Association between household food insecurity and stunting in infants aged 0−59 months: Systematic review and meta-analysis of cohort studies. *Maternal and Child Nutrition*, *20*(2), Article e13609. https://doi.org/10.1111/mcn.13609

Pratiwi, M. I. B., Ocviyanti, D., Wiradnyani, L. A. A., & Irwinda, R. (2025). Ancaman obesitas maternal terhadap kejadian stunting anak [Maternal obesity threats to childhood stunting incidence]. *Journal of the Indonesian Medical Association*, *74*(6), 274–278. https://doi.org/10.47830/jinma-vol.74.6-2024-1711

Primanto, A., & Puspitasari, L. (2024). Kebijakan penanggulangan penurunan angka stunting di Indonesia [Policy for tackling the reduction of stunting rates in Indonesia]. *Berajah Journal*, *4*(2), 393–408. https://doi.org/10.47353/bj.v4i2.332

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 [The relationship between maternal age during pregnancy and stunting incidence in toddlers in Tangerang Regency]. *Indonesian Health Issue*, *1*(1), 49–56. https://doi.org/10.47134/inhis.v1i1.11

Safutri, M. (2024). Meta-analysis: Faktor risiko maternal terhadap kejadian stunting pada balita di Indonesia [Meta-analysis: Maternal risk factors for stunting incidence in toddlers in Indonesia]. *Jurnal Ilmu Kesehatan Masyarakat*, *13*(01), 50–65. https://doi.org/10.33221/jikm.v13i01.2443

Setiawati, I., Daniati, D., & Nurul, S. (2025). Analisis faktor yang mempengaruhi kejadian stunting pada balita [Analysis of factors influencing stunting incidence in toddlers]. *Faletehan Health Journal*, *12*(2), 213–218. https://doi.org/10.37010/mnhj.v3i2.750

Setiawati, I., & Maulana, T. (2024). Pengaruh kadar hemoglobin dan lingkar lengan atas ibu hamil terhadap kejadian stunting pada balita [The effect of hemoglobin levels and upper arm circumference of pregnant women on stunting incidence in toddlers]. *Media Ilmu Kesehatan*, *13*(2), 199–205. https://doi.org/10.30989/mik.v13i2.1048

Setiawati, I., Qomari, S. N., & Daniati, D. (2022). Hubungan paritas, usia kehamilan dan pekerjaan ibu hamil dengan tingkat kecemasan ibu hamil di Puskesmas Trageh [The relationship between parity, gestational age and occupation of pregnant women with anxiety levels at Puskesmas Trageh]. *Jurnal Ilmiah Ilmu Kebidanan dan Kandungan*, 154–160. https://stikes-nhm.e-journal.id/JOB/article/download/792/788

Setyorini, D., & Cahyono, D. I. (2022). *Modul deteksi dini resiko preeklamsia* [Module for early detection of preeclampsia risk]. PT Mahakarya Cipta Utama Grup.

Setyorini, D., Santoso, B., Martini, S., & Ernawati, I. C. (2019). Early detection score of preeclampsia risk. Indian Journal of Forensic Medicine and Toxicology, 13(4), 171. https://doi.org/10.37506/ijfmt.v13i4.1518.

Sheliha, N. L. (2020). Literature review: Faktor-faktor yang mempengaruhi kejadian persalinan [Literature review: Factors influencing childbirth incidence]. *Jurnal Skripsi*, *15*(1).

Stafford, K. (2023). What's at stake. In *The art of revising poetry: 21 U.S. poets on their drafts, craft, and process* (pp. 119–123). Bloomsbury Academic. https://doi.org/10.5040/9781350289291.ch-017

Susanti, Sohimah, & Rosdiana, R. (2021). Hubungan usia, paritas, dan pendidikan dengan tingkat pengetahuan ibu hamil trimester III tentang alat kontrasepsi IUD dan implan pasca persalinan di Puskesmas Cilacap Selatan 1 tahun 2019 [The relationship between age, parity, and education with third trimester pregnant women's knowledge of IUD and implant contraception at Puskesmas Cilacap Selatan 1 in 2019]. *Jurnal Kesehatan Bidkesmas Respati*, *2*(12), 20–26. http://ejurnal.stikesrespati-tsm.ac.id/index.php/bidkes/article/view/403

Tahangnacca, M., Amiruddin, R., Ansariadi, & Syam, A. (2020). Model of stunting determinants: A systematic review. *Enfermería Clínica*, *30*, 241–245. https://doi.org/10.1016/j.enfcli.2019.10.076

Ummah, A. K. (2024). The determinant mother feeding on children under five stunting health center in rural area. *Jurnal Keperawatan Soedirman*, *19*(3), 165–170. https://doi.org/10.20884/1.jks.2024.19.3.8802.

UNICEF, WHO, & World Bank Group. (2023). *Levels and trends in child malnutrition: Key findings of the 2023 edition*. UNICEF/WHO/World Bank Group.