SIKLUS: Journal Research Midwifery Politeknik Tegal
Volume 15, Issue 01, January 2026

p-ISSN: 2089-6778
e-ISSN: 2549-5054

MATERNAL RISK FACTORS ASSOCIATED WITH STUNTING AMONG UNDER-FIVE CHILDREN IN SOUTHEAST ASIA: A LITERATURE REVIEW

Anita Dewi Anggraini[1], Diyas Windarena[2], Dwi Ardani Rochmaniah[3], Ika Ayu Purnamasari[4]

Email: anitadewi044@gmail.com[1], diyaswinda@gmail.com[2], dwiardani.rochmaniah@gmail.com[3], ikaumikafi145@gmail.com[4]

[1]Midwifery Professional Education Program, Bhakti Husada Mulia, Madiun, Indonesia

[2,3,4]Bachelor of Midwifery Program, Bhakti Husada Mulia, Madiun, Indonesia

Article Information

Received:
May 12, 2025

Revised:
November 12, 2025

Accepted:
December 12, 2025

Abstract

Stunting remains a major global health challenge, with a worldwide prevalence of 21.9% among children under five. The Southeast Asian region contributes more than one-quarter of all stunting cases globally. This condition affects not only the growth and development of children but also increases morbidity and mortality rates, which in turn influence national productivity and economic outcomes in the future. Maternal risk factors play a critical role, contributing more than 50% to a child's growth. This study aims to identify maternal risk factors associated with stunting in Southeast Asia. Data were retrieved from PubMed, Springer, and ProQuest using the keywords "children," "stunting," "maternal risk factors," and "Southeast Asia." Of the 768 articles identified, only 10 met the inclusion criteria. Most studies were conducted in Indonesia, followed by the Philippines, Myanmar, Cambodia, and Vietnam. Maternal factors associated with stunting include infections during pregnancy, nutritional status, maternal height, educational level, hygiene practices, supplement intake during pregnancy, maternal age, employment status, MUAC, dietary diversity during pregnancy, and maternal stress.

Keyword: *Children under 5 years old, Maternal, Risk factors, Southeast Asia, Stunting*

Correspondence:
Anita Dewi Anggraini. Midwifery Professional Education Program, Universitas Bhakti Hasta Mulia, Madiun, Indonesia. Jl. Taman Praja No. 25, Madiun.
anitadewi044@gmail.com

1. Introduction

Stunting is a form of malnutrition that remains a major global public health problem. It results from chronic undernutrition beginning in early life, leading to impaired linear growth [1]. Stunting is defined as a height-for-age z-score of less than minus two standard deviations based on the WHO growth standards. According to UNICEF, the global prevalence of stunting among under-five children reached 21.9%, affecting approximately 149.2 million children in 2020. Africa and Asia account for the highest number of stunting cases compared with other regions. Within Asia, South Asia has the highest prevalence at 30.7%, followed by Southeast Asia at 27.4%. Although the estimated number of under-five children affected by stunting has declined, the rate of reduction remains relatively slow, at approximately 1.5% per year [2].

Within this global context, Southeast Asia represents one of the regions with a particularly high burden of

p-ISSN: 2089-6778
e-ISSN: 2549-5054

stunting. Southeast Asia is a region located in the southeastern part of the Asian continent and is characterized by diversity in economic conditions, cultural backgrounds, social structures, geographic features, and demographic profiles. In addition to this diversity, countries in the region differ considerably in their accessibility to education, healthcare services, and sanitation. Despite these variations, most Southeast Asian countries are classified as developing nations, with Singapore being the only exception. This situation contributes to persistent poverty and economic inequality across many countries in the region. Limited access to nutritious food and adequate healthcare services further increases the risk of stunting among under-five children. Southeast Asia consists of eleven countries, seven of which report stunting prevalence above the global average. The highest prevalence is observed in Timor-Leste (48.8%), followed by Indonesia (31.8%), Laos (30.2%), Cambodia (29.9%), the Philippines (28.7%), Myanmar (25.2%), and Vietnam (22.3%). According to data released by the World Health Organization, Southeast Asia accounts for more than one-quarter of children affected by stunting worldwide [3].

In addition to its high prevalence, stunting is associated with serious short- and long-term consequences. If left unaddressed, stunting can lead to increased morbidity and mortality, adverse effects on child development, poorer health outcomes in adulthood, and cognitive impairment [4]. Stunting also contributes to increased healthcare costs, as children who experience stunting are at a higher risk of developing non-communicable diseases later in life [3]. Furthermore, stunting is associated with reduced work productivity, resulting in income losses of up to 20%, increased vulnerability to poverty by as much as 33%, and an estimated annual loss of 11% of gross national product (GNP) in Asia and Africa [5].

To address these consequences, it is essential to understand the underlying causes of stunting. Stunting is caused by multiple factors, both direct and indirect. It may originate from malnutrition during the prenatal period and the early days after birth; however, its effects often become evident only when a child reaches two years of age (Ministry of Health of the Republic of Indonesia, 2018). Among the various determinants of stunting, maternal risk factors play a particularly critical role. Maternal conditions contribute to more than 50% of child growth outcomes [6]. Sartika et al. (2021) reported that the majority of stunting cases among under-five children are closely associated with preconception and pregnancy-related conditions [9]. Evidence indicates that women who do not consume nutritional supplements such as vitamins, iron, and folic acid during pregnancy have a 1.67-fold higher likelihood of having children who are stunted or underweight. Supplement consumption during the first six months of pregnancy has been shown to significantly reduce the risk of stunting by 14% compared with women who do not consume supplements [7]. Other studies have reported that maternal nutritional status prior to conception influences fetal linear growth and the risk of stunting during the first 1,000 days of life. Maternal body mass index (BMI) has been significantly associated with a 1.3-fold increased risk of stunting in children [8].

Despite growing recognition of the importance of maternal factors, evidence specific to Southeast Asia remains limited and fragmented. While maternal determinants of stunting have been widely acknowledged at the global level, there is still a lack of systematic literature reviews that specifically screen, identify, and map significant maternal risk factors associated with stunting among under-five children in the Southeast Asian region. Therefore, a focused review is needed to examine maternal factors contributing to stunting in Southeast Asia and to provide a clearer

p-ISSN: 2089-6778
e-ISSN: 2549-5054

evidence base for targeted prevention and intervention strategies.

2. Method

This study employed a Systematic Literature Review (SLR) method. The population of this review comprised children under five years of age in Southeast Asian countries. The literature review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

The article search process was carried out using three electronic databases: PubMed, Springer, and ProQuest. Data were collected from studies published between 2015 and 2025 using predefined keywords. The keywords applied across all databases were "children," "stunting," "maternal risk factors," and "Southeast Asia" [9]. All retrieved articles were imported into Mendeley, where duplicate records were identified and removed.

Article selection involved an independent quality assessment using the Joanna Briggs Institute (JBI) Critical Appraisal Tools (2017). The inclusion criteria were as follows: (1) studies involving children under five years of age; (2) studies examining maternal risk factors associated with stunting; (3) studies conducted in countries within the Southeast Asian region; (4) studies of all research designs; (5) articles published between 2015 and 2025 and indexed in the three selected databases; (6) articles published in English; (7) original research articles, including randomized controlled trials (RCTs), cross-sectional studies, and case–control studies; and (8) freely accessible articles published in the fields of medicine and public health.

This study was conducted with contributions from all authors according to their respective roles. The article selection process was performed in several stages. The first stage involved identifying and removing duplicate articles using Mendeley. The second stage consisted of an independent review of article titles and abstracts by two reviewers based on the agreed inclusion criteria. The third stage involved assessing the quality of full-text articles independently by two reviewers using the JBI Critical Appraisal Tools Checklist, with assessment criteria tailored to the specific study design of each article. The fourth stage involved data extraction in accordance with the predefined research objectives.

3. Results and Discussion

The literature search was conducted between 1 and 30 April 2025 and identified a total of 768 records from the three selected databases. After the removal of duplicate articles, 713 records remained for title and abstract screening. Following the exclusion of studies that did not meet the eligibility criteria, 53 articles were retrieved for full-text assessment. Of these, 10 studies fulfilled the inclusion criteria and were subsequently included in the final analysis. Quality appraisal was performed using the Joanna Briggs Institute (JBI) Critical Appraisal Tools (2017). Based on this assessment, all studies included in the synthesis were classified as having good methodological quality. Overall, the database search yielded 768 articles, and after screening titles, abstracts, full texts, and removing duplicates, 10 studies were retained for inclusion. The complete selection process is illustrated in the PRISMA flow diagram (Figure 1).

p-ISSN: 2089-6778
e-ISSN: 2549-5054

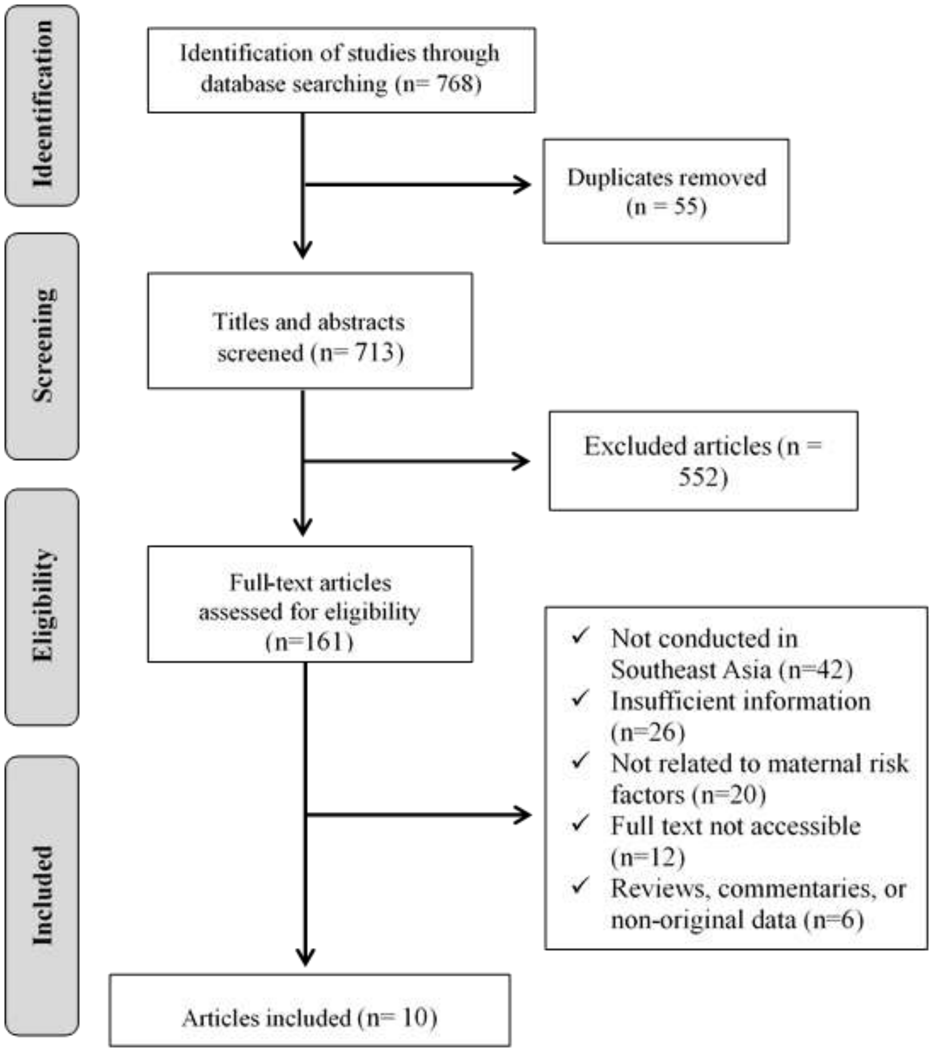

Figure 1. PRISMA flow diagram

The included studies were published between 2019 and 2024. As summarized in Table 1, sample sizes ranged from 212 to 86,293 participants. Regarding study design, five studies employed a cross-sectional approach, four used a case–control design, and one was a cohort study. Most of the studies were conducted in Indonesia, while the remaining studies were carried out in the Philippines, Myanmar, Cambodia, and Vietnam. Across the ten included studies, a range of maternal risk factors associated with childhood stunting were identified. These factors included maternal infection during pregnancy, maternal nutritional status, maternal height, maternal education level, maternal hygiene practices, supplementation during pregnancy, maternal age (<20 years or >35 years), maternal employment status, mid-upper arm circumference (MUAC) < 23.5 cm, maternal body mass index (BMI), dietary diversity during pregnancy, maternal stress, hyperemesis gravidarum, and adequacy of antenatal care (ANC) visits.

Table 1. Data Extraction of Included Studies

No	Author	Country	Study Design	Sample Size	Significant Associations (p < 0.05)
1	Maulina et al [10]	Indonesia	Case control	450	Infections during pregnancy: sexually transmitted infections (STIs), tuberculosis, hepatitis B, HIV/AIDS, COVID-19; hypertension; preeclampsia.
2	Beal et al [17]	Vietnam	Cross sectional	86.293	Maternal height < 145 cm; maternal education; maternal hygiene practices; supplementation during pregnancy.
3	Novianti et al [18]	Indonesia	Case control	212	Maternal hygiene practices
4	Sahiddin et al [15]	Indonesia	Case control	681	Malaria exposure during pregnancy; maternal age (<20 years or >35 years); maternal employment status.
5	Kpewou et al [19]	Cambodia	Cohort	779	Mid-upper arm circumference (MUAC) < 23.5 cm; maternal dietary diversity during pregnancy.
6	Susiloretni et al [20]	Indonesia	Cross sectional	46.315	Maternal stress; presence of infectious disease; MUAC < 23.5 cm; maternal height < 150 cm; maternal distress; maternal education; maternal employment
7	Santosa et al [21]	Indonesia	Case control	264	Birth spacing; maternal nutritional status during pregnancy; infectious diseases during pregnancy; nutritional intake during pregnancy (milk, vitamins, folic acid); anemia during pregnancy; MUAC < 23.5 cm; hyperemesis gravidarum.
8	Ulep et al [6]	Philippines	Cross sectional	1881	Maternal education; maternal age at delivery; maternal height < 145 cm; maternal nutritional status.
9	Blankenship et al [22]	Myanmar	Cross sectional	4.550	Maternal height < 145 cm; maternal nutritional status; maternal employment.
10	Kusumajaya et al [23]	Indonesia	Cross sectional	768	Maternal education level; antenatal care (ANC) visits; iron tablet consumption.

Maternal Infections During Pregnancy

This review indicates that maternal infections during pregnancy constitute an important risk factor for childhood stunting [10]. Intrauterine infections caused by bacteria, viruses, and parasites may adversely affect fetal development, leading to preterm birth, intrauterine growth restriction (IUGR), low birth weight, and congenital abnormalities. Infants born prematurely due to intrauterine bacterial infections often experience severe morbidity and long-term consequences, including chronic lung disease, asthma, cerebral palsy, and neurodevelopmental disorders [11]. Among maternal complications, sexually transmitted infections (STIs) represent the most dominant risk factor associated with stunting. Pregnant women with STIs have a sixfold higher risk of delivering stunted infants [10]. Maternal infections linked to stunting include COVID-19 with pneumonia, tuberculosis, HIV/AIDS, hepatitis B, and other infectious conditions. Prolonged exposure to infection during pregnancy affects fetal weight gain and subsequently impairs linear growth [12,13]. Importantly, maternal infections can be prevented through early detection during integrated antenatal care (ANC). Recommended laboratory examinations during pregnancy include sputum smear microscopy, HBsAg testing, TPHA/RPR for STIs, HIV testing, swab or PCR tests, blood pressure measurement, blood

 p-ISSN: 2089-6778
e-ISSN: 2549-5054

glucose levels, urinary protein assessment, and electrocardiography [14].

In the context of region-specific infectious diseases, children born to mothers who experienced malaria during pregnancy are also at increased risk of stunting [15]. This condition occurs because erythrocytes infected with Plasmodium falciparum accumulate in the placental vascular space and adhere to endothelial cells, facilitating parasite sequestration and replication. Parasitic infection within the placental blood and the resulting cellular immune response require substantial nutritional resources, thereby reducing the availability of glucose and oxygen for fetal transfer [16]. This mechanism negatively affects fetal growth and development [24]. However, other studies have reported no significant differences in weight or height gain between children exposed to malaria and those unexposed in rural Gambia [25].

Maternal Nutritional Status and Dietary Intake

Maternal nutritional status during adolescence or the preconception period, pregnancy, and the postpartum phase plays a critical role in determining fetal linear growth [20–22]. Maternal undernutrition increases the risk of low birth weight, preterm birth, small-for-gestational-age infants, and reduced nutrient reserves transferred to the infant at birth and during breastfeeding. These conditions contribute to a higher risk of malnutrition later in childhood [26]. Furthermore, dietary diversity during pregnancy has been shown to be an important determinant of fetal linear growth, as demonstrated in studies conducted in Cambodia [20]. Many women of reproductive age consume diets dominated by rice, vegetables, and small amounts of fish, and these dietary patterns often remain unchanged during pregnancy, resulting in suboptimal nutrient intake for fetal growth. Other studies have reported that adequate nutritional intake during pregnancy, particularly through the consumption of milk and dairy products, is associated with optimal fetal growth and adequate birth weight compared to mothers with low milk intake [27].

Micronutrient Supplementation During Pregnancy

Women who do not consume additional supplements during pregnancy have a 1.67-fold higher likelihood of having children with stunting and underweight. Pregnancy supplements commonly include iron, folic acid, and other essential vitamins [17]. According to Stephen et al., iron–folic acid supplementation during the first six months of pregnancy significantly reduces the risk of stunting by 14% compared with women who do not receive supplementation [28].

Maternal Anthropometric Characteristics

Closely related to nutritional adequacy, maternal anthropometric status provides an objective indicator of long-term nutritional conditions. Low maternal body mass index (BMI <17.5–18.0 kg/m²) is significantly associated with a 1.3-fold increased risk of childhood stunting [6,29]. Similarly, maternal malnutrition assessed using mid-upper arm circumference (MUAC) has been shown to correlate with the severity of child malnutrition ($p < 0.05$) [30]. Therefore, routine MUAC monitoring during pregnancy may serve as a simple and practical proxy for identifying infants at risk of growth faltering and stunting [31].

Maternal Mental Health and Psychosocial Factors

Maternal mental health emerges as an important yet often overlooked determinant of child growth. This review found that maternal depressive symptoms were associated with more than a twofold increased risk of reduced height-for-age among children [20]. Maternal stress and depression may disrupt the hypothalamic–pituitary–adrenal (HPA) axis, leading to physiological effects during intrauterine growth [32]. Elevated prenatal cortisol and norepinephrine levels may impair fetal growth.

p-ISSN: 2089-6778
e-ISSN: 2549-5054

Moreover, psychological distress may indirectly affect child growth through suboptimal caregiving and feeding practices. Mothers experiencing depression often suffer from fatigue, impaired concentration, and psychomotor retardation, which can compromise responsive feeding and childcare [33]. In line with these findings, Surkan et al. reported that children of mothers with mild to moderate depression were, on average, 0.26 cm shorter than their peers [34].

Maternal Hygiene Practices

From a behavioral perspective, maternal hygiene practices also play a significant role in childhood stunting. Poor hygiene behaviors increase the likelihood of stunting by 1.9 times [17,18]. primarily due to repeated exposure to pathogenic bacteria through contaminated food and unhygienic environments. Failure to wash hands before eating, after using the toilet, and after contact with fecal matter are key predictors of stunting in young children. Given that mothers are typically the primary caregivers, maintaining good maternal hygiene is a fundamental component of effective child care [35]. Accordingly, strengthening hygiene promotion particularly handwashing with soap at critical times remains an essential preventive strategy.

Maternal Socio-Demographic Characteristics

Maternal socio-demographic characteristics also play a critical role in shaping child growth outcomes. Maternal height has been identified as a strong intergenerational determinant of child linear growth [6,17,20,22], accounting for up to 26% of stunting risk. Short maternal stature is associated with limited energy reserves and smaller reproductive organ size, which may restrict fetal growth and increase the likelihood of low birth weight [6]. Furthermore, short stature is often linked to lower socioeconomic status, which can constrain access to adequate nutrition and healthcare, thereby perpetuating growth failure [36].

Similarly, maternal age may influence stunting indirectly through biological and social pathways [21]. Adolescent mothers often face nutritional competition with the developing fetus and may lack psychological readiness for breastfeeding and childcare. Early pregnancy is also frequently accompanied by psychosocial stressors, including school discontinuation and limited social support, which may further compromise child growth outcomes.

The findings also indicate that maternal education is associated with an increased risk of stunting [6,17,20]. Mothers with higher educational attainment generally possess better knowledge of optimal feeding and caregiving practices, greater access to health-related information, increased self-confidence in interacting with healthcare providers, and improved employment opportunities and income, which facilitate access to healthcare and nutritional services for their children.

According to Santosa et al. [21] unintended pregnancy was not significantly associated with childhood stunting. However, this finding may reflect the tendency for unintended pregnancies to be neglected, either consciously or unconsciously. Such neglect may manifest as inappropriate feeding practices, poor mother–child bonding, and inadequate utilization of healthcare services. In contrast, previous studies have reported that 24–40% of children born from unintended pregnancies experience stunting [37].

4. Conclusion

Maternal risk factors play a critical role in shaping the risk of stunting among children under five in Southeast Asia. This review highlights maternal nutritional status (including mid–upper arm circumference and maternal height), infections during pregnancy, hygiene practices, and maternal education as key determinants of stunting across the region. These findings suggest that effective stunting prevention should place greater emphasis on improving maternal nutrition, strengthening early detection and management of infections, and expanding maternal health education starting from the preconception period.

5. Acknowledgement

The authors gratefully acknowledge all individuals and institutions who contributed to the research process and the completion of this manuscript. It is hoped that this work will offer valuable insights for the advancement of knowledge and practice in related fields.

6. References

[1] Vaivada T, Akseer N, Akseer S, Somaskandan A, Stefopulos M, Bhutta Za. Stunting In Childhood: An Overview Of Global Burden, Trends, Determinants, And Drivers Of Decline. American Journal Of Clinical Nutrition 2020;112:777s-791s. Https://Doi.Org/10.1093/Ajcn/Nqaa159.

[2] Unicef. Joint Child Malnutrition Estimates (Jme) 2021. Https://Data.Unicef.Org/Resources/Jme-Report-2023/ (Accessed May 3, 2025).

[3] Unicef. Joint Child Malnutrition Estimates (Jme). Unicef 2023. Https://Data.Unicef.Org/Resources/Jme-Report-2023/ (Accessed May 3, 2025).

[4] Vaivada T, Akseer N, Akseer S, Somaskandan A, Stefopulos M, Bhutta Za. Stunting In Childhood: An Overview Of Global Burden, Trends, Determinants, And Drivers Of Decline. Am J Clin Nutr 2020;112:777s. Https://Doi.Org/10.1093/Ajcn/Nqaa159.

[5] Suryana Ea, Azis M. The Potential Of Economic Loss Due To Stunting In Indonesia. Jurnal Ekonomi Kesehatan Indonesia 2023;8:6. Https://Doi.Org/10.7454/Eki.V8i1.6796.

[6] Ulep Vgt, Uy J, Casas Ld. What Explains The Large Disparity In Child Stunting In The Philippines? A Decomposition Analysis. Public Health Nutr 2021;25:2995. Https://Doi.Org/10.1017/S136898002100416x.

[7] Stephen G, Mgongo M, Hussein Hashim T, Katanga J, Stray-Pedersen B, Msuya Se. Anaemia In Pregnancy: Prevalence, Risk Factors, And Adverse Perinatal Outcomes In Northern Tanzania. Anemia 2018;2018. Https://Doi.Org/10.1155/2018/1846280.

[8] Young Mf, Nguyen Ph, Casanova Ig, Addo Oy, Tran Lm, Nguyen S, Et Al. Role Of Maternal Preconception Nutrition On Offspring Growth And Risk Of Stunting Across The First 1000 Days In Vietnam: A Prospective Cohort Study. Plos One 2018;13. Https://Doi.Org/10.1371/Journal.Pone.0203201.

[9] Sartika An, Khoirunnisa M, Meiyetriani E, Ermayani E, Pramesthi Il, Nur Ananda Aj. Prenatal And Postnatal Determinants Of Stunting At Age 0–11 Months: A Cross-Sectional Study In Indonesia. Plos One 2021;16:E0254662. Https://Doi.Org/10.1371/Journal.Pone.0254662.

[10] Maulina R, Qomaruddin Mb, Prasetyo B, Indawati R. Maternal Complications During Pregnancy And Risk Factors For Stunting. Iran J Nurs Midwifery Res 2024;29:309. Https://Doi.Org/10.4103/Ijnmr.Ijnmr_358_22.

[11] Adams Waldorf Km, Mcadams Rm. Influence Of Infection During Pregnancy On Fetal Development. Reproduction 2013;146. Https://Doi.Org/10.1530/Rep-13-0232.

[12] Kondracki Aj, Li W, Bursac Z, Mokhtari M, Reddick B, Barkin Jl. Interaction Effects Of Maternal

 p-ISSN: 2089-6778
e-ISSN: 2549-5054

Sexually Transmitted Infections With Prenatal Care Utilization Status On Preterm Birth And Low Birthweight: U.S. National Data. J Clin Med 2022;11. Https://Doi.Org/10.3390/Jcm11175184.

[13] Villar J, Ariff S, Gunier Rb, Thiruvengadam R, Rauch S, Kholin A, Et Al. Maternal And Neonatal Morbidity And Mortality Among Pregnant Women With And Without Covid-19 Infection: The Intercovid Multinational Cohort Study. Jama Pediatr 2021;175:817–26. Https://Doi.Org/10.1001/Jamapediatrics.2021.1050.

[14] Howell Ea. Reducing Disparities In Severe Maternal Morbidity And Mortality. Clin Obstet Gynecol 2018;61:387–99. Https://Doi.Org/10.1097/Grf.0000000000000349.

[15] Sahiddin M, Ishak H, Arsin Aa, Pramestiyani M. Impact Of Early-Life Malaria Exposure On Childhood Stunting: A Case-Control Study In High Endemic Malaria Area, Papua, Indonesia. Narra J 2024;4:E1451. Https://Doi.Org/10.52225/Narra.V4i3.1451.

[16] Steketee Rw. Pregnancy, Nutrition And Parasitic Diseases. J Nutr 2003;133:1661s-1667s. Https://Doi.Org/10.1093/Jn/133.5.1661s.

[17] Beal T, Le Dt, Trinh Th, Burra Dd, Huynh T, Duong Tt, Et Al. Child Stunting Is Associated With Child, Maternal, And Environmental Factors In Vietnam. Matern Child Nutr 2019;15:E12826. Https://Doi.Org/10.1111/Mcn.12826.

[18] Novianti S, Huriyati E, Padmawati Rs. Safe Drinking Water, Sanitation And Mother's Hygiene Practice As Stunting Risk Factors: A Case Control Study In A Rural Area Of Ciawi Sub-District, Tasikmalaya District, West Java, Indonesia. Ethiop J Health Sci 2023;33:935. Https://Doi.Org/10.4314/Ejhs.V33i6.3.

[19] Kpewou De, Poirot E, Berger J, Som Sv, Laillou A, Belayneh Sn, Et Al. Maternal Mid-Upper Arm Circumference During Pregnancy And Linear Growth Among Cambodian Infants During The First Months Of Life. Matern Child Nutr 2020;16:E12951. Https://Doi.Org/10.1111/Mcn.12951.

[20] Susiloretni Ka, Smith Er, Suparmi, Marsum, Agustina R, Shankar Ah. The Psychological Distress Of Parents Is Associated With Reduced Linear Growth Of Children: Evidence From A Nationwide Population Survey. Plos One 2021;16:E0246725. Https://Doi.Org/10.1371/Journal.Pone.0246725.

[21] Santosa A, Arif En, Ghoni Da. Effect Of Maternal And Child Factors On Stunting: Partial Least Squares Structural Equation Modeling. Clin Exp Pediatr 2021;65:90. Https://Doi.Org/10.3345/Cep.2021.00094.

[22] Blankenship Jl, Cashin J, Nguyen Tt, Ip H. Childhood Stunting And Wasting In Myanmar: Key Drivers And Implications For Policies And Programmes. Matern Child Nutr 2020;16:E12710. Https://Doi.Org/10.1111/Mcn.12710.

[23] Kusumajaya Aan, Mubasyiroh R, Sudikno S, Nainggolan O, Nursanyoto H, Sutiari Nk, Et Al. Sociodemographic And Healthcare Factors Associated With Stunting In Children Aged 6–59 Months In The Urban Area Of Bali Province, Indonesia 2018. Nutrients 2023;15. Https://Doi.Org/10.3390/Nu15020389.

[24] Kang H, Kreuels B, Adjei O, Krumkamp R, May J, Small Ds. The Causal Effect Of Malaria On

p-ISSN: 2089-6778
e-ISSN: 2549-5054

Stunting: A Mendelian Randomization And Matching Approach. Int J Epidemiol 2013;42:1390–8. Https://Doi.Org/10.1093/Ije/Dyt116.

[25] Wilson Al, Bradley J, Kandeh B, Salami K, D'alessandro U, Pinder M, Et Al. Is Chronic Malnutrition Associated With An Increase In Malaria Incidence? A Cohort Study In Children Aged Under 5 Years In Rural Gambia. Parasit Vectors 2018;11. Https://Doi.Org/10.1186/S13071-018-3026-Y.

[26] Black Re, Victora Cg, Walker Sp, Bhutta Za, Christian P, De Onis M, Et Al. Maternal And Child Undernutrition And Overweight In Low-Income And Middle-Income Countries. The Lancet 2013;382:427–51. Https://Doi.Org/10.1016/S0140-6736(13)60937-X.

[27] Lise Brantsæter A, Olafsdottir Annas, Forsum E, Olsen Sjurdurf, Thorsdottir I. Does Milk And Dairy Consumption During Pregnancy Influence Fetal Growth And Infant Birthweight? A Systematic Literature Review. Food Nutr Res 2012;56:20050. Https://Doi.Org/10.3402/Fnr.V56i0.20050.

[28] Stephen G, Mgongo M, Hussein Hashim T, Katanga J, Stray-Pedersen B, Msuya Se. Anaemia In Pregnancy: Prevalence, Risk Factors, And Adverse Perinatal Outcomes In Northern Tanzania. Anemia 2018;2018. Https://Doi.Org/10.1155/2018/1846280.

[29] Young Mf, Nguyen Ph, Casanova Ig, Addo Oy, Tran Lm, Nguyen S, Et Al. Role Of Maternal Preconception Nutrition On Offspring Growth And Risk Of Stunting Across The First 1000 Days In Vietnam: A Prospective Cohort Study. Plos One 2018;13. Https://Doi.Org/10.1371/Journal.Pone.0203201.

[30] Bari A, Sultana N, Mehreen S, Sadaqat N, Imran I, Javed R. Patterns Of Maternal Nutritional Status Based On Mid Upper Arm Circumference. Pak J Med Sci 2020;36. Https://Doi.Org/10.12669/Pjms.36.3.1331.

[31] Kpewou De, Poirot E, Berger J, Som Sv, Laillou A, Belayneh Sn, Et Al. Maternal Mid-Upper Arm Circumference During Pregnancy And Linear Growth Among Cambodian Infants During The First Months Of Life. Matern Child Nutr 2020;16:E12951. Https://Doi.Org/10.1111/Mcn.12951.

[32] Fung Tc, Olson Ca, Hsiao Ey. Interactions Between The Microbiota, Immune And Nervous Systems In Health And Disease. Nat Neurosci 2017;20:145–55. Https://Doi.Org/10.1038/Nn.4476

[33] Field T, Diego M, Hernandez-Reif M. Prenatal Depression Effects On The Fetus And Newborn: A Review. Infant Behav Dev 2006;29:445–55. Https://Doi.Org/10.1016/J.Infbeh.2006.03.003.

[34] Surkan Pj, Ettinger Ak, Hock Rs, Ahmed S, Strobino Dm, Minkovitz Cs. Early Maternal Depressive Symptoms And Child Growth Trajectories: A Longitudinal Analysis Of A Nationally Representative Us Birth Cohort. Bmc Pediatr 2014;14. Https://Doi.Org/10.1186/1471-2431-14-185.

[35] Woldesenbet B, Tolcha A, Tsegaye B. Water, Hygiene And Sanitation Practices Are Associated With Stunting Among Children Of Age 24-59 Months In Lemo District, South Ethiopia, In 2021: Community Based Cross Sectional Study. Bmc Nutr 2023;9. Https://Doi.Org/10.1186/S40795-023-00677-1.

[36] Aryastami Nk, Shankar N, Kusumawardani B, Besral Ab, Jahari Ae, Achadi E. Low Birth Weight Was The Most Dominant Predictor Associated With Stunting Among Children Aged 12 2017.

[37] Baschieri A, Machiyama K, Floyd S, Dube A, Molesworth A, Chihana M, Et Al. Unintended Childbearing And Child Growth In Northern Malawi. Matern Child Health J 2017;21:467–74. Https://Doi.Org/10.1007/S10995-016-2124-8.