Maternal Factors as Determinants of Stunting in Children under the Age of Five: Scoping Review

Anna Uswatun Qoyimah✉[1)], Zahroh Shaluhiyah[1)], Sri Winarni[2)]

[1] Health Promotion, Faculty of Public Health, Diponegoro University, Semarang, Central Java, Indonesia
[2] Biostatistics and Demography, Faculty of Public Health, Diponegoro University, Semarang, Central Java, Indonesia
✉Email: annauswatun151@gmail.com

ABSTRACT

***Background**: Chronic malnutrition during a child's early years leads to stunting, a condition that can harm both their mental and physical development. Studies have indicated a correlation between parenting styles and stunted growth in children that the nutritional knowledge and practices of mothers significantly affect the dietary habits of toddlers. The perspectives and cultural convictions of mothers are significant but have received limited attention as factors that influence the nutritional well-being of children and adolescents. **Aims**: This review examined maternal factors as determinants of stunting in children under five. **Methods**: Three databases were used to search for literature, namely PubMed, Scopus, and Google Scholar. The key to the search is as follows: "maternal" or "mothers" and "factor" and "stunting" or "stunted" or "growth disorder" and "toddler" or "children under five." The material displayed in search engines is selected based on inclusion and exclusion criteria. **Result**: This review was done on nine articles that were screened and analyzed out of 1,450 articles. The articles come from Nepal, India, Indonesia, Ghana, Congo, Uganda, Lebanon, and the Central African Republic. The type of research articles was cross-sectional and case-control. **Conclusion**: This review has provided an overview of maternal factors contributing to the prevalence of stunting. These factors include maternal employment, the educational status of mothers, maternal body mass index, the diversity of the mother-child diet, maternal exposure to mass media, and maternal age.*

***Keywords**: Children under five, maternal factors, scoping review, stunting*

INTRODUCTION

Chronic malnutrition during a child's early years leads to stunting, a condition that can harm both their mental and physical development. Moreover, it can have long-term consequences by impacting the transmission of malnutrition to future generations and contributing to poor birth outcomes in the next generation. Stunting serves as an indicator of insufficient care and upbringing during the early stages of life and is associated with difficulties in learning and community involvement. Consequently, the prevalence and degree of stunting serve as valuable metrics for evaluating a population. They can monitor children's progress within that population as they grow over time (Siswati *et al.*, 2022). In 2022, there were 148.1 million children below the age of five who exhibited stunted growth globally. The prevalence of stunting in 2022 was 22.3% among all children under five years old worldwide (UNICEF *et al.*, 2023). In Indonesia, the prevalence of stunting was decreased to 21,6% (Ministry of Health Republic Indonesia, 2023).

Stunting among children below the age of five often goes unnoticed, as distinguishing between a stunted child and a typically developing child in this age group can be challenging. The period before a child turns five is crucial for shaping the quality of their physical and intellectual development, emphasizing the importance of maintaining good nutritional health. When a child experiences stunting during this critical phase, they may encounter difficulties in achieving their optimal height in subsequent years. This can result in impaired cognitive and psychomotor

Received: 31-10-2023, Accepted: 28-11-2023, Published Online: 02-09-2024

development, reduced intellectual capacity, heightened susceptibility to chronic diseases, and decreased future productivity (Diana & Yusandra, 2022).

Fundamentally, the well-being and survival of children are closely connected to the health of their mothers. Parenting practices influence dietary patterns, including inappropriate feeding behaviors. Studies have indicated a correlation between parenting styles and stunted growth in children. The nutritional knowledge and practices of mothers significantly affect the dietary habits of toddlers (Diana & Yusandra, 2022). A considerable proportion of health problems stem from the identification of unhealthy behaviors, particularly when it comes to children, as these behaviors are often linked to the beliefs, actions, or lack thereof, of mothers (Zoungrana *et al*., 2014). The perspectives and cultural convictions of mothers are significant but have received limited attention as factors that influence the nutritional well-being of children and adolescents (Adeomi *et al*., 2022).

Building upon the findings from previous research, the objective of this study is to gather a comprehensive understanding of the maternal factors that contribute to stunting by reviewing various relevant sources and literature.

METHODS

We conducted a scoping review to examine the maternal factors influencing stunting in children under five. A scoping review is a method employed to comprehensively explore relevant literature from various sources, shedding light on the specific research problem at hand. This review was conducted by three authors. In this review, the authors were responsible for evaluating the abstract, the title and full-text of potential articles for inclusion. The scoping review process, as outlined by Arkset and O'Malley (2005), involves several key steps: (1) defining the research question or the purpose of the review, (2) searching for pertinent literature, (3) selecting relevant literature, (4) mapping and organizing collected data, (5) summarizing and reporting the results, and (6) seeking expert consultation.

The initial search for literatures was implemented on three electronic databases, namely PubMed (biomedical sciences), Scopus (multidisciplinary), and Google Scholar (multidisciplinary). The databases were selected to be comprehensive and to cover a broad range of disciplines. The search format uses PEO (Population, Exposure, Outcome). The search format used in the literature search was based on the research topic, namely, P= children under five; E= maternal factors; and O= stunting. The key to the search is as follows "maternal" or "mothers" and "factor" and "stunting" or "stunted" or "growth disorder" and "toddler" or "children under five."

Based on the first search results using keywords found 1,252 literatures from PubMed, 148 literatures from Scopus, and 50 literatures from Google Scholar. Additionally, the authors chose the retrieved materials from search engines under specific inclusion and exclusion criteria. Inclusion Criteria: articles published in English and those published between 2019 and 2023, articles as the result of the research or original research, free-full text accessed articles, document/report/guideline from the WHO or certain formal institution. Exclusion Criteria: opinion and commentary articles, review letters and book reviews, irrelevant articles

RESULTS AND DISCUSSION

Figure 1 depicts the search results from 1,450 literature sources obtained through the research database using the specified search strategy. According to the sources, the authors retrieved 1252 from PubMed, 148 from Scopus, and 50 from Google Scholar based on the specified keywords. Subsequently, a screening process was employed to select articles that aligned with the scoping review's objectives regarding maternal factors contributing to stunting among children under the age of five. The authors guided the selection process by evaluating the alignment of the title, abstract, and content with the review's objectives. This article selection process adhered to the PRISMA-ScR guidelines.

The pieces of literature were extracted using the Mendeley Desktop application. The number of articles after the duplication checks and removal of not fully accessed articles was 545. Then, the

Received: 31-10-2023, Accepted: 28-11-2023, Published Online: 02-09-2024

filtering of article title and abstract was done manually. Four hundred and forty-eight articles were excluded after the screening because they were irrelevant to the scope of stunting determinants among children under five. After re-selecting manually, the authors found 97 articles. Thirty-nine of them did not contain maternal factors and three of them were a review. Then, 56 articles were found, 14 articles did not fit the population, 26 articles had wrong exposures, and seven articles had wrong outcomes. In the end, nine articles (seven articles from PubMed, an article from Scopus, and an article from Google Scholar) met the criteria for extraction and underwent quality assessment before being included in the data charting process.

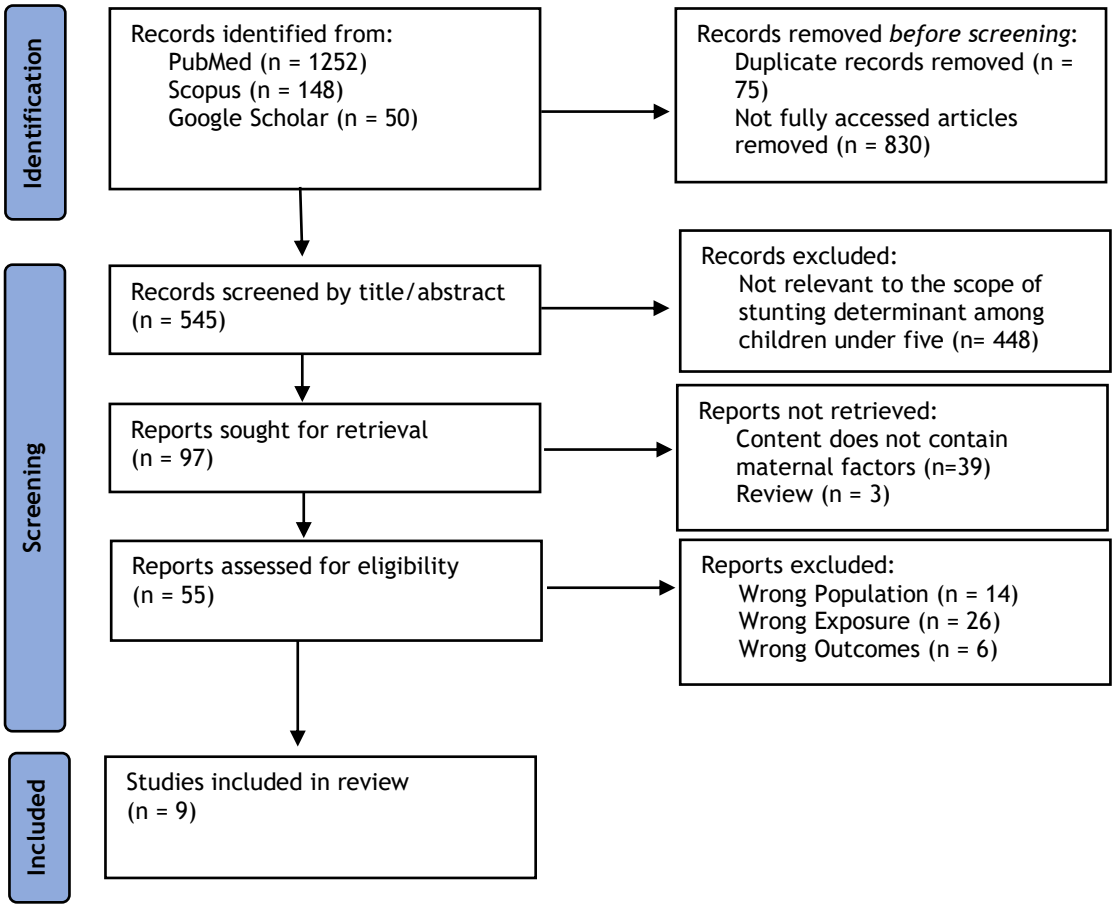

Figure 1. Article Selection Process

Data Charting

Nine articles have been assessed, then extracted by entering the main criteria including research title, author, year, country, purpose, research type, and research results.

Table 1. Data Charting

Title	Database	Country	Objective	Type of Research	Result
Maternal risk factors for underweight among children under five in a resource limited setting: a community based case control study (Sigdel *et al.*, 2020)	PubMed	Nepal	To address the maternal risk factors of underweight children	A case control study	The findings indicated that children born to illiterate mothers had 1.48 times higher odds of being underweight when compared to children whose mothers were not illiterate. Furthermore, children with mothers who had

Received: 31-10-2023, Accepted: 28-11-2023, Published Online: 02-09-2024

					zero income had 5.13 times higher odds of being underweight.
Decomposing acute malnutrition by educational inequality of mother's among under five children in Jammu and Kashmir (Tariq *et al.*, 2023)	Scopus	India	To analyze the prevalence of acute malnutrition concerning educational disparities among mothers	A cross-sectional study	The study revealed a greater incidence of stunting in children with uneducated mothers in contrast to those with educated mothers. The findings illustrate a reduced risk of stunting in children whose mothers are literate.
Factors related to stunting incidence in toddlers with working mothers in Indonesia (Laksono *et al.*, 2022)	PubMed	Indonesia	To examine factors associated with the occurrence of stunting in toddlers with employed mothers	A cross-sectional study	The study indicated that mothers in the 19-29 age group have a 1.461 times higher likelihood of having severely stunted toddlers compared to those in the 30-45 age group.
The targets for stunting prevention policies in Papua, Indonesia: What Mothers' Characteristics Matter? (Wulandari *et al.*, 2022)	Google Scholar	Indonesia	To assess the maternal characteristics that are most suitable for informing stunting prevention policies	A cross-sectional study	The findings revealed that mothers who completed senior high school, junior high school, primary school or lower were more likely to have stunted children compared to mothers with a college education.
The epidemiology of undernutrition and its determinants in children under five years in Ghana (Boah *et al.*, 2019)	PubMed	Ghana	To assess the prevalence of wasting, underweight, and stunting, as well as investigate the factors influencing them	A cross-sectional study	A maternal body mass index in the normal or overweight/obese category, along with high maternal autonomy and a middle-class wealth index, were linked to a reduced likelihood of undernutrition in children. Conversely, factors associated with an increased likelihood of child undernutrition included low birth weight (<2.5 kg), a minimum dietary diversity score (MDDS), and being a higher (4th) birth order child.
Feeding patterns, mother-child dietary diversity and prevalence of malnutrition among under five children in Lebanon: A cross-sectional study based on restropective recall (Abi Khalil	PubMed	Lebanon	To retrospectively analyze the feeding patterns of toddlers and the dietary diversity of mothers and children.	A cross-sectional study	The results showed a strong correlation between the dietary diversity of children and their mothers. The regression analysis revealed that a high maternal DDS was associated with approximately two times increase in the children's DD. When

Received: 31-10-2023, Accepted: 28-11-2023, Published Online: 02-09-2024

et al., 2022)					the household belonged to the highest income bracket, children's DD increased by around 12 times.
Influence of maternal exposure to mass media on growth stunting among children under five: mediation analysis through the Water, Sanitation, and Hygiene Program (Huo *et al.*, 2022)	PubMed	Congo	To investigate the relationship between maternal exposure to mass media and stunting in children	A cross-sectional study	Mothers' exposure to the internet and television in the Democratic Republic of Congo has been shown to significantly reduce the risk of stunting in children by 5% and 10%, respectively.
Maternal employment and child nutritional status in Uganda (Nankinga *et al.*, 2019)	PubMed	Uganda	To investigate the correlation between maternal employment and the nutritional status of toddler	A cross-sectional study	The findings indicated that children whose mothers had secondary education had a reduced likelihood of experiencing stunting and being underweight when compared to children whose mothers had no formal education.
Factors associated with stunted growth in children under five years in Antananarivo, Madagascar and Bangui, Central African Republic (Vonaesch *et al.*, 2021)	PubMed	Central African Republic	To assess and compare the factors linked to stunting in two relatively unexplored urban areas within sub-Saharan Africa	A case control study	In both locations, having a formal maternal education reduced the risk of stunting. Conversely, short maternal stature and having a household head who was different from the parents were associated with an increased risk of stunting. In Antananarivo, continuing breastfeeding was linked to a reduced risk of stunting.

1. Maternal Employment

Several studies have explored the impact of maternal employment on child care and child nutrition. Certain studies have proposed that maternal employment might decrease the available time for child care as a result of work-related demands (Ohonba et al., 2019). Nevertheless, alternative research suggests that the amount of time spent at work does not necessarily lead to a reduction in the time allocated to physical and interactive child care. In fact, earnings from employment can have a positive impact on child nutrition and overall health (Brauner-Otto et al., 2019). Maternal employment has implications for both child and maternal health, with key pathways including income levels and childcare practices.

Income generated and managed by women plays a crucial role in contributing to the finances allocated for child and household nutrition and healthcare. Additionally, the financial status of mothers has been identified as a risk factor associated with underweight in children under the age of five. Studies have shown that children whose mothers have no income are over three times as likely to be underweight compared to

Received: 31-10-2023, Accepted: 28-11-2023, Published Online: 02-09-2024

those whose mothers receive a monthly income (Sigdel *et al.*, 2020).

2. Educational Status of Mothers

Importantly, the findings revealed that the likelihood of stunting was lower among children whose mothers had received primary, secondary, or higher levels of education than children whose mothers had not received any formal education (OR 0.78, 95% CI 0.62–0.97 and OR 0.64, 95% CI 0.47–0.88, respectively) (Nankinga et al., 2019). The results illustrated that children born to more educated women tend to exhibit better nutritional outcomes than those whose mothers do not have formal education. This can be partially attributed to the enhanced autonomy, health knowledge, and empowerment typically associated with educated women. Educated women often have better access to nutritional information, which influences their feeding practices, dietary choices, and healthcare-seeking behavior. This knowledge leads to healthier food selections, including increased consumption of vegetables, fruits, and legumes. Furthermore, education encourages the utilization of vital healthcare services, providing benefits to both children and their mothers (Yabancı *et al.*, 2014).

Furthermore, education can delay the age at which women have their first child, particularly among those who attain secondary education (Bongaarts *et al.*, 2017). This delay in childbearing is likely to result in better child health outcomes. Higher levels of education not only empower mothers to offer improved nutrition to their children but also enhance their understanding of the benefits and drawbacks associated with enhanced nutrition (Tahangnacca *et al.*, 2020a).

3. Maternal Body Mass Index

Maternal BMI has a significant impact on a child's nutritional status both during the pre- and post-pregnancy phases. When a woman is undernourished during pregnancy, it can impact the fetus, categorized as having a thin BMI, and is at a heightened risk of experiencing adverse growth shocks, which can lead to intrauterine growth restrictions (Black *et al.*, 2013). Additionally, undernourished women encounter various challenges, including challenges with breastfeeding, decreased cognitive abilities, and reduced energy levels, all of which can hinder their capacity to provide adequate care for their children. The link between maternal undernutrition and unfavorable nutritional outcomes has been well-documented in Rwanda (Habyarimana, 2016).

4. Mother-Child Dietary Diversity

According to the WHO and UNICEF, Dietary Diversity (DD) measures the range of foods or food groups consumed within a defined time frame, reflecting a household's ability to access a variety of foods. DD acts as a surrogate indicator for assessing the adequacy of nutrients in the diets of mothers and children, especially concerning micronutrient intake, which is a crucial aspect of diet quality. For women, achieving the minimum criteria for a healthy diet involves consuming five or more food groups in the preceding 24 hours, while children should consume four or more food groups (Bosha *et al.*, 2019). Moreover, for children aged 6–59 months, there was a significant lack of dietary diversity among mothers and children, accompanied by a high prevalence of both stunted and overweight children.

A previous study investigated the agreement between child dietary diversity and maternal and the factors influencing this agreement. The findings found that the proportion of discordance was low ($p = 0.03$), indicating that when mothers consumed a greater variety of food groups, their children were more likely to meet their dietary diversity requirements, and vice versa. With an increase in the dietary diversity of mothers, there was a notable rise in the percentage of children (aged 0–59 months) who met this criterion (Abi Khalil *et al.*, 2022).

5. Maternal Exposure to Mass Media

In the Democratic Republic of Congo, prior research found that mothers' exposure to television and the internet could notably decrease the risk of their children experiencing stunting. Maternal exposure to mass media is an indirect determinant of stunting. In low- and middle-income countries in Asia, like Bangladesh and India; children were at a higher risk of severe stunting if their mothers had never been exposed to mass media (Rahman, 2016). One plausible

Received: 31-10-2023, Accepted: 28-11-2023, Published Online: 02-09-2024

explanation for this phenomenon is that mothers can access valuable information about nutrition and childcare through mass media. Mass media may serve as a primary avenue for health intervention and education.

Literature indicated that people's behavior is directly impacted by mass media, and this influence intensifies with advancements in mass media (Zarocostas, 2020). Published works have explored the potential of mass media to disseminate health knowledge and encourage corresponding behaviors (Naugle & Hornik, 2014). Mothers possessing enhanced maternal knowledge are better equipped to grasp the advantages and disadvantages of improved nutrition, adopt appropriate breastfeeding practices, and ensure equitable access to nutritious foods (Tahangnacca *et al.*, 2020b). These factors are crucial in mitigating stunting levels, as identified in previous studies (Pillai & Maleku, 2019).

6. Maternal Age

Maternal factors, including age, have been associated with child health outcomes (Annim *et al.*, 2015; Nigatu *et al.*, 2018). A study conducted in India specifically emphasized that the age at which a mother first marries and her age at delivery are influential factors in child stunting. It was found that getting married at a younger age among mothers was correlated with an increased risk of having severely stunted children (Sethi *et al.*, 2018). Studies addressing stunting have shown that children born to older mothers (age 35-49) have lower odds of stunting compared to children born to younger mothers (age 15-24) (OR 0.69, 95% CI 0.56–0.86). Conversely, older mothers tend to have healthier children than their younger counterparts (Nankinga *et al.*, 2019). Children born to older women are less likely to experience stunting compared to children born to younger mothers.

Early pregnancy can negatively affect fetal development, as the growing fetus demands substantial nutrients, necessitating the mother's own nutritional well-being. Additionally, young mothers often lack access to antenatal care services and may not consult with healthcare professionals because of their limited knowledge and lower levels of education. Consequently, young mothers face a higher risk of giving birth to babies with low birth weight. Furthermore, the psychological immaturity of young mothers can impact their child's upbringing (Kusrini *et al.*, 2021; Laksono & Megatsari, 2020). Moreover, young mothers may struggle to provide exclusive breastfeeding due to low milk supply, which can result in child stunting (Kusrini *et al.*, 2020).

CONCLUSION

This review has provided an overview of maternal factors contributing to the prevalence of stunting. These factors include maternal employment, the educational status of mothers, maternal body mass index, the diversity of the mother-child diet, maternal exposure to mass media, and maternal age. The occurrence of this condition is influenced by socioeconomic status, as well as beliefs. A thorough understanding and a comprehensive approach are essential in evaluating maternal factors as determinants of stunting, given that stunting is inherently multifactorial and interrelated. This review has also summarized the challenges faced by mothers dealing with stunted children and their role in addressing this issue. Illiterate mothers who lack formal education, or are unemployed often encounter difficulties in providing adequate nutrition for their children. Undernourished mothers with low BMI potentially impact their child's nutritional status.

REFERENCES

Abi Khalil, H., Hawi, M., & Hoteit, M. (2022). Feeding Patterns, Mother-Child Dietary Diversity and Prevalence of Malnutrition Among Under-Five Children in Lebanon: A Cross-Sectional Study Based on Retrospective Recall. *Frontiers in Nutrition*, *9*, 815000. https://doi.org/10.3389/fnut.2022.815000

Adeomi, A. A., Fatusi, A., & Klipstein-Grobusch, K. (2022). Children eat all things here': A qualitative study of mothers' perceptions and cultural beliefs about underweight and overweight children and adolescents in selected communities in two Nigerian states. *BMJ Open*, *12*(4).

Received: 31-10-2023, Accepted: 28-11-2023, Published Online: 02-09-2024

https://doi.org/10.1136/bmjopen-2021-059020

Annim, S. K., Awusabo-Asare, K., & Amo-Adjei, J. (2015). Household Nucleation, Dependency And Child Health Outcomes In Ghana. *Journal of Biosocial Science*, *47*(5), 565–592. https://doi.org/10.1017/S0021932014000340

Arksey, H., & O'Malley, L. (2005). Scoping studies: towards a methodological framework. *International Journal of Social Research Methodology*, *8*(1), 19–32. https://doi.org/10.1080/1364557032000119616

Black, R. E., Victora, C. G., Walker, S. P., Bhutta, Z. A., Christian, P., de Onis, M., Ezzati, M., Grantham-McGregor, S., Katz, J., Martorell, R., & Uauy, R. (2013). Maternal and child undernutrition and overweight in low-income and middle-income countries. *The Lancet*, *382*(9890), 427–451. https://doi.org/10.1016/S0140-6736(13)60937-X

Boah, M., Azupogo, F., Amporfro, D. A., & Abada, L. A. (2019). The epidemiology of undernutrition and its determinants in children under five years in Ghana. *PLoS One*, *14*(7), e0219665. https://doi.org/10.1371/journal.pone.0219665

Bongaarts, J., Mensch, B. S., & Blanc, A. K. (2017). Trends in the age at reproductive transitions in the developing world: The role of education. *Population Studies*, *71*(2), 139–154. https://doi.org/10.1080/00324728.2017.1291986

Bosha, T., Lambert, C., Riedel, S., Melesse, A., & Biesalski, H. K. (2019). Dietary Diversity and Anthropometric Status of Mother–Child Pairs from Enset (False Banana) Staple Areas: A Panel Evidence from Southern Ethiopia. *International Journal of Environmental Research and Public Health*, *16*(12), 2170. https://doi.org/10.3390/ijerph16122170

Brauner-Otto S, Baird S, & Ghimire D. (2019). Maternal employment and child health in Nepal: The importance of job type and timing across the child's first five years. *Social Science & Medicine*, *224*, 94–105.

Diana, H. A. H., & Yusandra, E. (2022). Enhancing Maternal Behavior towards Prevention of Stunting among Children Below 5 Years Old in the District of Tebing Tinggi Indonesia. *Malaysian Journal of Nursing*, *14*(2), 67–74. https://doi.org/10.31674/mjn.2022.v14i02.012

Habyarimana, F. (2016). Key determinants of malnutrition of children under five years of age in Rwanda: Simultaneous measurement of three anthropometric indices. *African Population Studies*, *30*(2). https://doi.org/10.11564/30-2-836

Huo, S., Wang, K., Liu, Z., Yang, Y., Hee, J. Y., He, Q., Takesue, R., & Tang, K. (2022). Influence of Maternal Exposure to Mass Media on Growth Stunting Among Children Under Five: Mediation Analysis Through the Water, Sanitation, and Hygiene Program. *JMIR Public Health Surveillance*, *8*(4), e33394. https://doi.org/10.2196/33394

Kusrini, I., Ipa, M., Laksono, A. D., Fuada, N., & Supadmi, S. (2020). The Determinant of Exclusive Breastfeeding among Female Worker in Indonesia. *Systematic Reviews in Pharmacy*, *11*, 1102–1106.

Kusrini, I., Supadmi, S., Mulyantoro, D. K., & Laksono, A. D. (2021). Demographic Characteristics of Mother as Predictor of Low Birth Weight in Eastern Indonesia. *Systematic Reviews in Pharmacy*, *12*, 1514–1518.

Laksono, A. D., & Megatsari, H. (2020). Determinants of Stunting Toddlers in East Java: Analysis of Nutrition Status Monitoring Data 2017. *Amerta Nutrition*, *4*, 109.

Laksono, A. D., Sukoco, N. E. W., Rachmawati, T., & Wulandari, R. D. (2022). Factors Related to Stunting Incidence in Toddlers with Working Mothers in Indonesia. *International Journal of Environmental Research and Public Health*, *19*(17). https://doi.org/10.3390/ijerph19171065 4

Ministry of Health Republic Indonesia. (2023). *Survei Status Gizi Indonesia (SSGI) Tahun 2022*.

Nankinga, O., Kwagala, B., & Walakira, E. J. (2019). Maternal employment and child nutritional status in Uganda. *PLoS One*, *14*(12), e0226720.

Received: 31-10-2023, Accepted: 28-11-2023, Published Online: 02-09-2024

https://doi.org/10.1371/journal.pone.0226720

Naugle, D. A., & Hornik, R. C. (2014). Systematic Review of the Effectiveness of Mass Media Interventions for Child Survival in Low- and Middle-Income Countries. *Journal of Health Communication*, *19*(sup1), 190–215. https://doi.org/10.1080/10810730.2014.918217

Nigatu, G., Assefa Woreta, S., Akalu, T. Y., & Yenit, M. K. (2018). Prevalence and associated factors of underweight among children 6–59 months of age in Takusa district, Northwest Ethiopia. *International Journal for Equity in Health*, *17*(1), 106. https://doi.org/10.1186/s12939-018-0816-y

Ohonba A, Ngepah N, & Simo-Kengne B. (2019). Maternal education and child health outcomes in South Africa: A panel data analysis. *Development Southern Africa*, *36*(1), 33–49.

Pillai, V. K., & Maleku, A. (2019). A Women's Education and Child Stunting Reduction in India. *Journal of Sociology & Social Welfare*, *46*, 111.

Rahman, A. (2016). Significant risk factors for childhood malnutrition: evidence from an Asian developing country. *Science Journal of Public Health*, *4*(1), 16–17.

Sethi, V., Lakhara, K., Kumar, D., Maiti, K. D., Bhattacharjee, S., Dev, V. K., Ahuja, A., Sareen, N., & Agrawal, S. (2018). Severity and determinants of stunting in children under age 2 years in Odisha (India): A tribal v/s non-tribal analysis. *Asian Etlm*, *19*, 489–508.

Sigdel, A., Sapkota, H., Thapa, S., Bista, A., & Rana, A. (2020). Maternal risk factors for underweight among children under-five in a resource limited setting: A community based case control study. *PLoS One*, *15*(5), e0233060. https://doi.org/10.1371/journal.pone.0233060

Siswati, T., Iskandar, S., Pramestuti, N., Raharjo, J., Rubaya, A. K., & Wiratama, B. S. (2022). Drivers of Stunting Reduction in Yogyakarta, Indonesia: A Case Study. *International Journal of Environmental Research and Public Health*, *19*(24). https://doi.org/10.3390/ijerph192416497

Tahangnacca, M., Amiruddin, R., & Syam, A. (2020a). A. Model of stunting determinants: A systematic review. *Enfermeria Clínica*, *30*, 241–245.

Tahangnacca, M., Amiruddin, R., & Syam, A. (2020b). Model of Stunting Determinants: A Systematic Review. *Enfermería Clínica*, *30*, 241–245.

Tariq, I., Khan, J. I., & Malik, M. A. (2023). Decomposing acute malnutrition by educational inequality of mother's among under five children in Jammu and Kashmir. *Scientific Reports*, *13*(1), 10493. https://doi.org/10.1038/s41598-023-37587-y

UNICEF, WHO, & World Bank Group. (2023). *Joint Child Malnutrition Estimates 2023 edn*.

Vonaesch, P., Djorie, S. G., Kandou, K. J. E., Rakotondrainipiana, M., Schaeffer, L., Andriatsalama, P. V., Randriamparany, R., Gondje, B. P., Nigatoloum, S., Vondo, S. S., Etienne, A., Robinson, A., Hunald, F. A., Raharimalala, L., Giles-Vernick, T., Tondeur, L., Randrianirina, F., Bastaraud, A., Gody, J.-C., … Randremanana, R. V. (2021). Factors Associated with Stunted Growth in Children Under Five Years in Antananarivo, Madagascar and Bangui, Central African Republic. *Maternal Child Health Journal*, *25*(10), 1626–1637. https://doi.org/10.1007/s10995-021-03201-8

Wulandari, R. D., Laksono, A. D., Kusrini, I., & Tahangnacca, M. (2022). The Targets for Stunting Prevention Policies in Papua, Indonesia: What Mothers' Characteristics Matter? *Nutrients*, *14*(3). https://doi.org/10.3390/nu14030549

Yabancı N, Kısac¸ İ, & Karakuş SŞ. (2014). The Effects of Mother's Nutritional Knowledge on Attitudes and Behaviors of Children about Nutrition. *Procedia—Social and Behavioral Sciences*, *116*, 77–81.

Zarocostas, J. (2020). How to fight an infodemic. *The Lancet*, *395*(10225), 676. https://doi.org/10.1016/S0140-6736(20)30461-X

Zoungrana, A., Chou, Y. J., & Pu, C. (2014). Socioeconomic and environment determinants as predictors of severe malaria in children under 5 years of age admitted in two hospitals in Koudougou district,

Received: 31-10-2023, Accepted: 28-11-2023, Published Online: 02-09-2024

Burkina Faso: A cross sectional study. *Acta Tropica*, *139*, 109–114. https://doi.org/10.1016/J.ACTATROPICA.2014.07.011

Received: 31-10-2023, Accepted: 28-11-2023, Published Online: 02-09-2024