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THE INFLUENCE OF EARLY MARRIAGE HISTORY ON STUNTING RISK: A SYSTEMATIC LITERATURE REVIEW

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Abstract

Stunting, a chronic growth condition characterized by a height-for-age Z-score below -2 SD of the WHO median, poses significant health, developmental and cognitive challenges. This systematic literature review investigates the relationship between early marriage and the prevalence of stunting, emphasizing its impact on intergenerational malnutrition. Using databases such as ProQuest, Scopus, PubMed and Google Scholar, the study screened 6,679 articles and narrowed them down to 11 high-quality studies based on PRISMA guidelines. Findings showed that children born to teenage mothers face a higher risk of stunting due to lack of nutrition knowledge, limited access to health services and socioeconomic constraints. Early marriage is significantly correlated with high-risk fertility behaviors, including short birth spacing and high parity, which exacerbate stunting rates. In addition, cultural norms that encourage early marriage further exacerbate these challenges. The study highlights the need for multidimensional interventions that focus on delaying marriage and childbirth, improving maternal education, increasing access to healthcare, and empowering women through community-based programs. These strategies aim to break the intergenerational cycle of malnutrition, thereby advancing sustainable development goals and improving children's well-being in the long term.

Keyword: *Stunting, early marriage, teenage pregnancy, maternal health, intergenerational malnutrition.*

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INTRODUCTION

Stunting is a condition of stunted growth in children measured by height-for-age with a z-score, where children are considered stunted if they score below -2 of the WHO growth median. This condition reflects chronic undernutrition and has long-term impacts on children's health, physical development and learning ability. Research suggests that factors such as early marriage and maternal age at delivery contribute to stunting, so effective interventions are needed, especially for children of adolescent mothers (Das et al., 2022a; Hossain et al., 2024). The World Bank reports that by 2020, 22% of the world's children under 5 years old will be stunted, with the global prevalence decreasing from 33.1% in 2000 to 22% in 2020, or approximately 149.2 million children. Most cases of stunting occur in South Asia and sub-Saharan Africa, which each account for nearly two in five stunted children (UNICEF, 2020; WHO, 2021).

Stunting is triggered by various factors, including the need for improvements in diet, parenting, and access to sanitation and clean water. In addition, the level of education, cultural values, and economic conditions of the community also play an important role in determining the prevalence of stunting in a region (Pranata et al., 2021). Early marriage has a major impact on child stunting, as it falls into the category of high-risk fertility behavior. Marriage at a young age increases the likelihood of maternal and child malnutrition, reinforcing the cycle of malnutrition that is passed on across generations.

The United Nations Children's Fund (UNICEF) defines early marriage as a marriage union that takes place before a person reaches 18 years of age. This practice is considered a form of violence against children because it increases their vulnerability to various risks. Children who marry under the age of 18 tend to lose access to education, experience reduced health quality, are at higher risk of being victims of violence, and are trapped in poverty (Hakiki et al., 2020).

Globally, the practice of child marriage is showing a significant downward trend. According to UNICEF (2018), around 21% of young women aged 20-24 were married as children, down from 25% a decade earlier. This decline reflects accelerating change in many countries, with an estimated 25 million child marriages prevented in the last 10 years thanks to effective interventions. However, challenges remain, with an estimated 650 million women and girls currently married before the age of 18. The highest rates are recorded in South Asia, followed by the Sub-Saharan Africa region (Hakiki et al., 2020).

Research shows that teenage pregnancy, too close a birth spacing and a high number of children in a family can limit access to antenatal, postnatal and newborn check-up services, which directly affects the quality of a child's nutrition, from conception to development. Furthermore, mothers with low nutritional status tend to give birth to children at risk of malnutrition, creating a cycle of malnutrition that is difficult to end. Addressing early marriage is therefore a key step in improving child nutritional status and supporting the achievement of sustainable development goals (Das et al., 2022; Ruchita et al., 2022).

Based on the description above, stunting is not only a health problem, but also a multidimensional challenge that includes social, cultural and economic factors, including early marriage which contributes significantly to its prevalence. The practice of early marriage, in addition to violating children's rights, reinforces the intergenerational cycle of malnutrition that impacts children's growth and development. Addressing early marriage and improving access to nutrition, education and health services are strategic steps in reducing stunting. With integrated and evidence-based interventions, it is expected that improving children's nutritional status can support the achievement of sustainable development targets, especially in improving the quality of life of future generations.

METHOD

The databases used in this research are ProQuest, Scopus, PubMed, and Google Scholar. The search results obtained 6,679 articles. The search process used a search strategy with keywords (Mother [MeSH Terms]) OR (Early Marriage [Text Word]) AND (Early Marriage Culture [MeSH Terms]) OR (Teenage Marriage [Text Word]) OR (Teenage Married [Text Word]) OR (Child Marriage [Text Word]) AND (Stunting [MeSH Terms]) OR (Height-for-Age [MeSH Terms]).

The screening process was conducted in two stages : title and abstract screening, followed by full-text screening. The purpose of this screening was to identify studies that met the PICO framework and predetermind criteria. A total of 28 studies were included for full-tect screening. Quality assessment was performed using the HOY Risk of Bias (ROB) tool, and 11 studies were ultimately included in the systematic literature review. This study was designed, conducted, and reported following the 2020 PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) (Page et al, 2021).

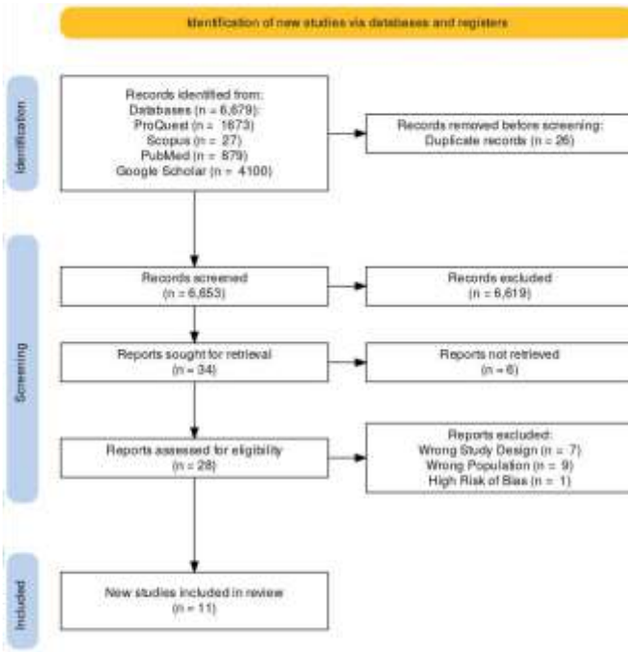

Figure 1. PRISMA Flow Chart

RESULT AND DISCUSSIONS

Based on the findings from the reviewed articles, several studies indicate a significant correlation between early maternal age, particularly teenage mothers, and the occurrence of stunting in children. For instance, a study by Tamirat et al. (2021) using logistic regression analysis revealed that children born to adolescent mother have a higher likelihood of stunting, with an Odds Ratio (OR) of 1.55 (95% CI : 1.39-1.73) and a P-value <0.001. This demonstrates a strong association between maternal age below 18 years and stunting incidence.

Similarly, research conducted by Paul et al. (2019) found that teenage motherhood significantly contributes to the risk of stunting in children. Early marriage during adolescence serves as a risk factor that increases stunting prevalence. The study showed that children of teenage mothers had a 1.40 times greater risk of being stunted compared to those whose mothers married at a latter age (OR = 1.40, 95% CI: 1.36-1.45). These findings further solidify the evidence that early maternal age is a major in child stunting.

Additionally Haque et al. (2022) reported that adolescent mothers who themselves experienced stunting significantly increase the risk of stunting in their children. The study found that children of stunted adolescent mothers had an Odds Ratio of 2.36 (95% CI: 1.96-2.84) for stunting compared to children of non-stunted mothers, with a P-value <0.001. Supporting these results, Das et al. (2022) demonstrated a significant link between high-risk fertility behaviors, such as giving birth at a very young age, and stunting incidence, with an OR of 1.17 (95% CI: 1.09-1.26) and <0.001.

In general, most studies highlight that maternal age below 18 years is a significant risk factor for child stunting. However, some studies reported weaker associations after adjusting for confounding factors like socioeconomic status or birth weight. These findings underscore the importance of implementing targeted interventions aimed a delaying marriage and adolescent pregnancies to reduce stunting prevalence within communities.

No	Author	Title	Study Objectives	Method	Result Study	Conclusion
1	(Hossain et al., 2024)	Understanding the socio-demographic and programmatic factors associated with adolescent motherhood and its association with child undernutrition in Bangladesh	This study examines the impact of early marriage and maternal age at childbirth on children's nutritional status in Bangladesh, aiming to identify contributing factors and support policies to reduce malnutrition in children of adolescent mothers, while	*Quantitative Cross-sectional*	The study found no significant link between being born to teenage mothers (≤19 years) and stunting compared to older mothers (>19 years), with an adjusted Odds Ratio (aOR) of 1.25 (95% CI: 0.97–1.59, P = 0.08). The lack of significance	The study concludes that children of adolescent mothers (≤19 years) face higher risks of malnutrition, including stunting, wasting, and underweight. Early marriage, low maternal education, and poor economic

			improving maternal and child health overall.		may be attributed to differences ini sample size, demographic factors, cultural practices, socioeconomic conditions, maternal nutrition during pregnancy, and access to healthcare services.	status are key contributors. Policies to delay marriage and improve adolescent maternal health are crucial for enhancing child growth and development in Bangladesh.
2	(Das et al., 2022)	Understanding the associations between maternal high-risk fertility behaviour and child nutrition levels in India: evidence from the National Family Health Survey 2015–2016	This study examined the effects of maternal high-risk fertility behaviors on stunting, wasting, and underweight in children under five in India.	*Quantitative Observational Design using a Cross-Sectional approach*	The study found a significant link between maternal high-risk fertility behaviors and increased stunting in children. Risks included childbirth before 18, after 34, intervals under 24 months, or birth order above four. Children of mothers under 18 had an Adjusted Odds Ratio (OR) of 1.17 (95% CI: 1.09–1.26), and mothers over 34 had an OR of 1.53 (95% CI: 1.46–1.59), both with $p < 0.001$. High-risk behaviors contributed to 36% of stunting cases, highlighting the need for interventions to address these risks and improve child nutrition.	The study concludes that high-risk maternal fertility behaviors, such as young or advanced maternal age and short birth spacing, significantly increase the risk of stunting and underweight in children under five. Avoiding these risks, improving health services, and promoting proper feeding practices are essential for reducing child malnutrition in India. Targeted interventions are needed to enhance maternal and child health outcomes.

3	(Mtongwa et al., 2021)	A comparative analysis of determinants of low birth weight and stunting among under five children of adolescent and nonadolescent mothers using 2015/16 Tanzania Demographic and Health Survey (TDHS)	This study analyzed differences and factors influencing low birth weight (LBW) and stunting in children under five born to adolescent mothers (15–19 years) and non-adolescent mothers (≥20 years).	*Quantitative Cross-Sectional*	The study found a stunting prevalence of 34.2% in children of adolescent mothers, slightly higher than 30.6% in non-adolescent mothers. However, after adjustments, no significant difference was found (AOR: 0.97, 95% CI: 0.73–1.29). Stunting is likely influenced more by socioeconomic conditions, maternal nutrition, and antenatal care frequency than maternal age.	The study concludes that adolescent mothers are at higher risk of delivering low birth weight (LBW) infants, but their risk of having a stunted child is not significantly different from non-adolescent mothers.
4	(Laksono et al., 2024)	Determination of appropriate policy targets to reduce the prevalence of stunting in children under five years of age in urban-poor communities in Indonesia: a secondary data analysis of the 2022 Indonesian national nutritional status survey	This study aims to identify policy targets to reduce stunting in urban poor communities in Indonesia by analyzing risk factors, providing recommendations, and raising awareness about the importance of nutrition and health interventions.	*Quantitative Cross-Sectional*	Research in Indonesia shows a significant link between maternal age, particularly for teenage or early-married mothers, and stunting in children under five. Children born to mothers under 20 have a higher risk, though no specific P-value is provided. Another study found that mothers married before 18 also had higher stunting risks. For mothers aged 20-24, the Odds Ratio (OR) of 1.027	The study concludes that to reduce stunting in children under five in urban-poor communities in Indonesia, efforts should focus on vulnerable groups, including younger, less educated, unemployed mothers from poor communities, and those without antenatal care (ANC). It highlights the need for targeted interventions to improve child nutrition and maternal health, along

					(P = 0.057) indicated a trend towards higher risk, though not statistically significant. In contrast, for mothers aged 25-29, the OR of 1.007 (P = 0.628) showed no significant increase in risk, emphasizing maternal age as a key factor in stunting risk.	with policies supporting access to health and education services.
5	(Tamirat et al., 2021)	Determinants of maternal high-risk fertility behaviors and its correlation with child stunting and anemia in the East Africa region: A pooled analysis of nine East African countries	This study examines the link between maternal high-risk fertility behaviors and stunting and anemia in children, focusing on factors like maternal age, birth order, and birth interval. It aims to provide insights for developing effective public health interventions to address child malnutrition in East Africa.	*Quantitative*	This study found that maternal age below 18 at childbirth significantly increases the risk of stunting, with children born to mothers under 18 having a 1.55 times higher chance of stunting (AOR = 1.55, 95% CI: 1.39-1.73). The results stress the importance of reproductive health education and interventions to prevent early marriage and pregnancy.	This study concludes that high-risk fertility behaviors, including early marriage, significantly impact child health, increasing the risk of stunting and anemia. With 57.6% of women in the study area engaging in such behaviors, the prevalence of stunting and anemia in children was 38.9% and 54.2%, respectively. The study highlights the need for improved public health interventions to address these issues and enhance maternal and child health in East Africa.

6	(Fuada et al., 2020)	Assessment of Nutritional Status of Children Under-Five ini Families of Adolescent Mothers in Indonesia 2013	This study aims to examine factors influencing the nutritional status of children under five, focusing on those born to adolescent mothers (10-19 years).	*Quantitative Cross-Sectional*	The study found that children born to mothers under 15 had an Odds Ratio (OR) of 0.667 (95% CI: 0.264-1.686) for stunting, with a P-value of 0.526. Although there was a trend toward lower stunting risk, the result was not statistically significant, possibly due to factors like nutrition, health practices, mental well-being, and socioeconomic conditions.	This study concludes that adolescent mothers' clean and healthy behaviors are significantly linked to better nutritional status in their children, particularly in the underweight category. Mothers with good health behaviors tend to have healthier children. Additionally, mental emotional disturbances in adolescent mothers increase the risk of underweight and stunting, although maternal age below 15 was not significantly associated with stunting. The study recommends integrating mental health counseling into maternal and child health programs, promoting healthy behaviors, and preventing early marriage. It emphasizes the importance of mental health support and healthy behaviors to improve

						children's nutritional status.
7	(Haque et al., 2022)	Stunting Status of Ever-Married Adolescent Mothers and Its Association with Childhood Stunting with a Comparison by Geographical Region in Bangladesh	This study aims to explore factors affecting the nutritional status of adolescent mothers and their impact on stunting in children in Bangladesh.	*Quantitative Cross-Sectional*	This study found a significant link between adolescent motherhood and stunting in children. Children born to adolescent mothers had an Odds Ratio (OR) of 2.36 (95% CI: 1.96-2.84) for stunting compared to those of non-adolescent mothers, with a P-value < 0.001. These findings highlight the need for targeted interventions for adolescent mothers to address malnutrition and improve children's nutritional outcomes. Adolescent mothers were defined as women aged 10 to 19 years who were married and had children.	The study found that adolescent mothers who are stunted have a 2.36 times higher risk of having stunted children. A mother's education level significantly influences child nutrition, with more educated mothers tending to have healthier children. The higher stunting rates in Sylhet Region highlight the need for region-specific interventions. The study recommends improving women's education, nutrition interventions, and protection against domestic violence to reduce stunting, emphasizing the need for broader maternal and child health programs in vulnerable populations in Bangladesh.
8	(Nguyen et al., 2021)	Adolescent birth and child undernutrition: an analysis of demographic	This study examines the link between maternal age at childbirth and stunting in	*Quantitative Cross-Sectional*	Analysis of Bangladesh Demographic and Health Surveys	This study concludes that teenage births, particularly among very

		and health surveys in Bangladesh, 1996–2017	children in Bangladesh, focusing on how early marriage and teenage pregnancies impact child nutrition and identifying other factors contributing to undernutrition.		(BDHS) data revealed a significant link between maternal age at childbirth and stunting. Logistic regression showed that children born to mothers aged 10-15 years had an Odds Ratio (OR) of -0.29 ($p < 0.001$), indicating a higher risk of stunting compared to those born to mothers aged 20 or older. For mothers aged 16-19, the OR was -0.10 ($p < 0.001$), showing a significant but lower risk. These findings highlight that younger maternal age increases the likelihood of stunting in children.	young mothers (10-15), are linked to a higher risk of stunting and underweight in children. Despite a gradual decline in teenage birth rates from 1996 to 2017, children of teenage mothers still have poorer nutritional outcomes. The research highlights the need for policies focused on improving women's education, poverty reduction, and access to healthcare to delay early marriage and childbirth, ultimately improving child health and growth.
9	(Paul et al., 2019)	Impact of child marriage on nutritional status and anaemia of children under 5 years of age: empirical evidence from India	This study aims to examine the link between early marriage (or adolescent motherhood) and child nutrition and anemia in children under five. It seeks to understand how early marriage impacts child health and nutrition, while identifying factors contributing to nutritional issues in children of young mothers.	*Quantitative Cross-Sectional*	The study found a significant link between teenage motherhood and stunting, with an Odds Ratio (OR) of 1.40 (95% CI: 1.36-1.45), indicating that children born to teenage mothers are 1.40 times more likely to experience stunting compared to those born to older mothers.	This study concludes that early marriage negatively impacts children's nutrition, with children of mothers married before 18 having a higher risk of stunting, underweight, and anemia compared to those born to mothers married at 18 or older. The findings

					Although the P-value was not provided, the result is typically considered statistically significant (*P < 0.05), emphasizing the role of early marriage in increasing the risk of stunting.	highlight the need for interventions to address early marriage and improve child health and nutrition in India.
10	(Čvorović, 2022)	Maternal age at marriage and child nutritional status and development: evidence from Serbian Roma communities	This study aimed to assess the link between maternal age at first marriage and the nutritional status and development of Roma children in Serbia, focusing on whether early marriage negatively impacts child health and development, while considering socio-demographic factors.	*Quantitative Cross-Sectional*	This study found a significant link between maternal age at first marriage and child stunting. Children aged 0-35 months born to younger mothers had a lower risk of stunting (OR = 0.67, P = 0.01), while children aged 36-59 months had a higher risk (OR = 1.80, P < 0.01). Approximately 64% of Roma mothers married before 18, with 35% marrying between 10-15 years and 29% between 16-17 years, with early marriage linked to increased health risks, including stunting.	The study concludes that while early marriage may be linked to stunting in Roma children, this relationship is not always significant when considering factors like maternal education, birth weight, and sanitation. Socio-economic and environmental factors have a stronger impact on child nutrition and development than maternal age at marriage, suggesting that while early marriage may contribute to nutritional issues, other variables play a more dominant role in determining children's well-being.
11	(Wells et al., 2022)	Associations of maternal age at	This research examines the link between maternal	*Quantitative Kohort*	The study found that mothers who	This research concludes that early marriage

	marriage and pregnancy with infant undernutrition: Evidence from first-time mothers in rural lowland Nepal	age at marriage and pregnancy and children's nutritional status, focusing on stunting in children born to young mothers.	became pregnant at 16 had a significantly higher risk of having stunted children, with an Odds Ratio (OR) of 1.64. This suggests that children of 16-year-old mothers are nearly twice as likely to be stunted. Although the risk of stunting was also higher for mothers who became pregnant at 18 (OR = 1.58), the result was not statistically significant. These findings highlight that younger maternal age increases the risk of stunting, with special attention needed for teenage pregnancies in stunting prevention efforts.	and pregnancy are linked to a higher risk of stunting in children. Younger maternal age negatively affects children's nutritional status, influenced by factors like maternal education and social standing. The findings highlight the importance of interventions aimed at empowering women, improving education, and supporting policies that address these issues in vulnerable populations to reduce stunting and enhance child health.

SYSTHESIZING FINDINGS

The process of synthesizing and presenting findings used the method of summarizing estimates of the Adjusted Odds Ratio value. It was found that the median aOR value was 1.17, indicating the risk of stunting in adolescent mothers (IQR=0.82 - 1.475; 11 studies). Below is a box plot of the summarizing estimate results using R Studio.

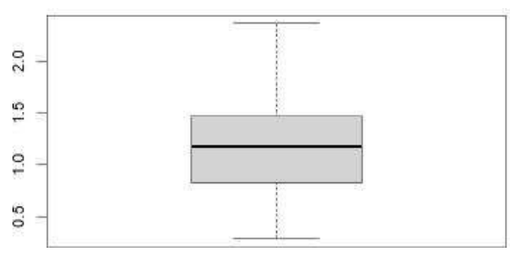

Figure 1. Box Plot Summarizing estimates

The relationship between maternal age, especially adolescent mothers, and the incidence of child stunting has received significant attention in recent years. This systematic literature review synthesizes findings from multiple studies,

revealing complex interactions between maternal age, socio-demographic factors and child nutritional outcomes. The results show that children born to teenage mothers are at higher risk of stunting, a condition that has long-term implications for physical and cognitive development. Of the 11 literatures, there were 3 literatures that found statistically insignificant results and 9 literatures that found significant results between maternal age at childbirth, including early marriage, and the incidence of stunting.

Several studies in this review showed a significant association between maternal age less than 18 years and the risk of stunting. For example, the study conducted by Tamirat et al. (2021) reported an Odds Ratio (OR) of 1.55 (95% CI: 1.39- 1.73), indicating that children born to mothers at this age have a higher risk of stunting compared to children of older mothers. This finding is in line with the broader literature, which indicates that motherhood at a young age is often associated with limited nutritional knowledge, inadequate access to healthcare, and low socioeconomic conditions, all of which result in poor child health. The research also shows that early marriage and teenage motherhood are associated with lower education levels and limited socioeconomic opportunities for women. This correlation is particularly pronounced in low- and middle-income countries, where socio- economic challenges often exacerbate the conditions young mothers face. The study also noted that most mothers of stunted children have low levels of education, with 61.66% having only a secondary school diploma. These educational limitations may hinder their ability to access necessary health information and resources, which are critical to ensuring optimal prenatal and postnatal care (Roy & Sana, 2024).

Research from Shanta Mim in 2024 also highlighted a significant correlation between early marriage and the nutritional status of mothers and children under five, especially in the context of stunting. The prevalence of stunting among children of mothers who married before the age of 18 was higher, with an Adjusted Odds Ratio of 1.201, indicating a 20.1% increase in the odds of stunting compared to children of mothers who married at or after the age of 18. This association is particularly important, as stunting is a chronic condition that results from inadequate nutrition during critical growth periods, including pregnancy and early childhood (Shanta et al, 2024).

Early marriage often leads to teenage pregnancy, which is associated with a range of adverse health outcomes for both mother and child. Teenage mothers typically have limited access to education and health services, which can exacerbate the risk of malnutrition. This study highlights that only 18.2% of women in Bangladesh are highly educated, suggesting that most mothers may lack the necessary knowledge and resources to ensure optimal nutrition for themselves and their children. In addition, findings suggest that mothers who marry early are more likely to experience chronic energy deficiency, further compounding the risk of malnutrition in their children. This relationship is particularly concerning given that malnutrition in early childhood can lead to long-term developmental problems, including cognitive impairment and increased susceptibility to disease (Shanta et al, 2024).

The review also identified high-risk fertility behaviors as significant contributors to stunting. Behaviors such as too close birth spacing and high birth order were associated with an increased risk of child stunting. The Adjusted Odds Ratio for stunting in children born to mothers with high-risk fertility behaviors was reported to be 1.25 (95% CI: 0.97-1.59), indicating a trend towards increased risk, although not statistically significant. This finding emphasizes the need for comprehensive reproductive health education and family planning services to mitigate these risks (Das et al., 2022).It also highlights the role of cultural and societal norms related to early marriage and motherhood. In many regions, early marriage is common, often driven by socio-cultural factors that prioritize traditional gender roles and limit women's autonomy. Addressing these cultural norms through community engagement and education is critical to reducing the incidence of early marriage and the associated health risks (Čvorović, 2022).

Studies that did not show significance may be influenced by several factors, such as variations in sample size, demographics, cultural practices, socioeconomic status, maternal nutrition during pregnancy, health behaviors, mental well-being, access to health services, and ANC visit status. For example, on the quality of nutrition variable, research shows that the quality and quantity of nutrition mothers receive during pregnancy and after childbirth has more influence on child growth than maternal age. Younger or older mothers can provide good nutrition if they have adequate knowledge and access to nutritious foods (Fuada et al., 2020).

The implications of these findings are significant and suggest that interventions to reduce stunting should be multidimensional. Strategies implemented should include the promotion of delayed marriage and childbearing, improved maternal education, and increased access to health services. In addition, community-based programs that empower young women and provide resources to make informed reproductive choices are also needed.

CONCLUSION

Based on this systematic review, it can be concluded that maternal age, especially teenage mothers, has a significant relationship with the incidence of stunting in children. Children born to young mothers are at higher risk of stunting, which is caused by various factors, such as limited nutritional knowledge, limited access to health, and low socioeconomic conditions. Early marriage is a major factor, as it often leads to teenage pregnancies associated with suboptimal nutrition and parenting practices.

In addition, high-risk fertility behaviors, such as short birth spacing and high birth order, also increase the risk of stunting. Social and cultural norms that support early marriage are also significant barriers to breaking this cycle. Therefore, effective interventions must be multidimensional, including promotion of delayed age of marriage and birth, improved education for mothers, improved access to health services, and empowerment of women through community-based programs. These strategies not only help reduce stunting, but also support children's long-term development and women's well-being.

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