Effects of Teenage Pregnancies on Child Malnutrition in Low and middle-income Countries

Abstract

Background: Teenage pregnancy is a major public health concern, especially in low- and middle-income countries, due to various social, economic and cultural influences on teenage girls. These pregnancies prove to have negative long-term effects on the health status of both the mother and the child where there are high risks of further complications and poor nutrition among the pregnant woman and the unborn child.

Methodology: This review combined searches from databases such as PubMed, Scopus, Web of Science and Google Scholar. The main languages of the included articles were restricted to English, and the themes for the search were limited to teenage pregnancies and child malnutrition. The selection criteria were studies published between 2010 and 2023, and peer-reviewed articles that involved adolescent mothers between the ages of 10-19 years and different child nutrition outcomes.

Results: This study shows that teenage mothers are more likely to suffer some pregnancy complications, such as anaemia, which is made worse by poor maternal diets. These complications result in poor child health outcomes including stunting, wasting and low birth weight. The review revealed influential factors related to teenagers' pregnancy including poverty, illiteracy, early marriage and unavailability of reproductive health facilities to all. Conversely, high-income countries record fewer incidences of these outcomes owing to improved and enhanced medical care services and social welfare provisions.

Conclusion: Findings from this review underscore issues that require intervention such as; education on the broader aspects of sexual and reproductive health, access to healthcare services, socio-economic empowerment, and addressing cultural factors through community mobilization. The realization of these strategies can greatly enhance maternal and child health outcomes. Future research should incorporate longitudinal designs and employ panel data analysis to investigate other social and economic effects of teenage pregnancy.

Keywords: Adolescent mothers, Child malnutrition, Low- and middle-income countries, Maternal health,Teenage pregnancy

1. Introduction

Teenage pregnancy remains a critical area of concern with regards to reproductive health since every year, about 21million girls aged 15 to 19 years get pregnant, with the majority coming from LMICs (Lassi et al., 2021). The highest rates are recorded in sub-Saharan Africa with about 143 births per 1,000 girls aged 15-19 years (Adegbola & Sanusi, 2019). Other regions with high teenage pregnancy include Latin America and South Asia, which increases maternal and neonatal morbidity and mortality in these areas (Runsewe-Abiodun & Bondi, 2013). Some of the socio-

economic aspects associated with these elevated rates include ill-health, illiteracy, and early marriage which are allowed in most cultures (Shaw et al., 2006; Jonas et al., 2016). Lack of proper healthcare especially in the areas of sexual and reproductive health compounds the problem thus making teenage girls experience repeated pregnancy cycles (Dongarwar& Salihu, 2019). Several health risks amount to adolescent pregnancies and these affect the health of both the mother and the child. Teenage mothers are at a higher risk of complications during pregnancy like preterm delivery, low birth weight (LBW), and increased neonatal mortality rate; this is because the mother is biologically immature and may not have received adequate antenatal care (Emani & Shetty, 2018; Lassi et al., 2021). These complications are further preceded by socio-economic inequities, such as health care access, literacy levels, and physical living environment (Ramakrishnan et al., 2012; Rahman et al., 2020). In addition, psychological pressure resulting from teenage pregnancy in most cases results in negative mental health consequences and this in turn affects the capability of the young mother to optimally cater for her child (Cantlay, 2015). The continuity of poverty and poor health among teenagers and their offspring as a result of teenage pregnancy highlights the need for more efforts to be made in addressing teenage pregnancy (Tomkins, 2001).

Childbearing age, also known as maternal age, has been identified as being fundamental to the health of the woman and her offspring. This arguably means that teenage pregnancies are associated with child malnutrition. Suboptimal maternal nutrition during pregnancy particularly observed among teenage pregnancies is associated with intra-uterine growth restriction (IUGR), LBW, stunted growth (Nguyen et al., 2019), and other adverse developmental outcomes in later years (Imdad & Bhutta, 2012; Triunfo& Lanzone, 2014). In addition, teenage mothers tend to delay and inadequately sustain appropriate breastfeeding practices, thus resulting in poor child nutrition (Lassi et al., 2020). Socio-economic factors for instance poverty, illiteracy, and poor health also contribute to the high incidence of child malnutrition among children born to teenage mothers (Stephenson et al., 2000). Furthermore, the living environment of teenage mothers and their children, with poor levels of facilities and sanitation, and increased incidence of infections increase the risk of malnutrition (Urgell-Lahuerta et al., 2021). Due to the high prevalence of teenage pregnancies in developing countries, this paper seeks to review existing literature on the impact of teenage pregnancy on children's nutritional status. Findings from this study will provide knowledge on measures to be adopted in the policies and programs that would allow for a decrease in the rate of teenage pregnancy and better child health outcomes (Vohr et al., 2017; Nguyen et al., 2019).

2. Methodology

2.1 Search strategy

For this study assessing the impact of teenage pregnancies on child malnutrition, several databases including PubMed, Scopus, Web of Science and Google Scholar were searched comprehensively for articles (Table 1). The choice of these databases was based on the comprehensive search for sources of biomedical, social science and public health literature. The

search terms applied include the keywords and MeSH terms to cover a wide range of related articles. The keywords included: “teenage pregnancy”, “adolescent pregnancy”, “child malnutrition”, “maternal age”, “maternal nutrition”, “birth outcomes”, “stunting”, “wasting”, “low birth weight”, “maternal health”, “neonatal outcomes” and “pregnancy complications”. Boolean operators (AND, OR) were used to combine these terms and refine the search results.

2.2 Selection criteria

The eligibility criteria for the review included studies published in peer-reviewed journals that focused on the relationship between teenage pregnancy and child malnutrition, specifically involving adolescent mothers (ages 10-19) and various child nutritional outcomes like stunting and wasting. The studies needed to be conducted across different geographic regions and published in English. Exclusion criteria ruled out studies that focused solely on adult pregnancies, lacked direct data on child malnutrition, or were non-peer-reviewed articles like case reports, reviews,and opinion pieces. The study selection involved a two-stage screening process using Zotero, where titles and abstracts were first reviewed by two independent reviewers, followed by a full-text screening to ensure relevance. Discrepancies were resolved through discussion and consultation with a third reviewer.

2.3 Data extraction and synthesis

Data extraction was performed using a standardized form to collect detailed information about study characteristics, determinants of teenage pregnancies, and maternal and child outcomes. For result synthesis, a narrative approach was employed. The included studies were discussed following key themes such as the determinants of teenage pregnancies in low- and middle-income countries and the effects of teenage pregnancies on child malnutrition. The synthesis of results was presented in both tables and narrative analysis, providing insights into the relationships between teenage pregnancies and child malnutrition, while also identifying gaps in the literature that suggest areas for future research.

Table 1 Methodology

Literature Search Strategy	
Literature Sources	PubMed, Scopus, Web of Science, Google Scholar
Keywords	"teenage pregnancy," "adolescent pregnancy," "child malnutrition," "maternal age," "maternal nutrition," "birth outcomes," "stunting," "wasting," "low birth weight," "maternal health," "neonatal outcomes," "pregnancy complications"
Boolean Operators	AND, OR
Selection Criteria	
Inclusion Criteria	Studies on the relationship between teenage pregnancy and child

	malnutrition; Focus on adolescent mothers (ages 10-19); Studies published in peer-reviewed journals in English
Exclusion Criteria	Studies focusing solely on adult pregnancies; Studies lacking direct data on child malnutrition; Non-peer-reviewed articles
Data Extraction and Synthesis	
Data Extraction	Performed by two independent reviewers using Zotero; Discrepancies resolved through discussion
Result Synthesis	Narrative synthesis method; Thematically organized results based on key themes

3. Results and Discussion

3.1 Determinants of Teenage Pregnancy

This review revealed that poverty is the most prevalent determinant of teenage pregnancy in South Asia and Sub-Saharan Africa, with adverse maternal and child health outcomes. This supports the study conducted on Indian adolescents by Nguyen et al. (2019) and Pakistani adolescent by Ramakrishnan et al. (2023), where poverty coupled with low education and health care literacy was proved to be factors that led to high teenage pregnancy rate (Nguyen et al., 2019; Ramakrishnan et al., 2023). These results are in harmony with the findings of Chandra-Mouli et al. (2014) whose systematic review identified economic difficulties as one of the key determinants of adolescent pregnancy in the LMICs. Conversely, research carried out in high income countries like United Kingdom by Harden et al (2009) have shown that while poverty is remains a threat, teenage child bearing is much associated with social exclusion, family breakdown, and school drop outs (Harden et al., 2009). Cultural norms and early marriage also emerges most clearly among the determinants of teenage pregnancy in South Asia and Sub-Saharan Africa. The studies by Nguyen et al. (2017) and Adeyinka et al. (2010) also show that cultural beliefs for practicing early marriage leads to increased teenage pregnancies (Nguyen et al., 2017; Adeyinka et al., 2010). Raj et al. (2010) also noted that societal practices concerning early marriage are correlated with teenage pregnancy (Raj et al., 2010). On the other hand, teenage pregnancy in the developed countries like the United States can be attributed to other factors such as peer pressure, lack of education on sexuality and lack of access to birth control since most of the pregnancies occur outside marriage (Kearney & Levine, 2012). Education is another important predictor that is consistent across the revied studies and is the most correlated factor to teenage pregnancy.A cross sectional study done by Masuku et al. (2015) in South Africa pointed out that an upward trend in teenage pregnancy was due to the low level of education among many girls (Masuku et al., 2015). This concurs with prior research conducted by Lloyd and Mensch (2008) wherein they affirmed that school attendance significantly decreases the probability of teenage pregnancy (Lloyd & Mensch, 2008). In high-income countries (HICs), education also has such protective effect, but the pathways are not the same. For instance in United States, school based sexual health services including condoms and

comprehensive sex education are considered instrumental when it comes to teenage pregnancy prevention among teenagers (Santelli et al., 2006). This study underscores the importance of girls' education program in LMICs which besides enabling girl to go to school include provision of culturally and economically appropriate reproductive health education.

Table 2 Summary of included studies

Author & year	Study Design	Country	Sample size & Demographics	Objectives	Determinants of Teenage Pregnancy	Maternal outcomes	Child outcomes
Nguyen et al. (2019)	Cross-sectional	India	6,626 Adolescent mothers (15-19 years)	To examine the relationship between adolescent pregnancy and child undernutrition.	Poverty, lack of education, early marriage	Limited prenatal care, poor nutritional status	High prevalence of stunting and wasting
Ramakrishnan et al. (2023)	Longitudinal observational study	Pakistan	823 Adolescent women (<20 years)	To investigate the relationship between maternal nutritional status before and during pregnancy and birth outcomes.	Early marriage, poverty, lack of access to reproductive health services	Poor preconception and pregnancy nutrition	Adverse birth outcomes, low birth weight
Alam et al. (2010)	Cross-sectional	Bangladesh	2,502 Adolescent mothers (13-19 years)	To determine the impact of maternal age on child malnutrition in a rural setting.	Early marriage, poverty, limited access to healthcare	High prevalence of undernutrition among mothers	Increased rates of stunting and underweight in children
Nguyen et al. (2017)	Cross-sectional	Vietnam	2,742 Adolescent mothers (15-19 years)	To investigate the relationship between teenage pregnancy and child nutritional status in Vietnam.	Poverty, cultural norms, lack of education	Limited access to prenatal care	Increased risk of stunting and underweight
Adeyinka et al. (2010)	Cross-sectional	Nigeria	1,500 Adolescent mothers (10-19 years)	To assess the prevalence and determinants of adolescent pregnancy and its effects on neonatal	Cultural norms, poverty, limited access to reproductive health services	High prevalence of anemia, poor prenatal care	Increased risk of neonatal death, low birth weight

outcomes.

Table 2 Cont'd

Author & year	Study Design	Country	Sample size & Demographics	Objectives	Determinants of Teenage Pregnancy	Maternal outcomes	Child outcomes
Kawakatsu et al. (2014)	Prospective cohort	Kenya	821 Teenage mothers (<20 years)	To investigate the impact of teenage pregnancy on child nutrition outcomes in rural Kenya.	Poverty, cultural norms, early marriage	Poor maternal nutritional status, limited health services	Higher rates of stunting and underweight
Fekadu et al. (2015)	Cross-sectional	Ethiopia	1,134 Adolescent mothers (15-19 years)	To explore the association between adolescent pregnancy and child malnutrition in a rural Ethiopian setting.	Poverty, lack of education, cultural norms	High rates of anaemia and undernutrition	Increased prevalence of stunting and wasting
Masuku et al. (2015)	Cross-sectional	South Africa	2,130 Adolescent mothers (15-19 years)	To explore the relationship between teenage pregnancy and child health outcomes in South Africa.	Poverty, limited access to education, family instability	High prevalence of anemia, limited access to healthcare	Increased risk of stunting and developmental delays
Somba et al. (2014)	Cross-sectional	Tanzania	3,212 Adolescent mothers (15-19 years)	To investigate the determinants of adolescent pregnancies and their impact on child health in Tanzania.	Early marriage, poverty, limited access to reproductive health services	High prevalence of anemia, poor prenatal care	Increased risk of low birth weight and infant mortality
Munyikwa et al. (2019)	Cross-sectional	Zimbabwe	1,245 Adolescent mothers (15-19	To assess the impact of teenage pregnancies on child	Poverty, cultural norms, limited access to	Limited prenatal care, poor nutritional	Increased prevalence of stunting and

	years)	malnutrition in Zimbabwe.	reproductive health services	health	status	wasting

3.2Effects of Teenage Pregnancies on Child Malnutrition

In this review, findings presented reveal that teenage pregnancies are highly correlated with higher risks of child malnutrition in the South Asian and Sub-Saharan African regions (Table 2). Research conducted in India by Nguyen et al. (2019) indicate that children born to adolescent mothers are more likely to suffer from stunting and wasting as compared to other children (Nguyen et al., 2019). Ramakrishnan et al., (2023) reaffirm these results in the case of Pakistan where children born to adolescent mothers are more likely to suffer from low-birth-weight as well as other indicators of poor maternal nutrition prior to and during pregnancy (Ramakrishnan et al., 2023). These outcomes are in agreement with Black et al.'s (2013) study that explored how adolescent child bearing and suboptimal maternal nutrition have further consequences on child growth and development (Black et al., 2013). Comparatively, while a link between teenage pregnancies and childhood malnutrition has also been evidenced in HICs, the incidence and severity are reported to be considerably lower mainly due to enhanced healthcare, nutritional and social services (Scholl & Hediger, 1993).Alam et al. (2010) characterized adolescent mothers in Bangladesh as having low nutritional status, and as such exert a negative influence on fetal growth hence, higher prevalence of stunting and underweight among their children (Alam et al., 2010). This same notion is supported by Nguyen et al. (2017) in Vietnam, where poor diet by mothers and lack or access to pre-natal and antenatal care were cited as some of the leading causes of poor child health (Nguyen et al., 2017). Likewise, Rahman et al. (2016) highlighted the importance of maternal nutrition in influencing the Newborn and Infant health outcomes particularly in settings with higher teenage pregnancy rates (Rahman et al., 2016). In most of the HICs, the negative impacts, which are brought about by teenage pregnancy on child malnutrition are usually counteracted by proper pre- and post-natal care (Fraser et al., 1995).The effects of teenage pregnancies on child malnutrition are compounded by cultural and socio-economic factors. Adeyinka et al. (2010) observed that cultural practices that encourage early marriage among adolescent girls and child bearing raised neonatal mortality and LBW among babies of teenage mothers in Nigeria (Adeyinka et al., 2010). Likewise, Kawakatsu et al. (2014) in Kenya acknowledged that poverty and inadequate healthcare utilization also determined the elevated incidences of stunting and underweight in the children (Kawakatsu et al., 2014). These findings support a previous study by Victora et al. (2008) revealing that socio-economic vulnerability together with compromised health systems results to poor nutrition among children of teenage mothers (Victora et al., 2008). While the effects of socio-economic differences are present in HICs, they are less pronounced in terms of child malnutrition owing to improved social protection measures and health policies (Vohr et al., 2017). The age-related negative effects of adolescent pregnancy on child health and development such as developmental delays and chronic malnutrition underscores the need for early interventions to help these adolescents escape the poverty and poor health cycle (Fekadu et al., 2015; Masuku et al., 2015).

3.3Policy Implications

The implications of the findings outlined in this review include policy strategies for improving maternal and child health (MCH) health outcomes in LMICs and more specifically regarding teenage pregnancy. The solution to teenage pregnancies should therefore focus on the aspects of

socio-cultural practices that coerce young ladies into early marriages with the aim of minimizing its impact. Consequently, efforts should be made to expand the provision of comprehensive sexual and reproductive health education in national policies and curricula because inadequate education is one of the major determinants of teenage pregnancy and thus has adverse health implications. Such ways include providing adolescents with information on births and pregnancies as well as advocating for delayed childbirth, thereby enabling the government to lower the rates of teenage pregnancy by arming youth with the knowledge of contraception. Strategies such as increasing the spread of subsidized contraceptive services, enhancement of health facilities in rural regions, and guaranteeing the availability of adolescent services are therefore more appropriate for policymakers.While promoting education and access to healthcare remains vital, it is critical to fight the social and economic pressures leading to teenage pregnancy. Hunger and poverty are among the root causes of early marriage and adolescent pregnancy, which means that policies should encourage investment in girls' and women's economic power. Such policies includes provision of scholarship and vocational training to improve their employability, and would make them less pressured to be married. Cultural beliefs also contribute to this in a major way and community sensitization and education could help to change the perceptions of early marriage and teenage pregnancy. The government should intervene in communities by launching programs through local authorities encouraging delayed marriage and better reproductive pace. Moreso, it is important to emphasize specific nutritional interventions, as adolescent mothers are found to have a high prevalence of anaemia and poor nutrition. Targeted supplementary feeding programs for pregnant teenagers should be incorporated into the maternal healthcare delivery systems for enhanced outcomes among young mothers and their children. Ongoing assessment of the impact of these policies is crucial to establishing whether or not they are beneficial in enhancing the health status of women and children.

3.4Limitations and Future directions

There are several limitations pertinent to this review. Firstly, the review was conducted based on studies available in English only, implying that many potentially valuable studies conducted in other languages may have been overlooked.Majority of the included studies were based on cross-sectional and observational designs only, thus it is unlikely that a clear causal link between teenage pregnancy and child malnutrition can be made. Another limitation in the review relate to the heterogeneity of the studies in terms of regional context and the fact that many studies relied on self-reported data. Also, the review failed to incorporate the outcome of teenage pregnancies on families and communities thus giving limited information of the extended effects of teenage pregnancies. To build on this knowledge, future studies should incorporate longitudinal designs, include non-English language studies and qualitative research to have a richer understanding of the cultural and socio-economic influences.

4. Conclusion

This study emphasizes that teenage pregnancies result in poor maternal and child health in LMICs because adolescent mothers suffer from poor nutrition, inadequate prenatal care and consequently,experience high incidence of anemia, premature birth and associated poor newborn

health outcomes including stunting, wasting, and low birth weight. This calls for further formulation of effective policies in the social, economic, educational and health sectors targeting young people in these regions, to reduce teenage pregnancies. Recommendations include conducting policy advocacy to ensure provision of accurate sexual and reproductive health education in schools, increasing access to reproductive health services, addressing socio-economic dependencies by empowering girls and women, and changing cultural norms through community mobilization for campaigning against early marriage and teenage pregnancies. The adoption of these research-informed policies and interventions can make valuable contributions to achieving the maternal and child health targets in LMICs.

Abbreviations

HICs – High Income Countries

IUGR – Intra-uterine Growth Restriction

LBW – Low Birth Weight

LMICs – Low- and Middle-income Countries

MCH – Maternal and Child Health

Disclaimer (Artificial intelligence)

Option 1:

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

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Details of the AI usage are given below:

1. No generative AI technologies were used in this study.

2.

3.

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