

Antenatal Depression as a Stunting Risk Factor: A Systematic Review

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Abstract

BACKGROUND: Depression during pregnancy is underestimated even though depression hurts the mother and the fetus to adulthood. Stunting is a problem of lack of nutritional status that begins during pregnancy.

AIM: The purpose of this article is to systematically identify the description and relationship between depression during pregnancy and stunting in children.

METHODS: The approach used is the systematic review method to search articles. The method used is reporting the findings using a choice guide for systematic reviews and meta-reviews analyses (PRISMA) 2020 and a flowchart. Articles were identified from 2010–2020 by conducting a literature search with the keywords “antenatal depression” OR “prenatal depression” OR “depression during pregnancy” and “stunting” in the electronic databases dataset by Sciedirect Proquest, Google Scholar, EBSCOhost.

RESULTS: The search results found 1.446 articles selected into 20 journal articles that match the inclusion criteria.

CONCLUSION: The results found that depression during pregnancy correlated with risk factors for stunting. Health workers, especially midwives, can provide psychological care in antenatal care by considering preventive measures.

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Introduction

Stunting is a problem of lack of nutritional status that begins during pregnancy. Stunting in infants under five years (toddlers) in the world based on 2017 data of 22.2% or around 150.8 million children under five [1]. Stunting can be prevented at an early age life is during pregnancy. Risk factors for stunting in pregnancy are a lack of nutrition and infections [2]. The psychological health of pregnant women will also affect the health of the developing fetus conceived. Based on research results, the results showed that depression in mothers will affect the health of the fetus risk of low birth weight babies (LBW) and will experience stunting later in life [3]. Depression during pregnancy is of particular concern because depression in the mother can paralyze the good function mother during pregnancy until the next life [4].

Depression during pregnancy is poorly understood by some pregnant women, especially in low-income countries and medium. It is possible because maternal health prioritizes maternal death, not morbidity for pregnant women [5]. Depression during

pregnancy can be caused by several factors, namely individual vulnerability to stress, experience events stressful life like pregnancy, and history of depression before [6].

Depression during pregnancy can cause LBW, a marker of poor fetal growth that causes stunting in childhood and predisposes to health problems in adulthood [7]. Maternal depression symptoms negatively impact the health of the mother, fetus, child, and family. Maternal depression has an impact, namely antenatal care (ANC), which does not awake, use of drugs that poor nutrition, inadequate nutrition, preeclampsia, postpartum depression, suicide self, and interference in work or difficulty to work, thus disrupting economics [8], [9], [10].

Process about depression during pregnancy which causes premature birth, and LBW is still not clearly understood. The relationship between depression during vulnerable LBW pregnancies experiencing stunting in some research still does not show consistency whether related or not related. Still, the study results show that anxiety and stress are mediators of prematurity, whereas depression is a mediator of LBW [10]. The purpose of this article

is to systematically identify the description and relationship between depression during pregnancy and stunting in children in the world grouped by continent and country so that it can be used as a reference in implementing preventive interventions stunting by preventing, reducing, and treating depression during pregnancy.

are used: (“antenatal depression” OR “prenatal depression” OR “depression during pregnancy” and “stunting”). The second step is article selection by limiting the articles that include research articles, articles that have been reviewed, and articles that can be openly accessed. In the third stage, the selection is based on an abstract for writing. Namely, depression during pregnancy impacts the incidence of stunting in children in future.

Methods

The method used is reporting the findings using a choice guide for systematic reviews and meta-reviews analyzes (PRISMA) and using a flowchart, namely by eliminating articles that are not relevant to the criteria inclusion, screening, eligibility, and final download of relevant articles [11]. In this article, inclusion criteria was determined to facilitate data collection. Inclusion criteria of this article are: (a) Study using language English, (b) journal articles from 2010-2020, (c) research articles or articles which have been reviewed, (d) articles openly accessible journal, (e) articles related to maternal depression which discusses its relationship with stunting. In the next stage, the selection of articles will be carried out. Step first was selecting relevant articles in English identified from Scienedirect (n = 86), Proquest (n = 602), and Google Scholar (n = 532), EBSCOhost (n = 226) in 2010-2020 by doing a literature search in database electronics. The following search terms

PICOS

The population studied in this research is pregnant women or mothers and children. Intervention in this review found a relationship between depression during pregnancy with stunting. This review comparator has a relationship or not. The result of the review is that this prevents stunting in children by preventing or overcoming depression during pregnancy.

Design

The research chosen design by the author is a randomized controlled cohort and quasi-experimental. This research was conducted in three phases: search and collect literature and data by looking for strategies, selecting studies in journal databases online, and analyzing and evaluating literature. The remaining articles are checked in detail regarding the inclusion criteria. The article selection process is shown in Figure 1.

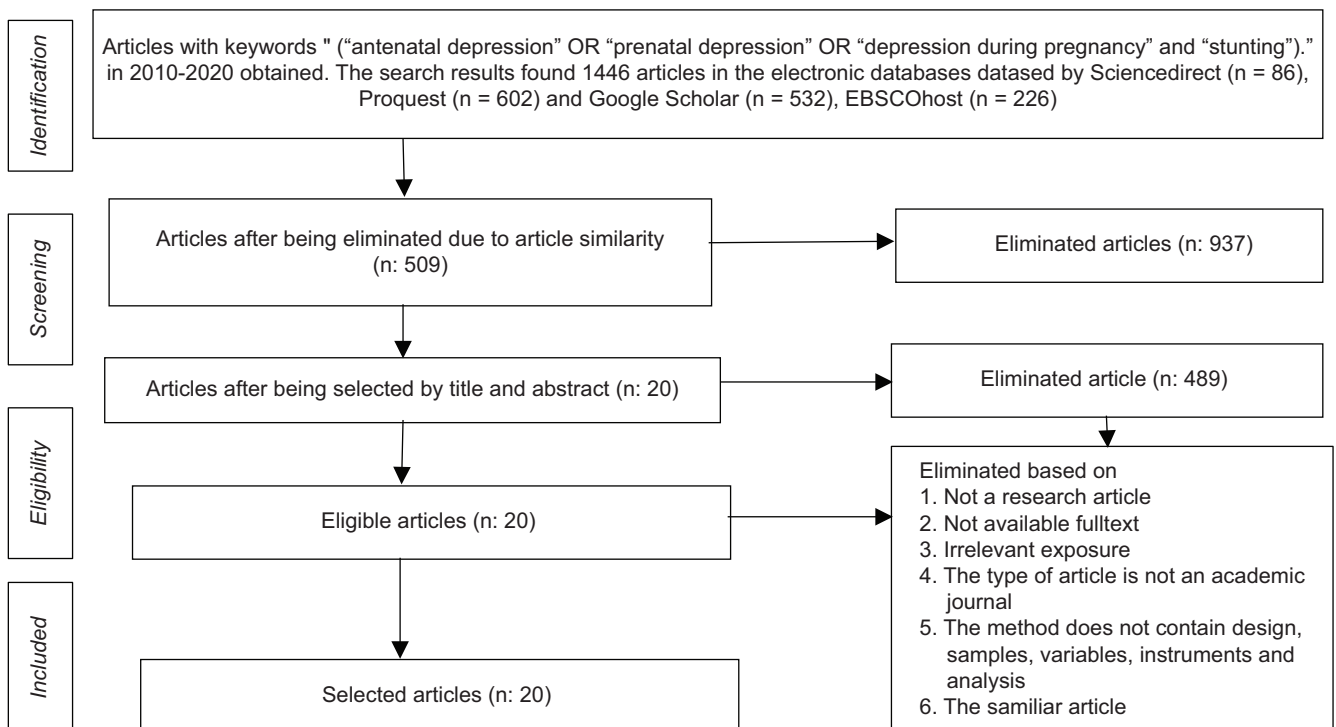


Figure 1: Article Selection Process

Results

The literature search found 1446 journal articles in electronic databases (Scencedirect, Pubmed Research Gate, and Google Scholar. The search results are then selected into 20 journal articles according to the criteria determined in Table 1.

Discussion

Depression during pregnancy was discussed and grouped according to the place of study. The journal search contained 17 research articles that said that depression during pregnancy to depression after delivery had a relationship with stunting in children. In comparison, three other articles said that depression during pregnancy to depression after childbirth had no relationship with stunting in children.

Pregnancy depression associated with stunting in Africa

Several studies conducted in African countries found a total of 7 articles where six articles said that depression in pregnant women had a relationship with the incidence of stunting and 1 article said it was not related, namely the study in Malawi using a randomized controlled trial method, the results of

antenatal depression were not associated with birth weight, gestational duration, newborn LAZ, or head circumference score [30].

The section below will explain that depression in pregnant women is associated with stunting. The results of a Tanzanian study using a prospective cohort study showed that 1128 mothers and children who participated in the study 12.8% of mothers experienced postpartum depression and the mean height adjusted for z-score (HAZ) was significantly lower at 2-3 years of follow-up for children of mothers with postpartum depression compared for children of mothers without depression, whereas there was no significant difference in body weight adjusted for age z-score [29].

The results of research in Ethiopia with the cross-sectional method results obtained from 232 mothers and babies who participated in the study show that maternal depression is associated with the incidence of stunting with a result of 30.6% stunted, 20.7% underweight and 7.8% wasted, where a third of mothers have a heavy workload, 22.8% have depressive symptoms based on EPDS score 13 as much as 22.8% [31].

The study results in Ghana using the cross-sectional method showed that the prevalence of stunting was 16.1% and depression in mothers was 27.8%. Depressed mothers tended to be younger at marriage, belonged to poorer households, and were more likely to have low birth weight babies. The results showed that children of depressed mothers were nearly three times more likely to be stunted than children of nondepressed mothers [23].

Table 1: Article summary of antenatal depression as a risk factor for stunting

| No | Author Name and Year | Country | Sample | Conclusion |
|----|---------------------------------|-----------------------------------|--|---|
| 1 | Ertel <i>et al.</i> , 2010 [12] | United States of America | 872 pregnant women and children | There is a minimal relationship between depression during pregnancy and the child's height. |
| 2 | Husain, 2012 [13] | British Pakistani | 191 pregnant women and children | Prenatal depression is not associated with impaired growth in children. |
| 3 | Traviss, 2012 [14] | Great Britain | 1716 pregnant women and children | Depression in pregnancy is associated with more infant growth low at 6 months |
| 4 | Guxens, 2013 [15] | The Netherlands | 5283 pregnant women | Psychological distress, including depression associated with early childhood growth and risk of overweight weight. |
| 5 | Nasreen, 2013 [16] | Bangladesh | 720 third trimester pregnant women | Symptoms of antepartum depression predict the occurrence of stunting in infants |
| 6 | Broekman, 2014 [17] | Singapore | 1153 pregnant women and children | Anxiety and depressive symptoms were not associated with birth weight, whereas anxiety and depressive symptoms were associated with length shorter birth. |
| 7 | Chang, 2014 [18] | South Korea | 151 pregnant women and children | Prenatal depression is not associated with low birth weight |
| 8 | Engelstad, 2014 [19] | United States of America | 238 pregnant women and children | Pregnant women with depression associated with premature birth. |
| 9 | Nguyen, 2014 [20] | Ethiopia, Vietnam, and Bangladesh | a. 2962 mother and child in Ethiopia b. 4010 mother and children in Vietnam c. 4400 mothers and children in Bangladesh | Mental disorders of pregnant women include depression related to stunting and child weight. |
| 10 | Yonkers, 2014 [21] | United States of America | 2654 pregnant women and children | Pregnant women with depression associated with premature birth. |
| 11 | Tomita, 2015 [22] | South Africa | 651 pregnant women and children | Depression before pregnancy that progresses to depression during pregnancy is associated with the incidence of low birth weight babies |
| 12 | Wemakor, 2016 [23] | Ghana | 384 pregnant woman | There is a high prevalence of depression in mothers with stunting in children. |
| 13 | Slemming, 2017 [24] | South Africa | 1098 mother and children | There is no relationship between maternal depression during pregnancy and stunting in children. |
| 14 | Babu, 2018 [25] | India | 654 pregnant women and children | Depression during pregnancy is associated with infant low birth weight |
| 15 | Nguyen, 2018 [26] | India | 2934 mother and children | Depression during pregnancy is significantly associated with child malnutrition and delay development |
| 16 | Rotheram-Fuller, 2018 [27] | United States of America | 1238 pregnant women and children | Depression during pregnancy is significantly associated with the physical growth of children who disturbed |
| 18 | Donald, 2019 [28] | South Africa | 734 mother and children | Antenatal depression is associated with poorer growth and developmental outcomes |
| 19 | Holm-Larsen, 2019 [29] | Tanzania | 1128 mother and children | Depressive symptoms during pregnancy and postpartum predict a linear decrease in height in children at 2–3 years of age, and a slight increase in body weight for height. |
| 20 | Stewart., 2019 [30] | Malawi | 1006 pregnant women and children | Antenatal depression was not associated with birth weight, gestational duration, newborn length, or head circumference. |
| 17 | Anato, 2020 [31] | Ethiopia | 232 mother and children | Depression during pregnancy has been associated with poor feeding and stunting |

A study in South Africa using the cohort method showed results from 1098 mothers and children that an increase in birth weight was associated with a reduced risk of stunting at the age of 2 years for both boys and girls [24]. Another study using the cohort method found that depressive symptoms before pregnancy that continued in pregnancy were associated with the incidence of LBW in infants [22]. Another study using the cohort method found that antenatal depression was associated with impaired growth and worse cognitive scores [22].

Pregnancy depression associated with stunting in Asia

Several studies conducted in Asian countries found six articles where five articles said that depression in pregnant women had a relationship with the incidence of stunting. One article said it was not related. A study in South Korea using the cohort method found that prenatal women who had depressed offspring were more likely to be low birth weight than prenatal women with no history of depression. Still, the association was attenuated when adjusted for gestational age [18]. The section below will explain that depression in pregnant women is associated with stunting.

The results of a study in Bangladesh using a quasi-experimental method were found in 720 pregnant women who had symptoms of pregnancy depression associated with stunting, with the result that 18.3% of pregnant women had a high EPDS score (≥ 10) [16]. The research results conducted in three countries, namely Bangladesh, Vietnam, and Ethiopia, showed that the prevalence of maternal mental disorders was high, ranging from 31% in Vietnam to 49% in Bangladesh. Malnutrition in children is more common in Bangladesh and Ethiopia than in Vietnam. Antenatal depression was associated with child stunting in Bangladesh, and with children underweight in Vietnam, no association was found with wasting [26].

A study in India using the clustered randomized controlled trial method showed mothers who experienced high depression during pregnancy. After delivery, they had the lower height for age, weight for age, weight z scores for weight, higher rates of stunting, and underweight and higher rates of developmental delay [26]. Another study in India using the cohort method was obtained from 654 pregnant women; 16.5% of mothers experienced depression. Depressed mothers gave birth to children with low birth weight twice as high for women with an EPDS score >11 compared to women with an EPDS score of 11, and this category has also been shown to be a risk factor for low birth weight [25].

The results of the Singapore study using the cohort method showed a significant negative relationship between symptoms of depression and anxiety recorded at 26 weeks of gestation and birth

length after controlling for several potential confounders. Depression during pregnancy was not associated with birth weight or head circumference but significantly affected birth length [17].

Pregnancy depression linked to stunting in Europe

Several studies conducted in European countries found three articles where two articles said that depression in pregnant women had a relationship with the incidence of stunting. One article said it was not related. Using the cohort method, a study in England showed no difference in weight, birth weight, and height at 6 months of depressed mothers compared to infants of psychologically healthy mothers. The only significant difference between the two groups was the infant's adaptive behavior; Babies of depressed mothers score significantly lower than those of psychologically good mothers [13].

A study in the Netherlands showed that overall maternal psychological symptoms, depression, and anxiety were negatively related to body length at 3 months and height at 4 years of age. In addition, overall maternal psychological symptoms, depression, anxiety, and hostility were positively related to children's BMI at 3 months and 6 months of age [15]. A British study using a cohort method found that depression during pregnancy was associated with lower infant growth at 6 months. Group A pregnant women reported higher rates of depression during pregnancy associated with smaller babies at birth than group B [14].

Pregnancy depression linked to stunting in America

Several studies conducted in the United States found four articles that said that depression in pregnant women had a relationship with the incidence of stunting. Yonkers *et al.* (2014) research using the cohort method showed that the risk of preterm birth increased by 1% to 2% [21]. The chances of premature birth are high for stressed and depressed mothers who take benzodiazepine drugs. Engelstad's (2014) study using the cohort method showed that pregnant women with depression experienced increased alcohol and tobacco use and the rate of premature birth [19].

Ertel's (2010) research using the cohort method showed that 8.0% of mothers experienced antenatal depression, and 7.3% experienced postpartum depression [12]. The average height (SD) for children aged 3 years is 97.2 cm, with a foot length of 41.6 cm. The association between postpartum depression and height based on a greater mean was seen starting at 6 months and continuing until 3 years of age. There was a minimal association between antenatal depression and child height outcomes. Another study from Rotheram-Fuller *et al.* (2018) using the cohort

method found that children of mothers who had never experienced depression had a higher weight-for-age z-score than children of mothers with antenatal or postnatal depression. [27].

Relationship between depression during pregnancy and stunting

The main causes of stunting, namely malnutrition, and infection, are associated with disturbed psychosocial conditions, including depression that begins in utero and manifests at the age of 2–3 years [32]. The average prevalence of depression during pregnancy is in low-income countries, which are estimated at 25.3% and in middle-income countries, 19.6% [8].

It is by the article that most of them are in low-middle-income countries. Women's poor socioeconomic status affects fetal growth and pregnancy outcomes. It adversely affects behavioral practices related to proper self and child care, contributing to low body mass index (BMI) in mothers and stunting in children [33].

Depression during pregnancy is not associated with premature birth or babies with low birth weight and length, risk factors for stunting. The article discusses that depression during pregnancy is not only a factor that causes growth disorders in infants but also other factors influence such as maternal factors and environmental factors [13], [18], [24]. Maternal factors that are at risk of causing stunting in children, namely maternal stunting (mother's height <145 cm), can increase the risk of premature birth in infants [34], and maternal weight before pregnancy is the strongest indicator predicting the size of the baby's birth [35].

Depression during pregnancy will affect fetal growth, and if depression continues, it will affect the growth and development of children, which will cause stunting [36]. Maternal depression can affect child outcomes early in pregnancy (through altered placental function, epigenetic changes, and stress reactivity). Depression during pregnancy can also affect the health of pregnant women, which affects the health of the fetus through inadequate nutrition, poor personal and environmental hygiene, which can lead to infection, and poor health-seeking practices [37]. Depression during pregnancy has the risk of causing the baby to be born prematurely, with low birth weight, and the baby to have a short body length. Babies born prematurely, with low birth weight and length, based on research results, will be more frequent or tend to remain small in childhood. Depression during pregnancy, if it continues until delivery, will cause depression after delivery which will cause problems in infancy and childhood through disturbed mother–child interaction, lack of affection, and lack of responsiveness [37].

There is sufficient evidence to support the fact that stunting begins in utero, and newborn size is a

strong predictor of height at 12 months [40]. Stunting caused by LBW is the highest in the first 6 months and will worsen with age [38]. LBW is associated with a 2.5–3.5 times higher chance of stunting in children [39].

Conclusion

Depression during pregnancy is often found and ignored, even though depression hurts the mother and the fetus to adulthood. Depression during pregnancy will affect fetal growth, and continued depression will affect the growth and development of children, leading to stunting. Based on the results of a literature search, it was found that depression during pregnancy had a relationship with risk factors for stunting and as a curative or rehabilitative effort in treating pregnant women with depression by providing social support to pregnant women during the pregnancy process.

Health workers, especially midwives, can provide psychological care in antenatal care by considering preventive measures. This article can provide an overview of depression during pregnancy related to stunting. It can be used as the basis for promotive or preventive interventions for pregnant women in preventing stunting in children. This article can also be used as a basis for further research related to stunting prevention during pregnancy, namely by preventing or overcoming depression during pregnancy due to the increasing number of pregnancies and depression during pregnancy during the COVID-19 pandemic.

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