

THE OUTCOMES OF EATING DISORDER BEHAVIOR DURING PREGNANCY

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REVIEW

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ABSTRACT

Introduction – Eating disorder behavior is a serious mental illness, that is indicated by a person's eating behavior. The eating disorder has several types including anorexia nervosa, bulimia nervosa, binge eating disorder, and eating disorder not otherwise specified. Eating disorders not only occur in adolescents but can also occur in pregnant women. Eating disorders that occur during pregnancy will affect her pregnancy.

Methods – The method used is a literature review. From 117 articles, 5 articles were obtained to be analyzed. Articles used for the period 2018-2023. Journal articles, published on PubMed, Europepmc, Frontiers, Wiley Online Library, and Google Scholar. Articles are analyzed by looking at, the author, year, and title, researcher goals, design, and results.

Results – Eating Disorder during pregnancy is fatal to the outcome of pregnancy. Small for gestational age is more common in mothers with anorexia nervosa. Large for gestational age is more common in mothers with binge eating disorder and bulimia nervosa. The supporting factors that cause eating disorders are the most important are smoking and symptoms of depression and anxiety.

Discuss – Pregnant women with eating disorders (AN, BN, BED, and EDNOS) are caused by several strong factors that influence these behaviors, one of which is smoking before and during pregnancy and symptoms of anxiety and depression.

Conclusion – Eating disorders in pregnancy produce a large impact on pregnancy outcomes, especially in the fetus, such as LGA, LBW, IUGR, and SGA. The impact that occurs by the fetus can also have an impact until adulthood. Therefore, mothers should be more aware of eating disorder behavior during pregnancy.

Keywords: eating disorder, pregnancy, infant.

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INTRODUCTION

Pregnancy is a condition that involves intense psychological and biological changes. So that it can affect a perception of body shape and diet.¹ In addition, during pregnancy, there are changes in adaptive neuroendocrine that can interfere with brain function, metabolism, mood, and appetite.² Along with the times, there are so many who promote a slim body shape, this makes concern about weight changes so that people have a sense of dissatisfaction with weight changes in themselves. This perception can cause pregnant women to feel stressed and anxious over changes in body shape that occur during pregnancy, resulting in more dysfunctional dietary changes.³

According to the National Institute of Mental Health, eating disorders are serious mental illnesses and are characterized by a person's eating behavior. Patients with eating disorders can affect a person's physical and psychosocial health. This is due to the growing concern about changes in body shape that are

not what they want, so a person chooses to change irregular and unhealthy eating behaviors, such as limiting eating, fasting, or regurgitating the food they have eaten.^{4,5}

Population-based cohort studies between 2003 and 2014 explained that of 1,236,777 births, women who met the criteria for bulimia nervosa were 0.1% (1,378), anorexia nervosa 0.2% (2,769), and 0.3% (3395).⁶ four types of eating disorders occur during pregnancy, the first is anorexia nervosa (AN), a very serious mental illness, characterized by sufferers who limit eating intake (energy) causing very low body weight and accompanied by fear of weight gain. The second is bulimia nervosa (BN) is one of the mental illnesses characterized by vomiting the food he has eaten, this has been done repeatedly for the last 3 months and occurred 2x a week.^{7,8} Third is binge eating disorder (BED) where patients with this eating disorder have eating behavior that is eating in very large or excessive amounts and do not have the feeling to stop eating. This

happens for 3 months, at least once a week.^{9,10} Last but not least is Eating Disorder Not Otherwise Specified (EDNOS).¹¹

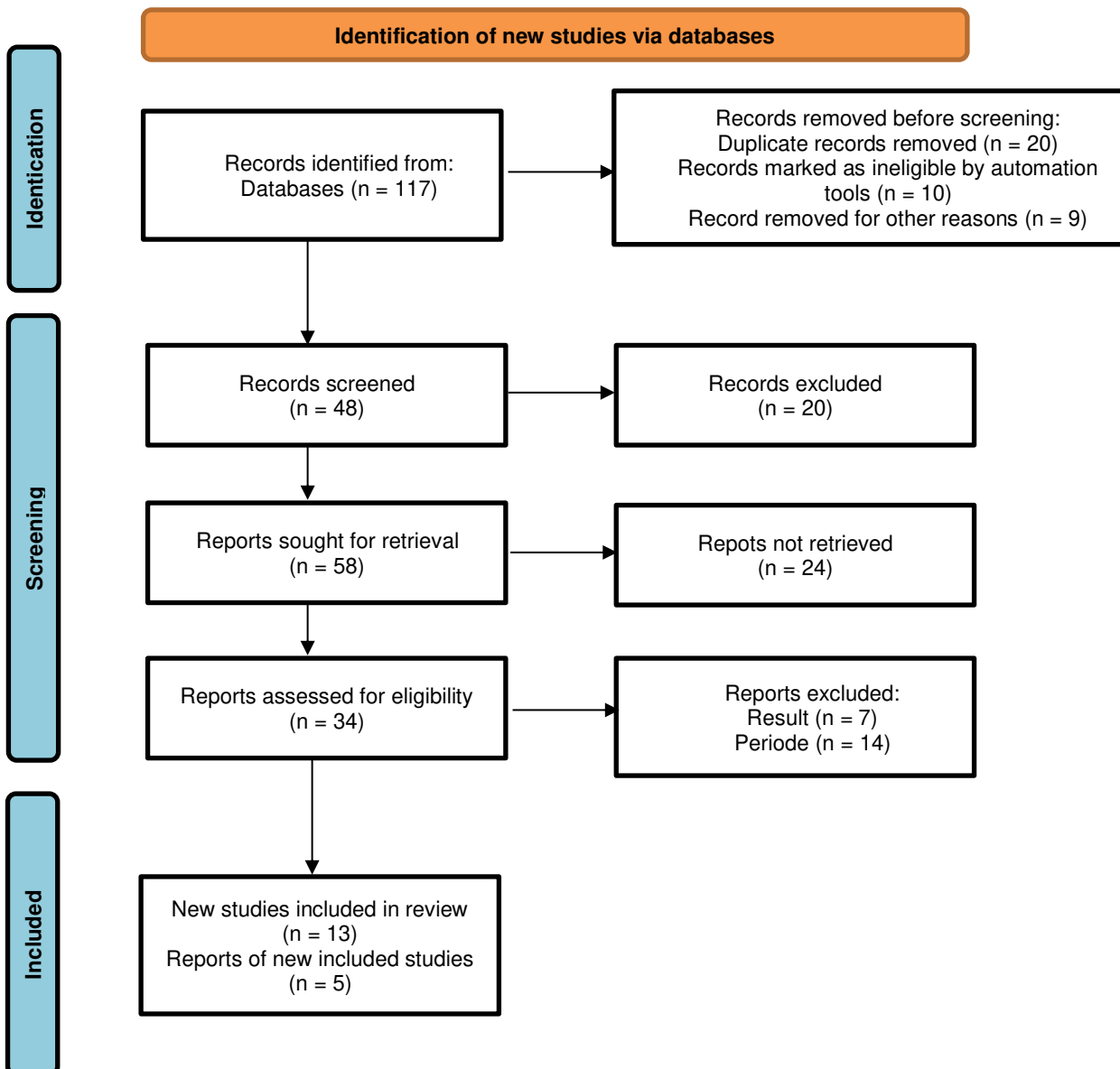
Maternal nutrition that is not fulfilled during pregnancy will hurt both the mother and her baby. Malnourished mothers will have low body weight during pregnancy which will cause malnutrition, low blood pressure, weakness, and fainting. The effects on babies who do not have enough nutrition to eat will experience growth at a certain rate that is not expected and can increase the risk of miscarriage, premature birth, low birth weight delays, and long-term developmental problems.¹²

This study aims to review research articles related to the relationship between eating disorder behavior during pregnancy and the impact that occurs on pregnancy outcomes. In addition, this article is an update on research on eating disorder behavior in pregnancy.

This study has two criteria used to sort out the data sequencers, namely by using inclusion and exclusion criteria: Inclusion criteria: Research relating to factors influencing eating disorder behavior during pregnancy and the impact of such behavior on pregnancy outcomes, published in 5 years i.e. from 2018-2023. Exclusion criteria: research that is not written in English, research using rat experimental animals, and in the form of guidelines.

Journal data used are international journal articles published on PubMed, Europepmc, Frontiers, Wiley Online Library, and Google Scholar. Using the selected keywords are: "anorexia nervosa", "pregnancy", "eating disorder", "binge eating disorder", "bulimia nervosa" "impact on the fetus", and "EDNOS". 5 articles were used. The results of the article selection are depicted in the Flow Chart in the figure.

METHOD



In this study, we are using the literature review method or library research. This research examines the ideas contained in an article on a particular topic.

RESULT

The five studies analyzed in the form of a literature review have met the inclusion criteria by the predetermined topics. Elik-Nes et al. (2018) stated that eating disorders experienced

during pregnancy occur due to several factors, namely, mothers who have a history of smoking during pregnancy in AN (n = 157), BN (n = 121) and EDNOS and sub-threshold ED (n = 43). Judging from the results that have been described in the table. 1 History of AN, EDNOS, and sub-threshold ED in model 3 are factors of birth year, marital status, and parity. While the history of BN, EDNOS, and sub-threshold in model 2 is the maternal age factor.¹³

Chan et al. (2019) stated that eating disorders in pregnant women occur due to several risk factors, namely, the results of univariate regression show eating disorders before pregnancy are significantly ($P < 0.0001$) associated with eating disorders in the T1-T3 group. Smoking before pregnancy significantly ($p < 0.01$) could lead to eating disorders in the T3 group. In the T1-T3 group, depressive symptoms and mother with anxiety were independently and significantly associated with the occurrence of ED in TM1-TM3 (all groups $p < 0.0001$, except

with the T1 group i.e. association between depressive symptoms and eating disorders, $p < 0.05$).¹⁴

Mantel et al, (2020) that mothers with ED during pregnancy can be caused by several factors, which are seen from maternal history data, namely mothers with smoking, and previously owned comorbidities such as anxiety disorders, type 1 and 2 diabetes, significantly occur in mothers who have eating disorders.⁶

Sebastiani et al, (2020) explained that pregnant women with ED can be associated with psychological factors in mothers, namely, mothers who experience anxiety and depression. This is found in the history data of pregnant women who experience ED.²

Janas-Kozik et al, (2021) concluded that the factors of eating disorders in pregnant women are the presence of comorbid diseases depression, anxiety, and borderline personality disorder.¹⁵

Table 1. Impact of Eating Disorders on Pregnant Women

No	Author, Tahun dan Judul	Tujuan	Desain	Hasil
1.	Eik-Nes et al., 2018 ¹³ Impact of eating disorders on obstetric outcomes in a large clinical sample: A comparison with the HUNT study	Identify associations between lifetime eating disorder and pregnancy outcomes	Patient Registration Data and HUNT Study	Pregnant women with a history of AN have a chance of giving birth to babies with SGA in model 3 (OR 2.7, 95% CI 1.4-5.1). BNs with model 2 have a chance of giving birth to LGA (OR 1.0, 91% CI 0.6-1.6). EDNOS and sub-threshold ED models 2 and 3 have a chance of delivering babies with 5-minute APGAR (OR 3.2, 91% CL 1.1-8.8) (OR 3.2, 91% CL 1.1-8.9).
2.	Chan et al., 2019 ¹⁴ Course, risk factors, and adverse outcomes of disordered eating in pregnancy	Suppressing eating disorder behavior during pregnancy and the postpartum period	Prospective longitudinal design	Abnormal birth weight, Large for gestational age. The results of conception that occur in pregnancy with mothers who have eating disorders, it will have an impact on the growth and development of children.
3.	Mantel et al., 2020 ⁶ Association of Maternal Eating Disorders with Pregnancy and Neonatal Outcomes	Investigate the relative risk in women with eating disorders to pregnancy and adverse neonatal outcomes.	Population based cohort study	Increases the risk of premature birth in 60% of AN women (RR, 1.6) and 70% of very premature births in women with EDNOS (RR, 1.7). The risk of having an SGA baby is highest in women with anorexia nervosa (RR, 1.4). Women with AN have a 2-fold risk, 60% of bulimia nervosa and 40% of EDNOS of having neonates with macrocephaly (RR, 1.9; RR, 1.6; and RR, 1.4). APGAR scores below 7 occur in women with EDNOS (RR, 1.4).
4.	Sebastian et al., 2020 ² Eating Disorders During Gestation: Implications for Mother's Health, Fetal Outcomes, and Epigenetic Changes	Increase awareness of ED during pregnancy accompanied by dietary patterns that can have an impact on the fetus	A systematic review	Mothers who have ED during pregnancy are at increased risk for neonates including SGA, IUGR, LGA (BED subtype), microcephaly and intraventricular hemorrhage, and perinatal death.
5.	Janas-Kozik et al., ¹⁵ Systematic Review of Literature on Eating Disorders During Pregnancy-Risk and Consequences for Mother and Child	Review changes in a woman's body shape during pregnancy and update knowledge about ED	A systematic review	Mothers with AN are more likely to give birth to babies with shorter birth length, SGA, low birth weight, and IUGR. Mothers with BN will be more likely to deliver a baby i.e. low APGAR score at 1 minute. Mothers with BED will be more likely to give birth to LGA and have longer birth lengths.

DISCUSS

Eating disorder behavior is a mental health problem that must be prevented, this is because it hurts pregnancy outcomes, which was previously described in Table 1. Eating disorders themselves are caused by several factors, one of which is the most dominant is a history of smoking.^{2,13,14} Many women before pregnancy even during pregnancy smoke, this is because of their mindset that want to control weight without having to eat. Smoking has nicotine content that can suppress hunger or appetite. So they make cigarettes an alternative way to it.¹⁶ Smoking can be associated with type 2 diabetes mellitus, where smoking can lead to inadequate compensatory insulin secretion or insulin resistance through various effects such as oxidative stress, endothelial dysfunction, and inflammation.¹⁷

Symptoms of depression and anxiety indicate an association with ED in pregnant women. Reinforced by research conducted by Santos et al. (2017) which found that there was a significant relationship ($p < 0.01$) between the risk of depressive symptoms and anxiety in pregnant with ED. Researchers suspect that pregnant women with ED are more concerned about self-esteem and body shape.¹⁸ Both factors have strengthened a relationship with ED during pregnancy. Of these two factors, it has been confirmed that it will affect the outcome of pregnancy.

Small for Gestational Age is more common in pregnant with AN.^{6,13,15} Reinforced by research conducted by Ante et al. (2020) states that mothers with AN are 1.52 times at risk of

SGA (95% CI 1.35-1.72).¹⁹ Mothers with SGA babies have significantly lower average intakes of zinc, energy, calcium, iron, vitamin D, and protein, while the nutrient intake is essential for the baby's growth.²⁰ Infants with SGA generally have insufficient nutritional intake in postpartum, this is because the nutrients obtained in the womb are not fulfilled they experience poor feeding tolerance, immature development of digestive function, the presence of other diseases after birth (neonatal asphyxia, neonatal hyperbilirubinemia, and hypoglycemia) and will be difficult to catch up with growth.²¹

Low Birth Weight occurs in pregnant women with AN.¹⁵ Reinforced research conducted by Ante et al. (2020) states that mothers with AN are 1.69 times at risk of giving birth to LBW babies.¹⁹ Infants with LBW were 1.74 times more likely to be stunted.²² LBW can have an impact on childhood that can affect IQ, which has a high potential to have a lower IQ.²³

Intrauterine Growth Restriction occurs in pregnant women with AN.¹⁵ Reinforced by the results of research by Babatseva et al. (2020) using the case report method states that severe AN in pregnant women can cause IUGR.²⁴ IUGR infants may be a risk factor for delay in neurocognitive development.²⁵

Large Gestational Age occurs in mothers with BED and BN.^{2,13-15} Reinforced by research conducted by Waston et al. (2018) found that pregnant with BED have a 19% higher risk of experiencing LGA (1.19; 1.14, 1.26).²⁶ Babies born with LGA have a higher risk of obesity in adolescence and young adulthood, in addition to increasing the risk of developing metabolic syndrome later in life.²⁷

CONCLUSION

Pregnant women with eating disorders (AN, BN, BED, and EDNOS) are caused by several strong factors that influence these behaviors, one of which is smoking before and during pregnancy and symptoms of anxiety and depression. Eating disorders in pregnancy produce a large impact on pregnancy outcomes, especially in the fetus, such as LGA, LBW, IUGR and SGA. The impact that occurs by the fetus can also have an impact until adulthood. Therefore, mothers should be more aware of eating disorder behavior during pregnancy.

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