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THE IMPACT OF DEPRESSION SYMTOMS ON MATERNAL INCREASING THE INCIDENCE OF LOW BIRTH WEIGHT (LBW) BABIES

Dampak Depression Symptoms pada Maternal Meningkatkan Kejadian Bayi Berat Lahir Rendah (BBLR)

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ABSTRAK

Kesehatan mental ibu merupakan masalah kesehatan masyarakat yang penting, di mana sekitar 10% ibu hamil mengalami gangguan mental, terutama depresi. Depresi selama kehamilan berdampak negatif terhadap hasil persalinan, termasuk meningkatkan risiko Bayi Berat Lahir Rendah (BBLR). Tujuan penelitian ini yaitu diketahuinya dampak depression symptoms pada maternal terhadap peningkatan kejadian BBLR di Kabupaten Karawang tahun 2023. Penelitian ini merupakan studi analitik dengan pendekatan retrospektif, menggunakan kuesioner, pengukuran depresi dengan Edinburgh Postnatal Depression Scale (EPDS). Populasi penelitian adalah ibu bersalin, sebanyak 21 responden pada kelompok kasus (BBLR) dan 63 responden pada kelompok kontrol (non-BBLR). Teknik pengambilan sampel menggunakan non-probability sampling dengan metode consecutive sampling. Analisis data menggunakan uji chi-square, perhitungan odds ratio (OR), dan confidence interval (CI) 95% dengan tingkat signifikansi p < 0,05. Hasil penelitian menunjukkan bahwa 22,6% responden mengalami gejala depresi, dengan proporsi lebih tinggi pada kelompok kasus (57,1%) dibandingkan kontrol (11,1%). Gejala depresi selama kehamilan berhubungan signifikan dengan kejadian BBLR (p = 0,0001; OR = 10,66), artinya ibu dengan gejala depresi memiliki risiko 10,66 kali lebih besar melahirkan bayi BBLR. Disarankan untuk memperkuat konseling dan edukasi bagi ibu hamil dan pasangan pranikah terkait kesehatan reproduksi dan faktor risiko BBLR.

Kata kunci: *Bayi Berat Badan Rendah (BBLR), depression symptoms, Edinburgh Postnatal Depression Scale (EPDS)*

ABSTRACT

Maternal mental health is a critical public health concern, with around 10% of pregnant women experiencing mental disorders, particularly depression. Depression during pregnancy can negatively impact birth outcomes, including increasing the risk of Low Birth Weight (LBW). The purpose of this study was to determine the impact of maternal depression symptoms on the increase in the incidence of LBW in Karawang Regency in 2023. The research used an analytical retrospective design with data collected through questionnaires and the Edinburgh Postnatal Depression Scale (EPDS). The study population consisted of postpartum mothers, with 21 respondents in the LBW case group and 63 in the non-LBW control group. Sampling was conducted using a non-probability consecutive sampling method. Data were analyzed using the chi-square test, odds ratio (OR), and 95% confidence interval (CI), with a significance level of p < 0.05. Results showed that 22.6% of respondents experienced depressive symptoms, which were more prevalent in the case group (57.1%) than in the control group (11.1%). Depression during pregnancy was significantly associated with LBW (p = 0.0001; OR = 10.66), indicating that mothers with depressive symptoms had a 10.66 times higher risk of giving birth to

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LBW infants. It is recommended to strengthen counseling and education for pregnant and premarital women on reproductive health and LBW risk factors.

Keywords: Low Weight Baby (LBW), depression symptoms, Edinburgh Postnatal Depression Scale (EPDS)

INTRODUCTION

According to the World Health Organization (WHO), depression is one of the main factors contributing to the increase in disability-adjusted life years lost in women worldwide.[1] Depression during pregnancy is quite common, with as many as 30% of pregnant women experiencing significant symptoms of depression.[2] Based on a systematic review of 28 observational studies (including cross-sectional, cohort, and case-control studies), the estimated prevalence of major depression in pregnancy is 3.1–4.9% and minor depression is 11% in high-income countries.[3] Whereas in low and middle-income countries, the incidence of mild or severe depression is more severe.[4] The reported prevalence of depression in pregnancy in China varies between 3.80% and 35.9% due to different screening tools.[5, 6, 7]

Pregnancy depression is a psychological disorder with symptoms of prolonged sadness, hopelessness, loss of interest in everything, fatigue, problematic sleeping and eating patterns, irritability, and an inability to feel happiness in daily life.[8] Evidence reports that this condition has a negative impact on the mother and fetus, namely the occurrence of pregnancy complications, Intrauterine growth restriction*(*IUGR), premature birth, postpartum hemorrhage, preeclampsia, low birth weight (LBW), and developmental disorders. Pregnancy depression is also closely linked to postpartum depression, thus impacting maternal quality of life and becoming a major cause of disease burden in both developed and developing countries.[9] Pregnant women with symptoms of antenatal depression have a higher risk of giving birth to babies with low birth weight.[10]

Pregnancy-related depression not only damages the physical and mental health of the pregnant women, but also has a significant impact on the future psychological and intellectual development of the fetus.[6,7] Several studies have evaluated the impact of depressive symptoms on LBW, which is associated with an increased risk of infant mortality and morbidity.[11]

Antenatal depression is a condition in which a pregnant woman experiences feelings of depression, loss of interest, and reduced energy, leading to reduced activity for more than two weeks. Other symptoms include a lack of interest in the pregnancy, suicidal thoughts, and anhedonism.a condition where a person cannot feel pleasure or joy. The incidence of depression in pregnant women, according to research in Indonesia, is between 20 and 25%.[12]

Hapsari's research demonstrated that depressive symptoms were more common in pregnant women who delivered low-birth-weight babies (LBW) compared to those who delivered babies weighing more than 2,500 grams. There is a correlation between maternal depressive symptoms and the incidence of LBW.[13]. The results of other studies show that women who experience depression during pregnancy have a higher risk of giving birth to babies with low birth weight (AOR = 1.4, 95% CI: 1.1–1.7).[10]

The impact of untreated depression on pregnant women is a tendency to have poorer nutrition, neglect their pregnancy, be less compliant with prenatal checkups, and not recognize the signs of labor. Meanwhile, the impact of antenatal depression on the fetus can be seen in birth outcomes. The WHO states that children born to mothers with depression will be negatively affected in their development.[14] Mothers who

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experience antenatal depression have a greater chance of giving birth to low birth weight (LBW) babies, premature birth, lower APGAR scores, and smaller head circumference.[15] Adverse birth outcomes have been reported as a result of antenatal depression. One study identified preterm birth and low birth weight as the main outcomes found.[16] Antenatal depression increases the risk of premature birth and low birth weight (LBW).[17] Research in the United States by Szegda found an increased risk of Small-for-gestational-age (SGA) babies in pregnant women who experienced depression.[18]

Perinatal depression is often missed because signs and symptoms, including acute and chronic stress, sleep deprivation, and hormonal changes, are experienced by every pregnant woman.[19] Mental health disorders that often occur during pregnancy and are considered normal, but become serious and lead to self-harm and suicide.[20]

Risk factors for depression during pregnancy include lack of social support, living alone, marital discord, unwanted pregnancy, having multiple children, and teenage pregnancy. Furthermore, a personal or family history of depression is also a predisposing factor.[15,21]

Based on preliminary studies, it was found that 2 out of 8 pregnant women experienced depression symptoms; therefore, researchers were interested in conducting a study entitled The Impact of Depression Symptoms on Maternal Increases the Incidence of Low Birth Weight (LBW) in 2023.

METHODS

The study was conducted in 2023, from April to September, and this type of research is an analytical study with a retrospective approach in the Karawang Regency area. The population in this study were mothers who gave birth who met the inclusion criteria, which were divided into two groups, namely as cases were postpartum mothers who gave birth to LBW, including preterm, IUGR/Small for Gestational Age, and controls were postpartum mothers who gave birth to babies with normal weight (≥2500 grams). The sampling technique was non-probability sampling with the consecutive sampling method, with a calculation of a sample size of 21 cases and 63 controls (1:3), so that the total sample size was 84 people.

The research instrument for assessing depressive symptoms in pregnant women uses the Edinburgh Postnatal Scale (EPDS). The EPDS is a widely used measurement tool for detecting depression during pregnancy and postpartum and was specifically developed to assess depression based on affective symptoms that exclude somatic symptoms (physical abnormalities).[22],[23] This instrument consists of 10 questions that respondents will complete regarding their feelings over the past seven days. The EPDS results will be calculated and scored. Respondents will also fill in some required data in a questionnaire provided by the researcher.

The variables to be studied: age, parity, education, occupation, history of LBW, physical problems, psychological problems, history of LBW, history of prematurity. The analysis carried out was univariable, bivariable analysis using chi-square, calculation of odds ratio (OR) with Confidence interval (CI) 95% and significance level P = 0.05. The ethical approval letter, approved by the ethics team, is number: 45 / KEPK / EC / VI / 2023.

RESULT

Based on Table 1, the majority of respondents were within the healthy reproductive age range (64.3%), had a higher level of education (51.2%), and were not employed (78.6%). Most respondents were multiparous (65.5%), did not experience psychological problems during pregnancy (93.7%), and had no history of low birth weight or preterm birth (84.5%).

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Table 1. Distribution of Respondent Characteristics

Variables	Case Group		Control Group		N	%
	n	%	n	%		
Age						
Unhealthy reproductive age	6	28.6	24	38.1	30	35.7
Healthy reproductive age	15	71.4	39	61.9	54	64.3
Education						
Low	14	66.7	27	42.9	41	48.8
High	7	33.3	36	57.1	43	51.2
Work						
Unemployed	18	85.7	48	76.2	66	78.6
Employed	3	14.3	15	23.8	18	21.4
Parity						
Nullipara	4	19.0	25	39.7	29	34.5
Multipara	17	81.0	38	60.3	55	65.5
Physical problems						
Yes	14	66.7	23	36.5	37	44.0
No	7	33.3	40	63.5	47	56.0
Total	21	100	83	100	84	100

Table 2. Relationship between Depression Symptoms and the Incidence of Low Birth Weight (LBW) in Karawang Regency in 2023

Variables	Case (%)	Control (%)	Total	*p-value*	OR (CI 95%)
Depression Symptoms					
Yes	12 (57.1)	7(11.1)	19(22.6)	0.0001	10.66
No	9 (42.9)	55(88.9)	65(77.4)		
Total	21 (100)	63(100)	84(100)		

Based on Table 2, the majority (57.1%) experienced depression symptoms in the case group, while in the control group, 11.1%. A p-value of 0.0001 was obtained, which means there is a significant relationship between depression symptoms during pregnancy and the incidence of low birth weight (LBW). With an OR value of 10.66, this means that mothers who experience depression symptoms during pregnancy have a 10.66 times greater chance of low birth weight in their babies compared to mothers who do not experience depression symptoms.

DISCUSSION

Respondent Characteristics

Depression was more likely to occur among pregnant women of healthy reproductive age (20–35 years), with 71.4% in the case group and 61.9% in the control group. This finding is in line with previous studies indicating that most pregnant women experiencing depressive symptoms are within the healthy reproductive age range (20–35 years). Nevertheless, the prevalence of antenatal depression remains considerably high among women of unhealthy reproductive age (<20 or >35 years).[24] The ideal reproductive period for women to conceive and give birth is between the ages of 20 and 35, during which the reproductive organs are fully developed and accompanied by emotional and social maturity, as well as the capacity to care for the newborn. This stage of reproductive health contributes to better physical and psychological preparedness, allowing mothers to manage challenges with emotional stability.[25]

According to Howard reproductive age Which unhealthy at risk of depression.[26] Li et al.'s study reported

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that women under 25 years of age were more likely to suffer from antenatal depression than women over 25 years of age.[10] Other research reports that women under 20 are at increased risk of maternal depression. This is due to a lack of readiness to have children, anxiety about their ability to care for their babies, and the risks mothers may experience during pregnancy, childbirth, and the postpartum period.[27] In addition, complications in teenage pregnancies (<20 years) are higher than in the healthy reproductive period of 20-35 years, thus harming the mother's health and the baby's growth and development.[27] Maternal age as a predictor of prenatal depression. According to a study conducted by Getinet, one factor, namely the mother's age during pregnancy, is related to prenatal depression.[28]

In the case group, 66.6% of respondents were found to have lower levels of education, while in the control group, 57.1% were found to have higher levels of education. Depression was more common among mothers with lower levels of education.[29] Maternal education is related to low birth weight (LBW) births. A person's level of education will increase their awareness and understanding of the importance of prenatal care. Higher levels of education sharpen their thinking skills and awareness of optimal prenatal care. The higher a mother's education, the better their thinking skills and understanding of the importance of prenatal care.

Unemployed pregnant women are more likely to experience depression, with a percentage of 85.7%. This aligns with Masyuni's research, which found that unemployed pregnant women are 62.3% more likely to experience depression. Pregnant women are permitted to work as long as it does not cause discomfort. Unemployed pregnant women are at an increased risk of depression and aggression related to repetitive work.[30] The mother's work affects the mother's psychological condition, where the mother's workload will affect the mother's physiological and psychological condition.

Research results show that the majority of multiparous mothers are associated with previous negative birth experiences, perceived discomfort, and postpartum fatigue. Other research shows that 56.7% of multiparous pregnant women experience depression.[24,31] The same study found that multiparity increases the risk of depression in mothers.[32]

Multigravida mothers feel they have many children, and because of this pregnancy, it will increase stress on the mother.[31] This is related to previous negative birth experiences, perceived discomfort, and postpartum fatigue, as well as having multiple children, which adds to the burden. Multigravida pregnant women are at risk of developing antenatal depression due to the varying emotional adjustments each expectant mother undergoes.

The occurrence of depression symptoms during pregnancy

World Health Organization (WHO) states that 10% of pregnant women and 13% of postpartum women experience mental disorders such as depression.[33] Around 10-23% of women aged 18 years and over have experienced symptoms of depression, with symptoms including difficulty sleeping, hopelessness, and low energy.[34] A prospective cohort study of 1,262 pregnant women in the United States found that 27.9% of pregnant women experienced mild depression and 18% experienced severe depression.[35]

The results of this study showed that 22.6% of pregnant women experienced depressive symptoms. Similar results have been found in numerous surveys and studies in various countries, ranging from 7% to 25%. Other studies have found that the incidence of prenatal depression is 20-40% in the first trimester, 7.4% in the second and third trimesters, and 12-12.8% in the second and third trimesters.[34]

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The exact cause of depression during pregnancy is unknown. Increased stress hormones in the hypothalamic-pituitary-adrenocortical axis (HPA) are suspected to be a cause. Furthermore, physical and emotional changes during pregnancy (third trimester) require the mother's body to adapt anatomically and physiologically, leading to physical symptoms that can lead to increased psychological symptoms, such as anxiety, restlessness, and fear of pregnancy.[23]

Maternal mental health during pregnancy is associated with an increased risk of preterm birth and low birth weight.[36] Disturbed mental health of pregnant women can cause baby blues syndrome, which is when a mother feels sensitive after giving birth.[37] Stress and depression in pregnant women affect the mother's immune and endocrine systems, negatively impacting fetal development. Immune and endocrine system disorders can lead to premature birth and low birth weight (LBW).[38]

The relationship between depression symptoms and the incidence of LBW

The results of the analysis in this study prove that pregnant women with depressive symptoms have a significant relationship with the occurrence of LBW, with an OR value of 10.66, this means that mothers who experience depression symptoms during pregnancy have a 10.66 times greater chance of having a low birth weight baby compared to mothers who do not experience depression symptoms.

The growth and development of a fetus in the womb is highly dependent on the mother's health. Poor maternal health can result in a low birth weight baby. Low birth weight (LBW) is defined as a baby born weighing less than 2,500 grams, including preterm birth (gestational age <37 weeks), term birth with growth restriction (intrauterine growth restriction/IUGR), or a combination of both.[39] Previous research has shown that prenatal depression is associated with adverse outcomes for both mother and newborn.[40]

The results of this study, in accordance with the results of Mesganaw's research, found that prenatal depression is related to the incidence of low birth weight (LBW). In the results of his research, it was also found that the weight of the babies born was 116 grams lower than that of mothers who did not experience depression symptoms.[41] Hasima's research in Malaysia also found the same thing, depression during pregnancy is associated with an increased risk of low birth weight (LBW).[34]. Eynav & Alyssa's research found that prenatal depression is associated with the incidence of low birth weight babies.[42].According to a study in the United States, antenatal depression increases the risk of small for gestational age (SGA), a birth weight below the 10th percentile for gestational age. These findings are supported by research that found a significant association between pregnant women with high depressive symptoms and SGA (p=0.02) compared to pregnant women with low depressive symptoms.[43] Other research shows a relationship between depressive symptoms in pregnant women and the incidence of low birth weight babies.[44]

The impact of untreated depression on pregnant women is a tendency to have poorer nutrition, neglect their pregnancy, be less compliant with prenatal checkups, and not recognize the signs of labor. Meanwhile, the impact of antenatal depression on the fetus can be seen in birth outcomes. The WHO states that children born to mothers with depression will be negatively affected in their development.[14] Mothers who experience antenatal depression have a greater chance of giving birth to low birth weight (LBW) babies, premature birth, lower APGAR scores, and smaller head circumference.[15] Adverse birth

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outcomes have been reported as a result of antenatal depression. One study identified preterm birth and low birth weight as the main outcomes found.[16] Antenatal depression increases the risk of premature birth and low birth weight (LBW).[17]

Psychological distress during pregnancy can increase adrenaline production. This hormone enters the bloodstream, affecting the heart (palpitations), increasing blood pressure, stomach acid, and lowering the immune system, making the mother more susceptible to illness.[22] Furthermore, psychological distress during pregnancy is associated with an increase in the uterine artery resistance index. This is due to increased plasma noradrenaline concentrations, which decrease blood flow to the uterus. The uterus is highly sensitive to noradrenaline, causing vasoconstriction.[45]

This mechanism can affect intrauterine fetal growth and development, resulting in low birth weight (LBW). Psychological disorders in pregnant women can occur at certain times during pregnancy and have a significant impact, especially on the fetus in the first and third trimesters. This is because the fetus grows and develops very rapidly during this period. However, psychological disorders can result in stunted fetal growth and development. In addition to these mechanisms, fetal growth and development in the womb depend on the mother's health. Pregnancy with stress, anxiety, and depressive symptoms can trigger increased secretion of corticotropin-releasing hormone (CRH), which is known to interact with oxytocin and prostaglandins. These hormones can mediate uterine contractions, resulting in low birth weight (LBW) and preterm birth.[46,47]

Various studies and surveys have shown that psychological disorders during pregnancy are highly detrimental because they can hinder fetal growth and development. The consequences for pregnant women with psychological disorders include inadequate nutrition, inadequate intranatal care, poor obstetrical histories, and substance abuse, all of which increase the risk of low birth weight (LBW).[42]

Despite the seriousness of depression, screening remains underutilized, hindering treatment and efforts to prevent worsening symptoms and associated consequences. Even when depression is diagnosed, it often goes untreated. Although women are typically screened and treated before conception, many pregnant women with depression go untreated.[47]

CONCLUSION

There is a relationship depression symptoms during pregnancy with the incidence of low birth weight (LBW). Mothers who experience depressive symptoms during pregnancy have a 10.66 times greater chance of their babies having low birth weight (LBW) compared to mothers who do not experience depressive symptoms.

Special attention should focus on prenatal mental health, especially in the third trimester, through depression screening and timely referrals for treatment. Counseling should be scheduled appropriately, supported by physical activities such as walking, meditation, prenatal exercise, and breathing techniques. Education for premarital couples is also needed to promote healthy reproduction and awareness of low birth weight (LBW) risks.

Cross-sector collaboration is crucial to address maternal mental health and prevent LBW cases. Future studies with a prospective cohort design are recommended to monitor depression symptoms in each trimester and analyze their relationship with LBW incidence, providing stronger evidence for preventive interventions.

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