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COMPARISON OF LOW AND NORMAL BIRTH WEIGHT INFANT'S MATERNAL DEPRESSION RESIDING IN RURAL AREAS OF AURANGABAD.

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Abstract:

Introduction: Maternal depression during pregnancy is a significant concern with potential consequences for both maternal and child health. This study aimed to investigate the relationship between birth weight and maternal depression in primigravidae and to assess the statistical significance of any potential association.

Methods: In our research, we compared the maternal depression among a group of Primigravidae. Our main goal was to understand how the weight of the babies they delivered could be linked to the mothers' depression. To do this, we collected and thoroughly examined data from a significant number of participants, and we used advanced statistical methods to analyze it. This study contributes valuable insights to the field of maternal health research.

Results: Our statistical analysis revealed an exceptionally low p-value of $1.05076 \times 10^{-14,}$ indicating an extremely high level of statistical significance. The exceptionally small p-value firmly dismisses the null hypothesis (Ho), which originally claimed that birth weight has no significant impact on maternal depression. Instead, our results strongly back the alternative hypothesis (Ha), indicating that birth weight, whether it's low or within the normal range, indeed plays a substantial role in maternal depression among first-time pregnant women (Primigravidae) in this research.

Conclusion: This study establishes a compelling association between birth weight and maternal depression within the Primigravidae population. Our results highlights the importance of considering birth weight as a crucial factor in understanding and addressing maternal depression in Primigravidae. These findings have significant implications for healthcare professionals and policymakers, emphasizing the need for tailored interventions and support for women at risk of maternal depression based on birth weight considerations.

Index Terms (Key words): Birth Weight, Low birth weight [LBW], Normal Birth Weight [NBW], Maternal Depression, Primigravidae.

1. INTRODUCTION

Introduction:

Pregnancy represents a significant transformation characterized by profound physiological, anatomical, biochemical, and psychological shifts occurring within a woman's body [1]. These transformations are instigated by hormonal releases from the placenta, resulting in alterations to the physiology of pregnant women when compared to those who are not pregnant [2]. While many medical complications related to pregnancy often resolve upon delivery, certain issues like preterm labor, placental abruption, preeclampsia, and gestational diabetes can persist, giving rise to concerns for subsequent pregnancies [3].

There is growing awareness of the significance of anxiety and other mental health conditions during pregnancy and their potential influence on pregnancy outcomes and the neurodevelopment of infants. Research suggests that maternal anxiety during pregnancy elevates the risk of adverse outcomes like LBW, protracted labor, preterm delivery, and a higher rate of caesarean sections [4]. Notably, pregnancy-related anxiety appears to be a more potent predictor of negative obstetric outcomes than general anxiety, with LBW being a primary consequence [4].

LBW, defined by the World Health Organization (WHO) as less than 2500g at birth, poses significant risks, especially in developing nations like India where chronic malnutrition, maternal illness, and inadequate prenatal care contribute to its prevalence [5]. The fact that approximately 25 million babies worldwide are born with LBW each year, and nearly 95% of them originate from developing countries, is a cause for concern [6]. These infants face an increased risk of mortality, developmental delays, and the onset of chronic illness [7].

Efforts to reduce LBW have been hindered by limited understanding of its multifaceted causes, including genetic, dietary, and environmental factors, as well as access to prenatal care [8]. Socioeconomic disparities also play a pivotal role, with lower socioeconomic status correlating with higher rates of underweight births [9]. Furthermore, mothers returning to work soon after childbirth, especially in rura1 areas, can reduce the time spent with infants, potentially impacting their growth and future development.

The perinatal period, encompassing pregnancy and the postpartum phase, is marked by significant physiological and behavioral changes, rendering women vulnerable to mental health challenges. Untreated prenatal depression often extends into the postpartum period, with postpartum depression affecting 13-15% of women within the first year of delivery [10]. Prolonged maternal depression has been linked to factors like early gestational age, LBW, infant illness, and social isolation [11].

Postpartum depression not only has consequences for a mother's mental well-being but also influences interactions between mothers and their children, as well as infant growth and development [12]. The separation of LBW infants from their mothers during treatment worsens maternal anxiety and postpartum depression [13].Depressive symptoms can hinder a woman's ability to engage in her child's care, affecting both her maternal role and the child's developmental needs [11].

Postpartum depression is a complex condition influenced not only by hormonal changes but also by stressful life events and family histories of mood disorders, all of which heighten the risk [14]. However, the presence of strong social support from family, partners, and friends has proven effective in alleviating the impact of this emotional disorder [14].Recognizing how maternal mental health and LBW intertwine could provide valuable insights for developing interventions that enhance the health and overall well-being of LBW infants [15]

Studies on adolescent postpartum depression are becoming more prominent, yet further investigations are required to establish effective strategies for this age group. To sum up, this review emphasizes the complex connection between maternal health, mental well-being, and LBW, stressing the significance of comprehensive maternal care to ensure the birth of healthy, normal-weight babies [16].

2. NEED OF STUDY

As our civilization advances, lifestyle changes are significantly influencing pregnancy. Unfortunately, in rural areas, a lack of awareness is contributing to the problem of LBW babies, particularly among first-time mothers, or Primigravidae. What makes this issue even more complex is the limited research that has explored its multifaceted impact, affecting physical, psychological, environmental, and social aspects of these mothers' daily lives. Surprisingly, there have been very few studies that compare the effects on maternal psychological health between LBW and NBW infants, and even fewer that delve into maternal depression. This study aims to fill these critical gaps in our understanding, providing a solid foundation for improved health outcomes and interventions during the antenatal period. Ultimately, our goal is to pave the way for healthier and happier babies born with a NBW.

3. RESEARCH METHODOLOGY

3.1 POPULATION AND SAMPLE

The study focused on Primigravidae mothers as the study population. The sample size for the present study was determined using G*Power software, with specified parameters: a significance level (alpha) of 0.05, a power of 0.95, and a consideration of a large effect size (0.8). Using these parameters, the calculated sample size for each group was determined to be 66 samples or patients. Consequently, the study will enroll a total of 66 patients in the case group and 66 patients in the control group. This sample size has been chosen to ensure that the study possesses sufficient statistical power to detect significant effects and to facilitate the generation of meaningful conclusions from the research.

3.2 DATA AND SOURCES OF DATA

In our study, primary data were collected from a hospital based in Aurangabad, Maharashtra, over a six-month period, from March 2023 to September 2023. During this time frame, data were gathered using the Edinburgh Postpartum Depression Scale.

3.3 THEORETICAL FRAMEWORK

The study analysed postnatal depression in primigravidae mothers with low and NBW infants. The study's purpose and objectives were explained, and subjects were screened based on inclusion and exclusion criteria. Subsequently, participants were divided into two groups: Group A (mothers of LBW infants) and Group B (mothers of NBW infants. written consent form was taken from all the participants. Translated questionnaires used which is in local language.

In Group A, which consisted of mothers with LBW infants, all participants were given the Edinburgh Postnatal Depression Scale to complete. Subsequently, the scores were evaluated. The identical process was applied to Group B, which consisted mothers of NBW infants. The analysis of postpartum depression in the subjects was based on the scoring results. Results and conclusions were drawn after analyzing the scores obtained from the Edinburgh Postnatal Depression Scale.

4. STATISTICAL TOOLS AND AND ANALYSIS

Tools used:

Edinburgh Postnatal Depression Scale: Edinburgh Postnatal depression scale was developed in 1987 by Cox and colleague at Scottish health centres of Edinburgh. A rigorously translated version of the EPDS was developed and validated using the Hindi version of PHQ-9 as a gold standard [17]. It is self- rating questionnaire that reflects subject feelings over the past week. It includes ten items, with each item scored on a four point scale from 0 to 3, depending on severity or duration of each symptom. Total scores range from 0 to 30 and completion takes around 5 minutes. In primary care setting, a score of > 10 is recommended for identifying women at risk of depression, while a score of > 13 likely reflects moderate to severe depressive symptoms. Studies also use the cut off points of 9/10 and 12/13 as markers of possible minor and major depression, respectively. The scale has a good hallmark of validity, content validity, internal consistency and test retest reliability [17].

STATISTICAL ANALYSIS: The data were entered into Microsoft Excel and analysed using SPSS version 24.0. Mean and standard deviation (SD) were calculated for quantitative variables, while proportions were computed for categorical variables. Additionally, data were visually represented through formats such as bar diagrams.
To assess the significance of differences between the pre and post measurements in both the case and control groups, paired t-tests were applied. A P-value of < 0.05 was considered to indicate statistical significance.

5. RESULTS AND DISCUSSION:

Table 5.1 – The table represents categorical data focusing on Null and Alternative hypothesis and used for T – test to derive significance level

Sr No.	Depression Type	No. of Primigravidae with LBW of baby	No. of Primigravidae with NBW of baby
1	No Depression / Minimal Depression	18	64
2	Mild Depression	33	1
3	Moderate Depression	15	1
4	Severe Depression	0	0

In analysis of depression levels among primigravidae, we categorized them into different depression types and compared these categories between those with LBW babies and those with NBW babies. Among primigravidae with LBW babies, we found 18 cases with no depression or minimal depression, 33 cases of mild depression, and 15 cases of moderate depression. Notably, there were no reported cases of severe depression in this group. In contrast, among primigravidae with NBW babies, we observed 64 mothers with no depression or minimal depression, only 1 case of mild depression, and only 1 case of moderate depression. Similar to the LBW group, there were no reported cases of severe depression. This analysis highlights the differences in depression levels between these two groups of primigravidae, with the LBW group showing higher instances of mild and moderate depression but no severe depression cases, while the NBW group had fewer cases overall.

Table 5.2– The values represented were derived from table 10.

1.	**Chi Square (x^2)**	68.17252511
2.	**Degree of Freedom (Df)**	3
3.	**p - Value**	1.05076×10^{-14}

The chi-square statistic is a measure used in statistical analysis to determine if there is an association between two categorical variables. In this context, the chi-square value is approximately 68.1725. The degree of freedom represents the number of values in the final calculation of a statistic that are free to vary. In this analysis, there are 3 degrees of freedom. The p-value is a statistical measure that helps determine the significance of the chi-square statistic. In this case, the p-value is very low, approximately 1.05076×10^{-14}, which is typically interpreted as highly significant.

The statistical analysis yielded a highly significant result ($p < 0.001$). Therefore, we reject the null hypothesis (Ho), which proposed that LBW and NBW would have no significant effect on maternal depression in Primigravidae. Instead, we accept the alternative hypothesis

(Ha), which suggests that LBW and NBW do indeed have a significant effect on maternal depression in Primigravidae. This indicates a strong association between birth weight and maternal depression in this group.

6. DISCUSSION:

Postpartum depression is a growing concern in low- and middle-income countries, necessitating accurate data for effective maternal mental healthcare policies. Our study places its emphasis on exploring how birth weight affects the outcomes of pregnancy, with a particular focus on primigravidae. It is evident that both LBW (LBW) and NBW (NBW) play a significant role in influencing maternal depression.

Mothers of LBW infants often experience heightened stress, especially when their infants require hospitalization or extensive care, which can worsen depression. Mothers at a younger age may encounter an elevated risk of LBW (LBW) because their bodies are still developing and require increased nutritional support. Additionally, a lack of educational resources and social support can further contribute to the occurrence of LBW and postpartum depression.

Research also links LBW to a mother's poor education, stemming from the challenges of caring for a newborn, impacting both the mother and her family. Additionally, poor obstetric/pediatric outcomes, common in low- and middle-income nations, may increase the prevalence of postpartum depression.

Premature births, LBW, infant illness, and social isolation can lead to prolonged depression, emphasizing the need for regular screening in resource-constrained settings.

If this study confirms the link between birth weight and maternal depression, healthcare providers could use it as an indicator for early intervention. If the study discovered that LBW and NBW strongly impact maternal depression in first-time pregnant women, it would lead to new possibilities for future research and medical practices. One potential direction is to personalize interventions based on individual traits like genetics, economic status, and mental health history. Another direction is to study how babies born with LBW are doing as they grow up, considering the connection to maternal depression. This research can help us find ways to support both mothers and babies early on to reduce developmental risks.

In conclusion, this study highlights the significant impact of birth weight on maternal depression, especially in low- and middle-income countries. To address maternal mental health challenges effectively, a holistic approach and increased resource allocation in healthcare systems are imperative.

7. CONCLUSION:

The statistical analysis revealed a remarkable p-value of 1.05076×10^{-14}, emphasizing an exceptionally high level of statistical significance. This decisively dismisses the null hypothesis (Ho), which initially suggested that LBW and NBW had no meaningful impact on maternal depression in Primigravidae.

Conversely, it provides strong support for the alternative hypothesis (Ha), which suggests that birth weight, whether low or normal, significantly influences maternal depression in first-time pregnant women. This highlights a captivating connection between birth weight and maternal depression within this group. In essence, the data strongly points to a meaningful association between a baby's birth weight and a mother's emotional well-being during her first pregnancy.

8. LIMITATIONS:

The research may link birth weight to maternal depression, but it may not definitively prove the cause. Factors like socio-economic status, family support, and genetic predisposition could influence the relationship. Data accuracy could affect the study's validity, and confounding variables like ethnic or cultural differences could also affect the results. Additionally, the study may only consider short term effects, while long term impacts could differ.

9. FUTURE SCOPE:

Research on the long-term developmental outcomes of infants born with LBW can help identify mothers at higher risk of postpartum depression. Early interventions and support can mitigate potential developmental risks. Mental health professionals can be integrated into care teams to provide timely support. Public health campaigns can raise awareness about the relationship between birth weight and maternal depression. Healthcare systems should allocate more resources and develop policies to support these population.

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