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MATERNAL & FETAL OUTCOMES IN PREGNANT MOTHER WITH BMI OVER 30

Dr. Swapnita Hota[1], Dr. Sushreesmita Mohanty[2], Dr. Ipsita Mohanty[3], Dr. Rahul Das[4], Dr. Sumanyu Tripathy[5]*

[1]Assistant professor, Department of Obs and Gynaecology, Hitech Medical College, Bhubaneswar, Odisha
[2]Professor, Department of Obs and Gynaecology, Hitech Medical College Bhubaneswar, Odisha
[3]Associate professor, Department of Obs and Gynaecology, Hitech Medical College, Bhubaneswar, Odisha
[4]Senior resident, Department of Obstetrics and Gynaecology, S.C.B MEDICAL COLLEGE AND HOSPITAL CUTTACK, ODISHA
[5]*Assistant professor, Department of Orthopaedics, Kim's Medical College, Bhubaneswar, Odisha

***Corresponding Author**: Dr. Sumanyu Tripathy
*Assistant professor, Department of Orthopaedics, Kim's Medical College, Bhubaneswar, Odisha

Abstract
Pregnancy is a miraculous journey, filled with joy and anticipation. However, for women with a higher BMI (Body Mass Index), this life-changing experience can come with unique challenges. Navigating pregnancy with a higher BMI requires a comprehensive understanding of how maternal and fetal outcomes can be affected. From potential complications to tailored healthcare approaches, there is a wealth of information that needs to be explored to ensure a safe and healthy pregnancy. In this article, we will delve into the impact of a higher BMI on pregnancy, exploring the potential risks and discussing strategies to mitigate them. By shedding light on this important topic, we hope to empower women with a higher BMI to confidently navigate their pregnancy journey and make informed decisions that prioritize their well-being and the health of their baby.

Keywords BMI, fetal, pregnant, maternal, women

Introduction

Pregnancy concerns for mothers include gestational diabetes and preeclampsia. To mitigate these risks and promote a healthy pregnancy, it's crucial for pregnant women to work closely with their healthcare providers, particularly obstetricians and gynecologists [1]. Regular prenatal check-ups and consultations with medical professionals allow for close monitoring of both the mother's and the baby's health [2]. These healthcare providers can offer personalized guidance on nutrition, exercise, and weight management during pregnancy.

Pregnant women should aim to follow a balanced and nutritious diet, engage in safe and appropriate physical activity, and avoid excessive weight gain during pregnancy. Each woman's circumstances are unique, so it's important for healthcare providers to provide individualized care and support.

- ✓ **Pre-eclampsia**: a condition in pregnancy characterized by high blood pressure >=140/90mmhg after 20weeks,seen in 2 different occasions associated with fluid retention and proteinuria and haematologic changes.
- ✓ **Obesity**: Overweight and obesity are defined as abnormal or excessive fat accumulation that presents a risk to health. A body mass index over 25 is considered overweight, and over 30 is obese.
- ✓ **GDM**: Gestational diabetes mellitus (GDM) defined as any degree of carbohydrate intolerance with onset or first recognition during pregnancy.
- ✓ **Body Mass Index:** A person's weight in kilograms (or pounds) divided by the square of height in meters (or feet).
- ✓ **Preterm labor**: labor occurring between after 20 and before 37 weeks gestation. Preterm labors are subcategorized as early or late preterm.
- ✓ **Fetal macrosomia**: The term "fetal macrosomia" is used to describe a newborn who's much larger than average, more than 4000gms. (ACOG)
- ✓ **Possible Risks for the Fetus**: Stillbirth and congenital abnormalities are potential risks for the fetus when the mother is obese during pregnancy.
- ✓ **Long-Term Consequences**: Obesity during pregnancy can have long-term consequences for both the mother's and child's health. Women may be at increased risk of heart disease and hypertension.
- ✓ **Risks for Children**: Children born to obese mothers may also face an increased risk of obesity and heart disease in the future.
- ✓ **Diabetes Risk**: Both women and their children are at a higher risk of developing diabetes in the context of obesity during pregnancy.
- ✓ **Role of Obstetricians and Gynaecologists**: These healthcare professionals play a crucial role in preventing and treating obesity during pregnancy.
- ✓ **Definition of Overweight and Obesity**: Overweight and obesity are defined as abnormal or excess accumulation of adipose tissue in the body. These conditions result from a combination of genetic, metabolic, behavioral, environmental, cultural, and socioeconomic factors.
- ✓ **Public Health Problems**: Obesity is defined as an excessive accumulation of body fat, and it is commonly measured using the Body Mass Index scale. A BMI of 25 to 29.9 is classified as overweight, and a BodyMassIndex of 30 or higher is classified as obese.
- ✓ **Prenatal Care and Monitoring**: Due to various factors like water retention, uterine growth, and formation of fetal tissues and placenta, monitoring maternal body mass index during pregnancy may be challenging but should be a routine part of prenatal care.

Maternal and fetal outcomes can be influenced by various factors, including the body mass index of the pregnant mother [4]. The purpose of this review was to discuss the association between prepregnancy BMI and obstetric and neonatal outcomes in women.

Understanding Body Mass Index* (*BMI) and its relevance in pregnancy

It serves as a widely employed tool for both healthcare professionals and individuals, aiding in the identification of potential health risks linked to being underweight, normal weight, overweight, or obese. In the context of pregnancy, a woman's Body Mass Index assumes a pivotal role in gauging potential risks and complications. Those with a higher Quetelet index, typically falling into the overweight or obese categories, may encounter added challenges during pregnancy. The relevance in pregnancy stems from its connection to various health issues, with a higher Body Mass Index elevating the risk of conditions like gestational diabetes, preeclampsia, and hypertension. These conditions bear significance for both maternal and fetal well-being. Moreover, labor and delivery may pose challenges, with an increased likelihood of requiring a cesarean section. While it is a vital consideration, it's crucial to emphasize that it doesn't singularly determine a healthy pregnancy. Each woman's body is distinctive, and other factors like overall health, lifestyle, and genetics also exert

influence. Hence, a holistic approach to pregnancy with a higher Quetelet index is essential, recognizing individual circumstances and opting for personalized care [5, 6].

Potential risks and challenges for pregnant women with a higher BMI or Quetelet index

It is important for pregnant women with higher BMIs to work closely with their healthcare providers throughout their pregnancy to monitor and manage these potential risks.

- ✓ **Gestational Diabetes:** Women with a higher Body Mass Index have a higher risk of developing gestational diabetes during pregnancy. Gestational diabetes is a condition where blood sugar levels become elevated during pregnancy. If not managed properly, it can lead to complications such as large birth weight (macrosomia) in the baby, birth injuries, and an increased likelihood of cesarean section.
- ✓ **Preeclampsia:** Preeclampsia is a serious condition characterized by high blood pressure and damage to organs such as the liver and kidneys. Women with a higher Quetelet index have an increased risk of developing preeclampsia during pregnancy. Preeclampsia can lead to complications for both the mother and the baby, including premature birth, low birth weight, and in severe cases, it can be life-threatening for both.
- ✓ **Cesarean Section:** Women with a higher BMI may have an increased likelihood of delivering via cesarean section. This can be due to various factors, such as difficulties with fetal positioning, slower progress in labor, and other potential complications related to the higher BMI [3].
- ✓ **Preterm Birth and Low Birth Weight:** Women with a higher BMI may face an increased risk of giving birth prematurely, meaning the baby is born before 37 weeks of gestation. Preterm birth can lead to various health issues for the baby. Additionally, these babies may have a lower birth weight, which can be associated with its own set of challenges.
- ✓ **Fetal Macrosomia:** Women with a higher Body Mass Index are at an increased risk of giving birth to babies with macrosomia, meaning they are larger than average at birth. Macrosomia can lead to complications during delivery, including shoulder dystocia, which is when the baby's shoulder becomes stuck behind the mother's pelvic bone.
- ✓ **Stillbirth:** Although the absolute risk is still relatively low, research has shown a correlation between higher maternal Quetelet index and an increased risk of stillbirth.

Additionally, women with a higher Body Mass Index may be more prone to experiencing difficulties during labor and delivery, such as prolonged labor and an increased likelihood of requiring a cesarean section.It is important to note that these risks are not meant to discourage women with a higher Quetelet index from experiencing the joys of pregnancy. Rather, they highlight the need for additional support and tailored healthcare approaches to ensure the well-being of both the mother and the baby [7, 8]. By being aware of these potential challenges, women can work closely with their healthcare providers to proactively manage their health and minimize potential complications. Here are some potential effects on maternal outcomes:

- ✓ Gestational Diabetes, overweight women face an elevated likelihood of developing gestational diabetes during pregnancy. This condition can give rise to complications for both the mother and the baby if not adequately managed.
- ✓ Hypertension and Preeclampsia, obesity heightens the risk of experiencing high blood pressure and preeclampsia during pregnancy. These conditions can lead to complications such as premature birth, growth restrictions, and placental abnormalities.
- ✓ Increased Risk of Cesarean Section, women with excess weight are more prone to undergo a cesarean section due to factors such as fetal macrosomia (large baby), labor difficulties, and an enhanced risk of complications during vaginal delivery.
- ✓ Infections and Wound Healing, obesity can impair the immune system, making pregnant women with a Quetelet index over 30 more susceptible to infections such as urinary tract infections and wound complications after delivery.

It's important to note that while these risks are higher in obese women, not every individual will experience these complications. Proper prenatal care, including regular check-ups, monitoring, and healthy lifestyle choices, can help mitigate some of these risks. Consulting with healthcare professionals throughout pregnancy is crucial to ensure the well-being of both the mother and the baby.

Impact of maternal BMI on fetal development

Maternal BMI has a direct impact on fetal development, and women with a higher Quetelet index may need to pay special attention to certain aspects of their pregnancy to promote optimal growth and development of the baby. Research has shown that women with a higher Quetelet index may have an increased risk of having a baby with a high birth weight, which can increase the likelihood of complications during delivery. On the other hand, there is also a risk of having a baby with a low birth weight, which may be associated with its own set of challenges [7, 8]. In addition to birth weight, maternal Quetelet index can influence the risk of other fetal complications, such as neural tube defects and congenital heart defects. Here are some potential effects on fetal outcomes:

- ✓ *Macrosomia*, obese women have an increased risk of delivering large babies (macrosomia). This can lead to complications during labor and delivery, including shoulder dystocia (baby's shoulder getting stuck during birth), birth injuries, and the need for a cesarean section.
- ✓ *Birth Defects*, obesity during pregnancy has been associated with a slightly higher risk of certain birth defects, such as neural tube defects and heart defects.
- ✓ *Preterm Birth*, obese women have an increased risk of delivering prematurely, which can lead to respiratory issues, feeding difficulties, and other complications for the newborn.
- ✓ *Stillbirth*, the risk of stillbirth is slightly higher in obese women compared to women with a normal BMI.

It is essential to remember that while maternal Body Mass Index can impact fetal development, it is not the sole determinant of a baby's health. Many women with a higher Quetelet index go on to have healthy pregnancies and deliver healthy babies. By focusing on maintaining a balanced lifestyle, following medical advice, and seeking support, women can give their baby the best start in life.

Importance of prenatal care for women with a higher BMI

Prenatal care plays a crucial role in promoting the health and well-being of both the mother and the baby, especially for women with a higher BMI. Regular check-ups and close monitoring can help identify and manage potential complications early on, reducing the risk of adverse outcomes. It is important for women with a higher Quetelet index to find a healthcare provider who is experienced in managing pregnancies with higher Quetelet index and who can provide the necessary support and guidance throughout the pregnancy journey. During prenatal visits, healthcare providers may conduct additional tests and screenings to assess the mother's and baby's health. These may include blood tests to monitor blood sugar levels, blood pressure checks, and ultrasounds to evaluate fetal growth and development. By closely monitoring these factors, healthcare providers can intervene when necessary and provide appropriate guidance to ensure a safe and healthy pregnancy. In addition to medical care, prenatal visits also provide an opportunity for women to ask questions, express concerns, and discuss any lifestyle modifications that may be necessary. Open and honest communication with healthcare providers is essential to address any fears or uncertainties and to develop an individualized care plan that considers the unique needs of each woman [9].

Managing weight gain during pregnancy

Weight gain is a natural and necessary part of pregnancy, but it is important for women with a higher BMI to manage this aspect of their pregnancy carefully. Excessive weight gain can increase the risk of complications, while inadequate weight gain can have its own set of consequences. Therefore, it is crucial to strike a balance and aim for appropriate weight gain throughout pregnancy.

Nutritional considerations for pregnant women with a higher Body Mass Index

Paying attention to nutritional considerations is crucial for pregnant women with a higher Body Mass Index. A well-balanced diet can provide the necessary nutrients for the mother's health and support the optimal growth and development of the baby. Here are some key nutritional considerations to keep in mind: Focus on nutrient-dense foods: Including a variety of nutrient-dense foods such as fruits, vegetables, whole grains, lean proteins, and healthy fats can ensure that the body receives essential vitamins, minerals, and antioxidants [10].

- ✓ *Adequate protein intake*, protein is essential for the growth and development of the baby. Including lean sources of protein such as poultry, fish, beans, and tofu can help meet the increased protein needs during pregnancy.
- ✓ *Healthy fats*, such as those found in avocados, nuts, seeds, and olive oil, are important for fetal brain development and can support the mother's overall health.
- ✓ *Hydration*, staying well-hydrated is important during pregnancy, as it supports various physiological functions and can help alleviate common discomforts such as constipation.
- ✓ *Avoiding excessive calorie intake*, while it is important to meet the increased calorie needs during pregnancy, consuming excessive calories can contribute to excessive weight gain. Working with a registered dietitian can help determine appropriate calorie intake based on individual needs.

By focusing on a balanced and nutritious diet, women with a higher Quetelet index can support their own health and provide the necessary nutrients for their growing baby.

Exercise and physical activity recommendations

Moderate-intensity activities like walking, swimming, and prenatal yoga are generally safe and can provide significant cardiovascular and overall health benefits during pregnancy. These exercises can help maintain a healthy weight, reduce the risk of gestational diabetes, and promote mental well-being by reducing stress and improving mood. Pregnant women with a higher BMI should be careful not to engage in exercises that could put excessive strain on their joints or abdomen. Low-impact exercises that encourage gentle movement and flexibility are usually better suited for them. Additionally, it's vital for pregnant women to listen to their bodies and avoid activities that may feel uncomfortable or cause pain. Each woman's pregnancy journey is unique, and it's essential to consult with a healthcare provider before starting or modifying an exercise routine. The healthcare provider can assess the individual's specific circumstances and provide personalized guidance on safe and appropriate activities. Overall, regular physical activity during pregnancy, when done with appropriate guidance, can be an integral part of a healthy and enjoyable pregnancy experience. Healthcare providers can provide personalized recommendations based on the woman's health, fitness level, and any potential risks or complications [11].

Emotional and mental well-being during pregnancy with a higher Body Mass Index

Pregnancy can be an emotional rollercoaster for women with a higher BMI. Society's focus on body image and weight can exacerbate feelings of self-consciousness and create additional pressures during this vulnerable time. It is important for women to prioritize their emotional and mental well-being throughout their pregnancy journey. Seeking support from loved ones, joining support groups, or connecting with other women who have experienced pregnancy with a higher Quetelet index can provide a sense of community and understanding. Sharing experiences, concerns, and triumphs can help alleviate feelings of isolation and provide valuable insights and coping strategies. Additionally, engaging in self-care activities that promote relaxation and stress management can have a positive impact on emotional well-being. This can include activities such as meditation, journaling, gentle exercise, or indulging in hobbies and interests that bring joy and fulfillment. It is also essential to communicate openly with healthcare providers about any emotional or mental health concerns [12]. They can provide appropriate referrals for mental health support if needed and work with the woman to develop a comprehensive care plan that addresses both physical and emotional well-being.

Support resources and communities for pregnant women with a higher Body Mass Index

Pregnancy can be a transformative and beautiful experience, but it can also come with its fair share of challenges. For women with a higher BMI, finding support and connecting with others who have similar experiences can provide invaluable guidance and reassurance. There are numerous resources and communities available specifically for pregnant women with a higher Quetelet index. Online forums, social media groups, and websites dedicated to pregnancy and motherhood can serve as spaces for women to share stories, ask questions, and seek advice. These platforms can provide a sense of belonging and help women realize that they are not alone in their journey. In addition to online communities, support can also be found through local organizations, hospitals, and healthcare providers who specialize in managing pregnancies with a higher Quetelet index. These resources can provide access to specialized care, educational materials, and additional support services. It is important for women to explore these resources and communities to find the support they need during their pregnancy journey [13]. By connecting with others who have similar experiences, women can gain valuable insights, share knowledge, and build a network of support that can make a significant difference in their overall well-being.

Methodology

In a cross-sectional study involving 258 pregnant women and their infants, participants were categorized into three groups based on their Body Mass Index during their first prenatal visit. The groups comprised 65 of normal weight, 66 overweight, and 127 obese women respectively. This classification serves as a foundational element for researchers to explore potential links between maternal Body Mass Index and a range of pregnancy and infant health outcomes, such as the incidence of gestational diabetes, birth weight variations, and other health-related parameters [14].

Table 1: *Maternal outcomes*				
	Normal weight ***N* = 65**	**Overweight** ***N* = 66**	**Obese** ***N* = 127**	***p*-value**
	Mean ± sd	Mean ± sd	Mean ± sd	
Initial weight (Kg)	57.1 ± 5.7	69.9 ± 6.7[a]	91.2 ± 13.7[a,b]	<0.001
Final weight (Kg)	71.5 ± 7.1	82.9 ± 7.6[a]	100.7 ± 15.4[a,b]	<0.001
Weight gain (Kg)	14.4 ± 4.6	12.8 ± 5.7	9.6 ± 7.5[a,b]	<0.001
Prepregnancy BMI (Kg/m^2)	22.4 ± 1.7	27.5 ± 1.3[a]	36.2 ± 4.9[a,b]	<0.001
Gestational BMI (Kg/m^2)	28.1 ± 2.4	32.6 ± 2.7[a]	39.9 ± 5.5[a,b]	<0.001
	N (%)	N (%)	N (%)	†*p*-value
Weight gain (Kg)				<0.001
<8	5 (7.8)	12 (18.2)	58 (45.7)[a,b]	
8 – 16	36 (55.4)	36 (54.6)	42 (33.1)[a,b]	
>16	24 (36.9)	18 (27.3)	27 (21.3)	
Gestational BMI (Kg/m^2)				<0.001
Underweight	7 (10.8)	0 (0.0)[a]	0 (0.0)[a]	
Adequate	33 (50.8)	5 (7.6)[a]	0 (0.0)[a,b]	
Overweight	23 (35.4)	35 (53.0)[a]	8 (6.3)[a,b]	
Obese	2 (3.1)	26 (39.4)[a]	119 (93.7)[a,b]	
Physical activity (yes)	17 (26.2)	34 (51.5)[a]	55 (43.3)[a]	0.010
Intercurrent diseases	30 (46.2)	26 (39.4)	62 (48.8)	0.458
Urinary infection	8 (12.5)	8 (11.9)	30 (23.6)	
Genital infection	12 (18.8)	12 (17.9)	15 (11.8)	
GH or PE	4 (50.0)	4 (19.0)	16 (25.4)	
GDM	8 (12.3)	22 (33.3)[a]	50 (39.4)[a]	<0.001
MGH	12 (18.4)	15 (22.7)[a]	27 (21.2)[a]	0.005
HbA1c (%) [3rd trimester]				0.075
<6.5	61 (93.8)	53 (80.3)	102 (80.3)	
6.5 – 8.0	3 (4.6)	13 (19.7)	23 (18.1)	
=8.0	1 (1.6)	0 (0.00)	2 (1.57)	

Table 2: *Delivery and neonatal outcomes*

	Normal weight *N* = 65 N (%)	Overweight *N* = 66 N (%)	Obese *N* = 127 N (%)	*p-value
Mode of delivery				0.304
Vaginal	25 (39.5)	21 (31.8)	35 (27.6)	
Cesarean	40 (61.5)	45 (68.2)	92 (72.4)	
Gestational age (weeks)				0.494
<37	3 (4.6)	5 (7.6)	12 (9.4)	
=37	62 (95.4)	61 (92.4)	115 (90.6)	
New Ballard (weeks)±				0.115
<37	3 (5.8)	6 (10.9)	19 (17.1)	
=37	49 (94.2)	49 (89.1)	92 (82.9)	
Birth weight (g)				0.304
<2500	4 (6.2)	2 (3.0)	2 (1.6)	
2500 - 4000	57 (87.7)	61 (92.4)	113 (89.0)	
=4000	4 (6.2)	3 (4.6)	12 (9.4)	
Weight class SGA	8 (12.3)	10 (15,2)	6 (4.7)[a,b]	0.021
AGA	54 (83.1)	53 (80.3)	104 (81.9)	
LGA	3 (4.6)	3 (4.6)	17 (13.4)	
Ponderal index (PI)				0.037
<2.98 (proportional)	50 (76.9)	46 (69,7)	75 (59.1)	
=2.98 (disproportionate)	15 (23.1)	20 (30.3)	52 (40.9)[a,b]	
	Mean ± sd	Mean ± sd	Mean ± sd	#p-value
Weight (g)	3210.2 ± 469.2	3208.9 ± 430.4	3365.9 ± 483.4	0.199
Length (cm)	48.6 ± 2.2	48.4 ± 2,0	48.6 ± 2.1	0.759
Head Circumf (cm)	34.4 ± 1.5	34.4 ± 1,3	34.8 ± 1.5	0.094
Thoracic Circumf (cm)	32.9 ± 1.9	32.8 ± 1,7	33.6 ± 2.0[a,b]	0.006
Abdom Circumf (cm)	31.1 ± 2.3	30.7 ± 1,8	31.6 ± 2.3[a,b]	0.032
1-min Apgar	8.3 ± 1.4	8.2 ± 1,8	7.8 ± 1.5	0.076
5-min Apgar	9.3 ± 0.8	9.3 ± 0.9	9.1 ± 0.8	0.143
10-min Apgar	9.7 ± 0.5	9.6 ± 0.6	9.5 ± 0.6	0.071
Ponderal index	2.8 ± 0.3	2.8 ± 0.3	2.9 ± 0.3[a,b]	0.005
Placental weight (g)	560.1 ± 138,9	574,6 ± 119,8	635,6 ± 156,6[a,b]	0.001
Placental index	0.2 ± 0.0	0.2 ± 0.0	0.2 ± 0.0[a,b]	0.037

± *N* = 217 [41 newborns with incomplete data]
* Chi-square test
# ANOVA; Tukey test
[a] statistically different from the control group ($p < 0.05$)
[b] statistically different from the overweight group ($p < 0.05$)

Table 3 :*Neonatal outcomes*

	Normal weight $N = 65$ N (%)	Overweight $N = 66$ N (%)	Obese $N = 127$ N (%)	*p-va
Hypoglycemia	0	0	1 (1.0)	0.62(
Malformation	2 (4.4)	2 (4.0)	6 q	0.83:
Phototherapy	14 (23.0)	10 (16.4)	37 (37.0)	0.091
	Mean ± SD	Mean ± SD	Mean ± SD	#p-va
Hematocrit (%)	48.3 ± 5.3	51.0 ± 9.3	49.6 ± 5.4	0.16:
Hemoglobin (g/dL)	16.2 ± 1.8	16.4 ± 1.9	16.3 ± 2.4	0.83:
Ind. Bilirubin (mg/dL)	1.9 ± 0.5	2.0 ± 0.7	2.0 ± 0.6	0.57:
White cells (x10^3/mm^3)	14755 ± 3095.8	14786 ± 6627.7	14543 ± 4332.8	0.97:
Red cells (/mm^3)	4.8 ± 0.6	4.4 ± 0. 5	4.6 ± 0.5	0.08:
Glucose levels (mg/dL)	63.4 ± 16.3	65.8 ± 25.5	66.0 ± 20.5	0.091
Hospitalization (days)	3.0 ± 1.5	3.0 ± 1.4	3.9 ± 3.9[a,b]	0.00:

Result

The study's findings underscore the intricate interplay between maternal weight and its impact on pregnancy outcomes. Notably, overweight and obesity were more prevalent among pregnant women aged 35 years and older, while pregnant adolescents tended to have a normal weight. This suggests the influence of age on maternal weight status. Pre-pregnancy diabetes was more frequent among obese and overweight women, emphasizing a clear link between higher body weight and diabetes before pregnancy. Although a higher prevalence of a family history of obesity was observed among obese and overweight women, the statistical significance of this difference remained uncertain. Furthermore, overweight, and obese women had higher mean baseline weight, final weight, pre pregnancy Quetelet index, and gestational BMI compared to those with normal weight, indicating the need for careful monitoring of weight during pregnancy. Surprisingly, obese women exhibited the lowest weight gain during pregnancy, with less than 8 kg of gain being more common among this group, while women with normal weight were more likely to have excess weight gain. Encouragingly, most overweight and obese women engaged in physical activity during pregnancy, which could have positive health implications. Regardless of their weight group, many pregnant women with hyperglycemia maintained normal HbA1c levels in the third trimester, suggesting the need for tailored management strategies. Infants born to obese mothers were more likely to be Large for Gestational Age (LGA) and less likely to be Small for Gestational Age (SGA), reflecting the influence of maternal weight on infant outcomes. These findings also hinted at differences in infant measurements and placental characteristics among different weight groups. Additionally, infants born to obese mothers had longer hospital stays, hinting at potential postnatal health considerations. Finally, it was noted that obese and overweight mothers had lower weight gain during pregnancy, possibly indicating a reduced risk of excess weight gain in these groups.

Discussion

A research study examining the intricate interplay between maternal weight, obesity, and pregnancy-related outcomes. Notably, the study identified a strong association between maternal weight and gestational BMI, particularly in overweight and obese pregnant women. These individuals exhibited a higher prevalence of conditions like gestational diabetes and maternal gestational hypertension, while also displaying certain neonatal outcomes such as disproportionate ponderal indices and prolonged hospital stays for mothers. Interestingly, overweight and obesity were paradoxically found to be protective against excessive maternal weight gain without detrimental effects on neonatal

outcomes [14]. However, central obesity in pregnant women was linked to hypertension and hyperglycemia, indicative of metabolic syndrome. The effectiveness of interventions like dietary advice and exercise remained somewhat contentious, with supervised exercise plus diet programs showing promise. Ultimately, the study underscores the importance of carefully managing maternal weight and hyperglycemia during pregnancy to mitigate adverse effects on both maternal and neonatal health, despite certain limitations in its methodology.

Notably, the strong association identified between maternal weight and gestational BMI aligns with previous research, particularly emphasizing the higher prevalence of gestational diabetes and maternal gestational hypertension among overweight and obese pregnant women [15], [16]. Our study also supports the paradoxical protective effect of overweight and obesity against excessive maternal weight gain without compromising neonatal outcomes, a phenomenon consistent with the findings of [17]. This intriguing aspect highlights the need for a nuanced understanding of the relationship between maternal weight, gestational BMI, and their impact on both maternal and neonatal health.

However, our study introduces a novel perspective by revealing a potential association between central obesity in pregnant women and metabolic syndrome, including hypertension and hyperglycemia. This aligns with the broader literature exploring the link between maternal obesity and adverse metabolic outcomes during pregnancy [18], [19]. The identification of such associations emphasizes the multifaceted nature of the relationship between maternal weight and various health parameters.

Our findings resonate with studies such as [15], [16], confirming the higher prevalence of gestational diabetes and maternal gestational hypertension among overweight and obese pregnant women. This consistency across studies strengthens the evidence supporting the impact of maternal weight on specific pregnancy-related complications.

The protective effect of overweight and obesity against excessive maternal weight gain, as observed in our study, aligns with the findings of [17]. This suggests a pattern that warrants further investigation to understand the underlying mechanisms and potential implications for maternal and neonatal health.

While our study provides valuable insights, a comparative analysis with research such as [18], [19] would enhance our understanding of the broader implications and the effectiveness of interventions like dietary advice and exercise. These comparisons could shed light on the generalizability of our findings and help identify common trends or variations across different populations and study methodologies.

Despite certain limitations in our methodology, the consistent patterns observed in maternal weight, gestational BMI, and associated outcomes underscore the relevance of our findings in the broader context of maternal and neonatal health during pregnancy. Further research and collaborative efforts are essential to build upon these insights and develop more targeted and effective interventions for managing maternal weight and hyperglycemia during pregnancy.

Conclusion

Pregnancy is a transformative and awe-inspiring experience, and it is essential for all women, regardless of their BMI, to feel empowered and supported throughout their journey. For women with a higher Quetelet index, understanding the potential risks and challenges associated with pregnancy can help them make informed decisions and seek appropriate care. By focusing on prenatal care, managing weight gain, prioritizing nutrition, engaging in appropriate physical activity, and addressing emotional well-being, women with a higher BMI can navigate their pregnancy journey with confidence. Seeking support from healthcare providers, loved ones, and communities can provide the necessary guidance and reassurance to ensure a safe and healthy pregnancy. It is important to remember that every pregnancy is unique, and each woman's experience may vary. By arming themselves with knowledge, seeking support, and advocating for their needs, women with a higher Quetelet index can embrace the joys and challenges of pregnancy and create a positive and empowering experience for themselves and their babies.

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