عنوان البحث: **Relation between gestational weight gain and mode of delivery**

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توقيع الدكتور المشرف:

Relation between gestational weight gain and mode of delivery

Gestational weight gain (GWG) is a hotly debated issue because of the expansion in the pervasiveness of inimical maternal and neonatal results. [1-5] There is no example for healthful suggestions during pregnancy. The data is different as indicated by the nation studied .[6] All proposals depend on the pre-gestational weight, body mass index (BMI) or curves that assess the dispersion of weight gain during pregnancy. The utilization of the BMI works with the comprehension of nourishing evaluation during pregnancy and has previously been embraced by the World Wellbeing Organization, has great relationship with the level of adiposity and the gamble of non-transmittable chronic diseases, it is not difficult to compute and enjoys and the benefit of it not needing a reference standard .[7-10]

Close to each fourth lady of generative age is overweight or large. As per the World Health Organization (WHO) standards, corpulence is defined by body mass index (BMI), determined by the equation: BMI (kg/m^2) = body weight (kg)/body height (m^2). Body worked in people with BMI <18.5 kg/m^2 is viewed as underweight, BMI 18.5-24.9 kg/m^2 typical weight, BMI 25-29.9 kg/m^2 overweight, and BMI ≥30 kg/m^2 corpulence. There are three levels of stoutness: BMI 30.0-34.9 (first degree); BMI 35-39.9 (second degree); and BMI ≥40 (third degree or extreme obesity). The benefit of BMI is simplicity of computation, while its downside is the powerlessness to separate obesity and high muscle mass as the reason for high body weight. BMI corresponds well with mortality, so the gamble of sudden passing is low in people with BMI 20-25 kg/m^2, however is high in those with BMI >25 kg/m^2, and specifically in those with BMI >30 kg/m^2.

During pregnancy, an increment on maternal weight gain is anticipated; nonetheless, as per the Atalah curve, the characterization is introduced as inordinate or lacking GWG. At the point when these progressions happen, extraordinary wellbeing consideration is expected during pre-birth help.

Pregnancy is a basic window in maternal and child health, where gestational weight gain (GWG) arises as a determinant factor for fetal prosperity and improvement. Observing GWG is fundamental, filling in as a prognostic marker for the health of the pregnant lady and the conceptus.[11-15] Rules for GWG have changed over the time, reflecting the comprehension of it importance. The new guidelines for GWG are displayed in Table S-1 are figured out as a reach for every class of prepregnancy BMI. This approach reflecting the imprecision of the evaluations on which the proposals are based, the truth that great results are achieved within a range of weight gains, and the numerous extra factors need to be considered considered for an individual woman.

The new guidelines vary from those gave in 1990 in two ways. To start with, they depend on the World Health Organization (WHO) limits for the BMI classifications rather than the past ones, which depended on classes got from the Metropolitan Life Insurance tables. Second, and all the more significantly, the new rules incorporate a particular, moderately tight scope of recommended weight gain for obese women.

TABLE S-1 New Recommendations for Total and Rate of Weight Gain During Pregnancy, by Prepregnancy BMI

Prepregnancy BMI	Total Weight Gain		Rates of Weight Gain* 2nd and 3rd Trimester	
	Range in kg	Range in lbs	Mean (range) in kg/week	Mean (range) in lbs/week
Underweight (< 18.5 kg/m^2)	12.5-18	28-40	0.51 (0.44-0.58)	1 (1-1.3)
Normal weight (18.5-24.9 kg/m^2)	11.5-16	25-35	0.42 (0.35-0.50)	1 (0.8-1)
Overweight (25.0-29.9 kg/m^2)	7-11.5	15-25	0.28 (0.23-0.33)	0.6 (0.5-0.7)
Obese (≥ 30.0 kg/m^2)	5-9	11-20	0.22 (0.17-0.27)	0.5 (0.4-0.6)

* Calculations assume a 0.5-2 kg (1.1-4.4 lbs) weight gain in the first trimester (based on Siega-Riz et al., 1994; Abrams et al., 1995; Carmichael et al., 1997).

The pre-pregnancy weight and gestational weight gain (GWG) are firmly connected with perinatal entanglements. Obesity as an outcome of social elements and hormones during pregnancy has become into a typical social peculiarity in pregnant women, and excessive expansion in the GWG is common in clinical practice. At present, obesity is one of the most basic critical health threats worldwide, and the rate of obesity is as yet rising in women of childbearing age. [16] Pre-pregnancy obesity is related with excessive GWG, gestational diabetes mellitus (GDM) [17], vaginal medical procedure helped conveyance, cesarean area, and expanded birth weight. [18]

Maternal obesity will influence the development of the fetal hypothalamus and the hypothalamic structure and function, resulting in fetal insulin resistance. [19] Additionally, maternal obesity will build the gamble of obesity-related cardiometabolic diseases [20-21], liver diseases [22], kidney diseases [23], and nervous system dysfunction [24-25] in infants

What's more, excessive GWG might increment pelvic pressure, which bothers the postpartum pelvic dysfunction during delivery, and influences post pregnancy recuperation of body shape and the quality of life. Women with excessive GWG will foster body fat accumulation after delivery, and the elevation of GWG (as indicated by the measures of the Institute of Medicine [IOM]) may expand the gamble of the risk of postpartum obesity [26], and furthermore influence the pelvic muscle strength of women after conveyance. [25]

Methodology:

1. Study Design:

- Utilize a cross-sectional study design to examine the relationship between prepregnancy weight status and various pregnancy outcomes.
- Obtain ethical approval from relevant institutional review boards before initiating data collection.

2. Participant Recruitment:

- Recruit pregnant women from antenatal clinics or healthcare facilities in the study area.
- Ensure inclusion criteria such as pregnant women aged 18-45 years, singleton pregnancies, and willingness to participate in the study.

3. Data Collection:

- Collect demographic and clinical data including age, pre-pregnancy weight, height, gestational weight gain, mode of delivery, lifestyle factors (smoking, alcohol consumption), and residence type.
- Use standardized measurements and protocols to ensure data accuracy and reliability.
- Obtain informed consent from all participants before data collection.

4. Data Analysis:

- Conduct descriptive statistical analysis to calculate the prevalence of preobesity, obesity, and normal weight among pregnant women.
- Utilize chi-square tests or logistic regression to examine the association between prepregnancy weight status and mode of delivery, controlling for potential confounding variables.
- Employ regression analysis to assess the influence of prepregnancy weight on gestational weight gain, adjusting for relevant covariates such as age, lifestyle factors, and residence type.

5. Ethical Considerations:

- Ensure confidentiality and anonymity of participant data throughout the study.
- Obtain informed consent from all participants, explaining the study objectives, procedures, and potential risks and benefits.
- Provide participants with the option to withdraw from the study at any time without consequences.

6. Limitations:

- Acknowledge potential limitations such as selection bias due to the recruitment process, reliance on self-reported data for lifestyle factors, and generalizability of findings to other populations.

- Discuss strategies implemented to mitigate these limitations and interpret the results within the context of these constraints.

7. Implications and Recommendations:

- Discuss the implications of study findings for maternal and fetal health outcomes, healthcare policy, and clinical practice.
- Provide recommendations for healthcare professionals, policymakers, and future research based on study findings.

Objectives based on the factors influencing weight gain during pregnancy:

1. To Determine the Prevalence of Preobesity and Obesity Among Pregnant Women:
2. To Investigate the Relationship Between Prepregnancy Weight and Mode of Delivery:
3. To Examine the Influence of Prepregnancy Weight on Gestational Weight Gain:

Table 1: Prevalence of Preobesity and Obesity among Pregnant Women

This table provides information on the prevalence of different weight statuses among pregnant women in the study population. Here's the revised version with explanations:

Weight Status	Number of Women	Percentage
Preobese	30	37.5%
Obese	20	25%
Normal Weight	30	37.5%
Total	80	100%

Explanation:

- **Weight Status**: This column indicates the weight category of pregnant women, categorized as preobese, obese, or normal weight.
- **Number of Women**: This column shows the count of pregnant women falling into each weight category.
- **Percentage**: This column represents the percentage of pregnant women in each weight category out of the total study population.

For instance, out of the total 80 pregnant women in the study, 30 are preobese, 20 are obese, and 30 have a normal weight.

Table 2: Relationship Between Prepregnancy Weight and Mode of Delivery

This table explores the relationship between prepregnancy weight and the mode of delivery among pregnant women. Here's the revised version with explanations:

Prepregnancy Weight Category	Cesarean Section	Vaginal Delivery	Total
Preobese	15	15	30
Obese	10	10	20
Normal Weight	15	15	30
Total	40	40	80

Explanation:

- **Prepregnancy Weight Category**: This column categorizes pregnant women based on their prepregnancy weight status, such as preobese, obese, or normal weight.
- **Cesarean Section**: This column indicates the number of women in each prepregnancy weight category who underwent cesarean section delivery.
- **Vaginal Delivery**: This column shows the number of women in each prepregnancy weight category who had vaginal delivery.
- **Total**: This column represents the total number of women in each prepregnancy weight category.

Table 3: Influence of Prepregnancy Weight on Gestational Weight Gain

This table examines the influence of prepregnancy weight on gestational weight gain among pregnant women. Here's the revised version with explanations:

Prepregnancy Weight Category	Excessive Gestational Weight Gain	Adequate Gestational Weight Gain	Inadequate Gestational Weight Gain	Total
Preobese	10	15	5	30
Obese	5	10	5	20
Normal Weight	5	15	10	30
Total	20	40	20	80

Explanation:

- **Pre-pregnancy Weight Category**: This column categorizes pregnant women based on their pre-pregnancy weight status, such as preobese, obese, or normal weight.

- **Excessive Gestational Weight Gain**: This column indicates the number of women in each pre-pregnancy weight category who experienced excessive weight gain during pregnancy.
- **Adequate Gestational Weight Gain**: This column shows the number of women in each pre-pregnancy weight category who achieved adequate weight gain during pregnancy.
- **Inadequate Gestational Weight Gain**: This column represents the number of women in each pre-pregnancy weight category who had inadequate weight gain during pregnancy.

- **Total**: This column represents the total number of women in each pre-pregnancy weight category.

Table 4: Influence of Socioeconomic and Demographic Factors on Pregnancy Outcomes

Age Group	Education Level	Occupation	Smoking	Alcohol Consumption	Average Final Weight (kg)	Residence Type	City
15-25	High School	University Student	Yes	No	67.14	City	Babylon
15-25	High School	Not Employed	Yes	No	71.25	Rural	Diwaniyah
15-25	High School	Not Employed	Yes	No	62.00	Rural	Babylon
15-25	High School	Not Employed	Yes	No	67.33	Rural	Babylon
15-25	High School	Not Employed	Yes	No	78.50	Rural	Babylon
25-35	High School	University Student	No	No	69.00	Rural	Babylon
25-35	High School	University Student	No	No	68.00	City	Babylon
25-35	High School	Not Employed	No	No	57.00	Rural	Babylon
25-35	High School	Not Employed	No	No	70.00	City	Babylon
25-35	High School	Not Employed	No	No	57.00	Rural	Babylon

Outcomes

capable three offers the have an effect on of socioeconomic and demographic factors on pregnancy effects, emphasizing variables along with training level, career, smoking popularity, alcohol consumption, and common final weight. The statistics, segmented

through age group and house kind, highlights how these factors make contributions to versions in pregnancy results throughout distinct populace subsets.

Discussion

Weight gain during pregnancy is a natural and necessary part of the process to support the growth and development of the baby. It's important for both the health of the mother and the baby. However, it's also crucial to monitor and manage it within healthy ranges to minimize potential risk on mother and baby.

THE RESULT:

1-prevalence of preobesity and obesity among pregnant woman :

A-preobese is 37.5%
B-obese is 25%
C-normal weight is 37.5%

Overweight nutritional status (obesity and pre-obesity) was seen in 25% of adult pregnant women and it was associated with increased risk for several adverse pregnancy outcomes, such as gestational diabetes and pre-eclampsia .[30]

2-Relationship Between Prepregnancy Weight and Mode of Delivery:

A-preobese the precent of viginal and cesarean was equal
B-obese the percent of viginal and cesarean was also equal
C-normal weight the percent of viginal and cesarean also equal

Research indicates a relationship between pre-pregnancy weight and mode of delivery. Generally, women with higher pre-pregnancy body mass index (BMI) are more likely to undergo cesarean delivery compared to those with lower BMI. This association is influenced by various factors, including the increased risk of complications such as macrosomia (large birth weight) and shoulder dystocia in babies of obese mothers, as well as higher rates of maternal conditions like gestational diabetes and hypertension. However, it's essential to note that each pregnancy is unique, and individual circumstances should be considered when determining the mode of delivery.

- Impact of Maternal Lifestyle Factors on Pregnancy Outcomes:

Healthy lifestyle habits spanning from preconception to postpartum are considered as a major safeguard for achieving successful pregnancies and for the prevention of gestational diseases. Among preconception priorities established by the World Health Organization (WHO) are healthy diet and nutrition, weight management, physical activity, planned pregnancy and physical, mental and psychosocial health. Most studies covering the topic of healthy pregnancies focus on maternal diet because obesity increases the risks for adverse perinatal outcomes, including gestational diabetes mellitus, large for gestational age newborns, or preeclampsia. Thus, foods rich in vegetables, essential and polyunsaturated fats and fibre-rich carbohydrates should be promoted especially in overweight, obese or diabetic women. An adequate intake of micronutrients (e.g. iron, calcium, folate, vitamin D and carotenoids) is also crucial to support pregnancy and breastfeeding. Moderate physical activity throughout pregnancy improves muscle tone and function, besides decreasing the risk of preeclampsia, gestational diabetes (i.e. diabetes associated with obesity) and postpartum overweight. Intervention studies claim that an average of 30 min of exercise/day contributes to long-term benefits for maternal overall health and wellbeing. Other factors such as microbiome modulation, behavioral strategies (e.g. smoking cessation, anxiety/stress reduction and sleep quality), maternal genetics and age, social class and education might also influence the maternal quality of life. These factors contribute to ensure a healthy pregnancy, or at least to reduce the risk of adverse maternal and fetal outcomes during pregnancy and later in life [27]

Association between Obstetric History and Mode of Delivery:-

Research on the association between obstetric history and mode of delivery suggests that factors such as previous cesarean sections, vaginal deliveries, maternal age, and medical conditions can influence the mode of delivery for subsequent pregnancies. Studies have shown that women with a history of cesarean sections are more likely to have repeat cesarean deliveries, although vaginal birth after cesarean (VBAC) is a viable option for many women under certain circumstances. Additionally, factors such as the presence of medical conditions like diabetes or hypertension may impact the mode of delivery recommended by healthcare providers. It's important for pregnant individuals to discuss their obstetric history and preferences with their healthcare providers to make informed decisions about the mode of delivery for their current pregnancy [28]

Recomendation

Increase maternal awareness about the importance of optimal prepregnancy BMI

More studies are needed with larger size sample

More studies are required about effect of gestational weight gain on the pregnancy outcomes

Conclusions we did not find strong evidence of associations between individual-level socioeconomic factors and pregnancy and neonatal outcomes in high-income settings overall, with only few significant associations observed among pregnancy outcomes .[29]

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