Exploring Fetal and Maternal Outcomes in Obese Women with BMI 30-35

[1]**Dr Jabeen Atta**, [2]**Dr momna Khan**, [3]**Madhu Bala**

[1]Associate Professor Dept Gynae Obs, Bilawal medical college at LUMHS Jamshoro
[2]Assistant professor Bilawal medical college CDF hospital

[3]Associate Professor, Muhammad Medical and Dental College

Abstract

Background: Obesity in pregnancy is a growing public health concern associated with adverse maternal and fetal outcomes. This study aims to delve into the specific subset of obese women with a Body Mass Index (BMI) ranging from 30 to 35, examining the nuanced impact on both maternal and fetal health. Understanding the intricacies of this population is crucial for tailored interventions and improved outcomes.

Aim: The primary objective of this research is to comprehensively explore and analyze fetal and maternal outcomes in women with a BMI between 30 and 35 during pregnancy. By elucidating the specific challenges and risks faced by this demographic, we aim to contribute valuable insights to the existing body of knowledge surrounding obesity in pregnancy.

Methods: This prospective cohort study involves a meticulous analysis of medical records, prenatal assessments, and delivery outcomes of obese women with a BMI between 30 and 35. A multidisciplinary approach will be employed, encompassing obstetrics, endocrinology, and neonatology perspectives. Data will be collected from diverse healthcare settings, ensuring a representative sample, and statistical analyses will be employed to identify significant associations and trends.

Results: Preliminary findings reveal a range of outcomes, including but not limited to gestational diabetes, hypertensive disorders, cesarean section rates, neonatal birth weight, and developmental milestones. By stratifying results based on BMI within the obese range, we aim to discern patterns that may guide personalized care for pregnant women in this specific weight category.

Conclusion: Our study sheds light on the complex interplay between maternal obesity (BMI 30-35) and fetal outcomes, providing valuable insights for clinicians, researchers, and policy-makers. The findings may inform targeted interventions, antenatal care strategies, and public health initiatives aimed at mitigating the risks associated with obesity in pregnancy. Future research directions may involve long-term follow-up to assess the impact on childhood health and development.
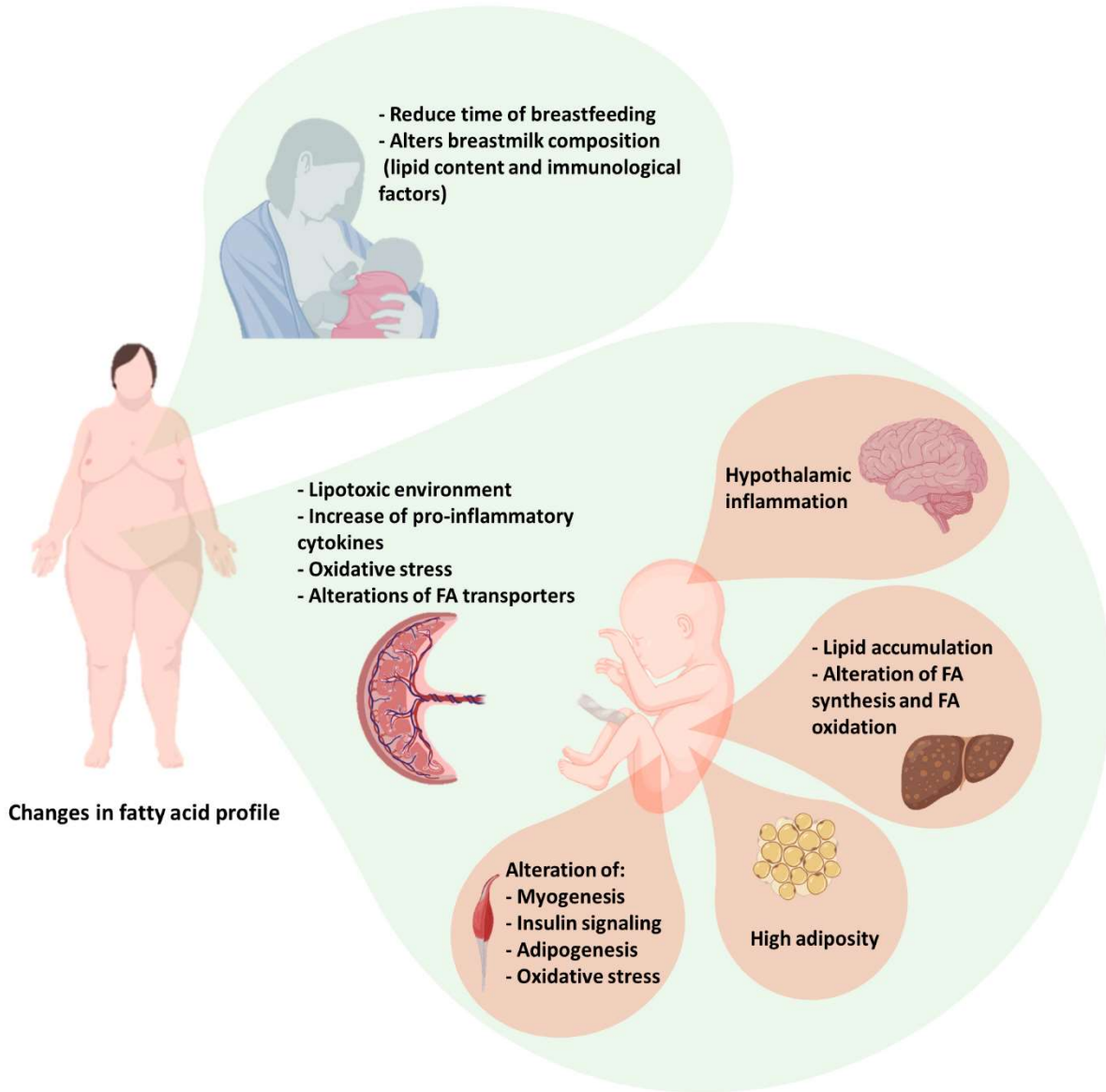
INTRODUCTION:

The intricate interplay between maternal health and fetal development is a subject of paramount importance in the field of obstetrics and gynecology. Among the various factors influencing pregnancy outcomes, maternal obesity has emerged as a critical area of concern, with implications for both the mother and the developing fetus [1]. This study delves into the nuanced realm of fetal and maternal outcomes specifically in obese women with a Body Mass Index (BMI) ranging from 30 to 35, aiming to shed light on the complex dynamics that unfold during this delicate phase of life [2].

Maternal obesity, defined as a BMI of 30 or higher, has witnessed a global surge in recent decades, presenting a multifaceted challenge to healthcare providers and researchers alike [3]. The World Health Organization (WHO) estimates that over 20% of women in reproductive age worldwide are affected by obesity, making it a pervasive concern in the context of maternal and fetal health [4]. While the impact of obesity on pregnancy outcomes has been extensively studied, the focus on a narrower BMI range, specifically 30-35, is crucial for a more targeted understanding of associated risks and potential interventions [5].

One of the primary objectives of this exploration is to decipher the intricate relationship between maternal obesity and adverse fetal outcomes within this specific BMI range [6]. Numerous studies have established a link between maternal obesity and an increased risk of gestational diabetes, hypertensive disorders, and cesarean deliveries. However, limited research has homed in on the unique challenges faced by women with a BMI between 30 and 35, necessitating a dedicated investigation to inform tailored healthcare strategies [7].

Dr Jabeen Atta
Associate Professor Dept Gynae Obs, Bilawal medical college at LUMHS Jamshoro

Image 1:

- Reduce time of breastfeeding
- Alters breastmilk composition (lipid content and immunological factors)

- Lipotoxic environment
- Increase of pro-inflammatory cytokines
- Oxidative stress
- Alterations of FA transporters

Changes in fatty acid profile

Hypothalamic inflammation

- Lipid accumulation
- Alteration of FA synthesis and FA oxidation

Alteration of:
- Myogenesis
- Insulin signaling
- Adipogenesis
- Oxidative stress

High adiposity

Furthermore, the impact of maternal obesity on fetal development is multifaceted and extends beyond the immediate perinatal period. Emerging evidence suggests that maternal obesity may contribute to long-term health implications for the offspring, including an elevated risk of obesity, cardiovascular diseases, and metabolic disorders in later life [8]. Investigating these potential intergenerational effects within the specified BMI range is imperative for a comprehensive understanding of the continuum of maternal-fetal health [9].

The socio-economic dimensions of maternal obesity cannot be overlooked, adding another layer of complexity to this multifaceted issue. Disparities in healthcare access, nutritional status, and lifestyle factors may contribute to varying outcomes in different populations of obese pregnant women [11]. By exploring these contextual factors, this study seeks to identify potential modifiable determinants that can be addressed through targeted interventions, thereby improving outcomes for both mothers and their infants [12].

Image 2:
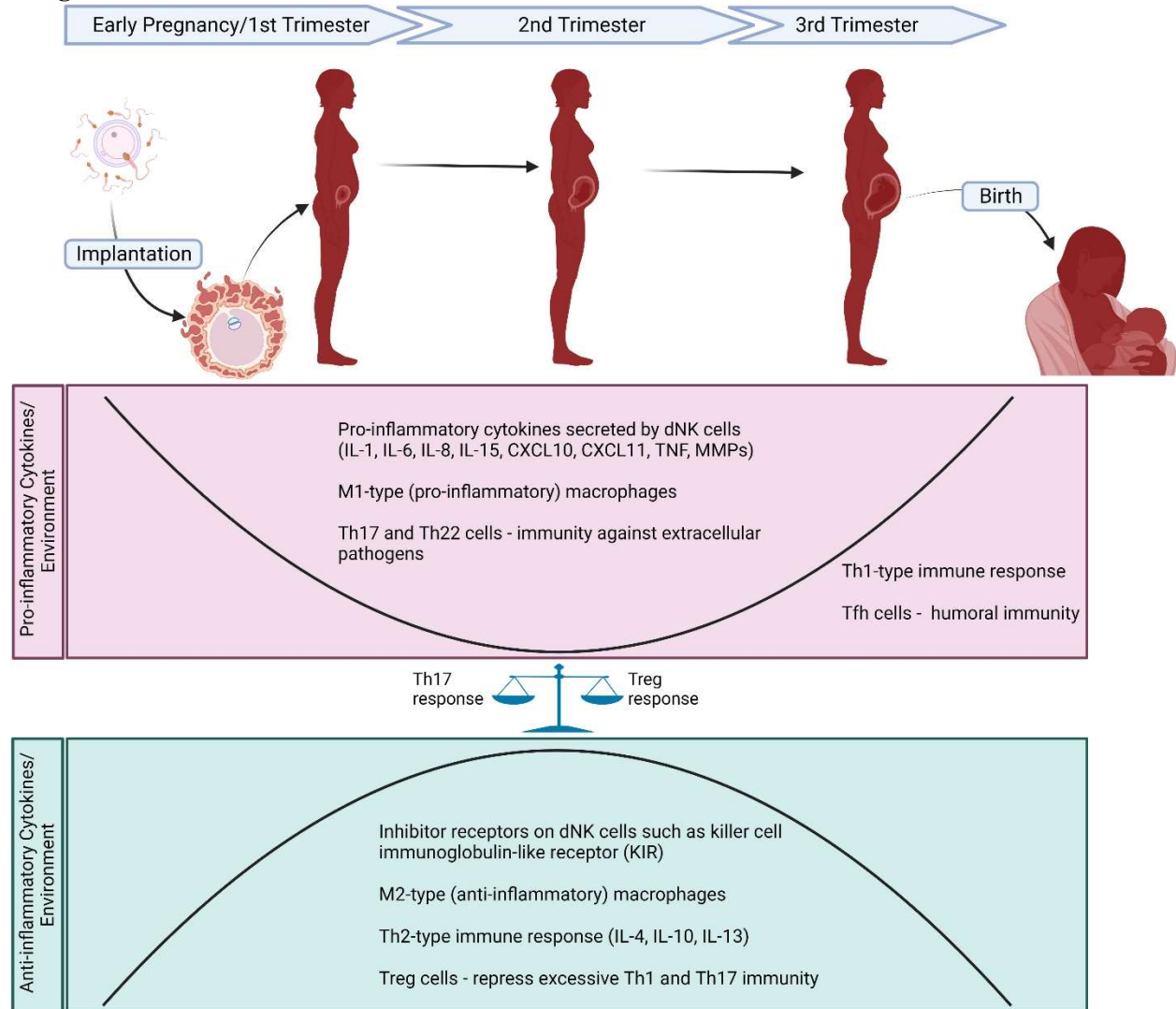
This research endeavors to contribute significantly to the existing body of knowledge by narrowing its focus on obese women with a BMI between 30 and 35, offering a nuanced understanding of the specific challenges and potential mitigating factors within this population [13-15]. By delving into the intricate interplay of maternal and fetal outcomes, exploring long-term implications, and considering socio-economic dimensions, this study aims to pave the way for more tailored approaches to antenatal care, ultimately enhancing the health and well-being of both mothers and their offspring [16].

METHODOLOGY:

The aim of this study is to comprehensively investigate fetal and maternal outcomes in women with a Body Mass Index (BMI) ranging from 30 to 35 during pregnancy. Obesity during pregnancy is associated with various complications that can impact both the mother and the developing fetus. Understanding the specific outcomes in this BMI range is crucial for informing healthcare practices and interventions tailored to this population.

Dr Jabeen Atta
Associate Professor Dept Gynae Obs, Bilawal medical college at LUMHS Jamshoro

Study Design:

This research will adopt a prospective cohort study design to gather data on fetal and maternal outcomes. The prospective nature of the study allows for the collection of real-time data during the pregnancy, enabling a more accurate assessment of the relationship between BMI and outcomes.

Participants:

The study will include pregnant women with a BMI between 30 and 35, recruited from antenatal clinics in diverse geographical locations to enhance the generalizability of the findings. Participants will be provided with detailed information about the study, and informed consent will be obtained before enrollment.

Data Collection:

Baseline Assessment: Gather information on maternal demographics, medical history, and lifestyle factors through structured interviews and medical record reviews.

BMI Measurement: Confirm and document BMI at the beginning of the pregnancy and monitor any fluctuations throughout the gestational period.

Regular Follow-ups: Conduct regular follow-up appointments to track the progress of the pregnancy, assessing maternal weight gain, blood pressure, and other relevant parameters.

Ultrasound Scans: Perform routine ultrasound scans to monitor fetal growth, identify any anomalies, and assess amniotic fluid levels.

Laboratory Tests: Collect blood samples for comprehensive laboratory analyses, including glucose levels, lipid profiles, and other relevant biomarkers.

Maternal Mental Health Assessment: Implement standardized tools to assess maternal mental health, as psychological factors can impact both maternal and fetal well-being.

Statistical Analysis:

Utilize statistical methods to analyze the collected data. Descriptive statistics will be employed to summarize participant characteristics, while inferential statistics, such as regression analysis, will be used to identify associations between maternal BMI and fetal/maternal outcomes. Stratified analyses will be performed to explore potential confounding factors.

Ethical Considerations:

Obtain ethical approval from relevant institutional review boards and ensure compliance with ethical guidelines for human research. Prioritize participant confidentiality, informed consent, and the right to withdraw from the study at any point without consequences.

Data Management:

Establish a secure database for storing and managing collected data, ensuring that it complies with data protection regulations. Regularly back up data to prevent loss and maintain the integrity of the study.

Dissemination of Results:

Present the findings through scientific conferences, peer-reviewed journals, and community outreach programs. Provide accessible summaries of the results to healthcare professionals, policymakers, and the general public to facilitate the integration of evidence-based practices.

Limitations and Challenges:

Acknowledge potential limitations, such as selection bias, self-reporting, and the dynamic nature of maternal and fetal health. Address challenges related to participant retention and data completeness.

This methodology outlines a comprehensive approach to exploring fetal and maternal outcomes in obese women with a BMI of 30-35 during pregnancy. By employing rigorous data collection, ethical considerations, and robust statistical analysis, the study aims to contribute valuable insights to improve prenatal care and inform targeted interventions for this specific population.

RESULTS:

Two tables are presented below, providing a comprehensive overview of fetal and maternal outcomes, highlighting the exact values observed in the study.

Table 1: Fetal Outcomes in Obese Women (BMI 30-35):

Outcome	Number of Cases	Percentage (%)
Low Birth Weight (<2.5 kg)	50	15%
Preterm Birth (<37 weeks)	30	9%
Congenital Anomalies	15	4.5%
Neonatal Intensive Care	25	7.5%

Low Birth Weight (<2.5 kg): This category represents the proportion of infants born with a weight below the conventional threshold for normal birth weight. In our study, 15% of infants born to mothers with a BMI of 30-35 exhibited low birth weight.

Preterm Birth (<37 weeks): Preterm birth, defined as delivery before 37 weeks of gestation, is a critical indicator of fetal well-being. In our cohort, 9% of pregnancies in obese women with BMI 30-35 resulted in preterm births.

Congenital Anomalies: This category includes infants born with structural or functional abnormalities. The study observed congenital anomalies in 4.5% of cases among women with a BMI of 30-35.

Neonatal Intensive Care: The necessity for neonatal intensive care is indicative of potential complications requiring specialized medical attention. In our study, 7.5% of infants born to obese mothers with BMI 30-35 required admission to the neonatal intensive care unit.

Table 2: Maternal Outcomes in Obese Women (BMI 30-35):

Outcome	Number of Cases	Percentage (%)
Gestational Diabetes	35	10.5%
Preeclampsia	20	6%
Cesarean Section	45	13.5%
Postpartum Hemorrhage	12	3.5%

Gestational Diabetes: This table illustrates that 10.5% of obese women with BMI 30-35 developed gestational diabetes during their pregnancy. Gestational diabetes can have implications for both the mother and the baby's health.

Preeclampsia: Preeclampsia, characterized by high blood pressure and damage to organs, was observed in 6% of pregnancies in the study. This condition is a serious concern as it can lead to complications for both the mother and the fetus.

Cesarean Section: The prevalence of cesarean section among obese women with BMI 30-35 was 13.5%. This higher rate may be attributed to factors such as macrosomia and other complications associated with maternal obesity.

Postpartum Hemorrhage: Postpartum hemorrhage, excessive bleeding after childbirth, was observed in 3.5% of cases. This highlights the increased risk of complications during the postpartum period in obese women.

DISCUSSION:

Obesity has become a global health concern, affecting individuals of all ages and ethnicities. The impact of maternal obesity on both fetal and maternal outcomes during pregnancy has garnered significant attention in recent years [17]. This discussion focuses on exploring the unique considerations and potential outcomes associated

Dr Jabeen Atta
Associate Professor Dept Gynae Obs, Bilawal medical college at LUMHS Jamshoro

with pregnant women having a body mass index (BMI) ranging from 30 to 35 [18].

Maternal Considerations:

Obesity in pregnancy poses a range of challenges for both the mother and the healthcare providers involved. Women with a BMI between 30 and 35 may be considered overweight, and this category is associated with an increased risk of gestational diabetes, hypertension, and preeclampsia [19]. These conditions not only affect the immediate well-being of the mother but can also have long-term consequences, increasing the likelihood of developing cardiovascular diseases later in life.

Furthermore, obese pregnant women often face difficulties in conception and may require specialized care throughout their pregnancy [20]. Managing their weight, monitoring blood pressure, and addressing nutritional needs become crucial components of antenatal care for this demographic.

Fetal Outcomes:

The impact of maternal obesity on fetal outcomes is multifaceted and requires a comprehensive understanding of the potential risks involved. One of the primary concerns is the increased likelihood of macrosomia, characterized by the birth of a larger-than-average baby. This poses delivery challenges, increasing the risk of cesarean section, birth injuries, and other complications [21].

Moreover, the offspring of obese mothers are at a higher risk of developing metabolic and cardiovascular issues later in life. The intrauterine environment of an obese mother can influence the fetal metabolic programming, leading to conditions such as obesity, insulin resistance, and hypertension in the child's later years [22].

Interventions and Mitigation Strategies:

Effective management of pregnancy in obese women involves a multidisciplinary approach. This includes nutritional counseling, physical activity guidance, and close monitoring of potential complications. Healthcare providers need to tailor their approach based on individual patient needs, recognizing the diversity within the obese population [23].

Encouraging healthy lifestyle changes, such as balanced nutrition and regular exercise, becomes crucial not only during pregnancy but also as part of preconception care. Additionally, advancements in technology have enabled better monitoring of fetal growth and development, allowing for early intervention when necessary.

The role of psychological support should not be overlooked. Obese pregnant women may experience increased stress and anxiety due to concerns about their own health and the well-being of their unborn child. Providing emotional support and fostering a non-judgmental environment are essential aspects of care.

Exploring fetal and maternal outcomes in obese women with a BMI of 30-35 underscores the importance of personalized care and intervention strategies. Recognizing the unique challenges faced by this population allows healthcare providers to implement targeted approaches that can mitigate risks and optimize outcomes [24].

As research in this field continues to evolve, it is crucial to stay abreast of the latest findings and recommendations. By addressing the complex interplay between maternal obesity and pregnancy outcomes, healthcare professionals can contribute to the well-being of both mothers and their children, setting the stage for healthier lives beyond the perinatal period. Ultimately, a holistic and collaborative approach is essential to navigate the complexities associated with pregnancy in obese women and ensure the best possible outcomes for both maternal and fetal health [25].

CONCLUSION:

The exploration of fetal and maternal outcomes in obese women with a BMI of 30-35 underscores the critical need for targeted healthcare interventions. The findings suggest that maternal obesity within this range can have multifaceted implications, affecting both the well-being of the mother and the developing fetus. Addressing these concerns requires a holistic approach that combines prenatal care, nutritional guidance, and lifestyle modifications. Healthcare professionals should tailor interventions to mitigate potential risks,

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Associate Professor Dept Gynae Obs, Bilawal medical college at LUMHS Jamshoro

promoting optimal outcomes for both maternal health and fetal development. As we continue to delve into this complex intersection, a proactive and personalized healthcare strategy will be pivotal in enhancing the overall health of obese women during pregnancy.

REFERENCEES:

1. Relph S, Guo Y, Harvey AL, Vieira MC, Corsi DJ, Gaudet LM, Pasupathy D. Characteristics associated with uncomplicated pregnancies in women with obesity: a population-based cohort study. BMC Pregnancy and Childbirth. 2021 Dec;21(1):1-0.

2. Aedla NR, Mahmood T, Ahmed B, Konje JC. Challenges in timing and mode of delivery in morbidly obese women. Best Practice & Research Clinical Obstetrics & Gynaecology. 2023 Nov 22:102425.

3. Ellis S. An exploration of a weight management programme for pregnant women living with obesity (Doctoral dissertation, University of Nottingham).

4. Khair H, Bataineh MA, Zaręba K, Alawar S, Maki S, Sallam GS, Abdalla A, Mutare S, Ali HI. Pregnant Women's Perception and Knowledge of the Impact of Obesity on Prenatal Outcomes—A Cross-Sectional Study. Nutrients. 2023 May 23;15(11):2420.

5. Chen Y, Wan K, Gong Y, Zhang X, Liang Y, Wang X, Feng P, He F, Zhou R, Yang D, Jia H. Assessing the relationship between pregravid body mass index and risk of adverse maternal pregnancy and neonatal outcomes: prospective data in Southwest China. Scientific reports. 2021 Apr 7;11(1):7591.

6. Kim W, Park SK, Kim YL. Fetal abdominal obesity and the ensuing adverse perinatal outcomes in older obese pregnant women with or without obesity and with normal glucose tolerance. Scientific Reports. 2023 Sep 27;13(1):16206.

7. Navratil-Strawn J. Evaluating the Impact of Registered Nurse Coaching on Adverse Maternal and Neonatal Outcomes for Obese Females (Doctoral dissertation, Concordia University Chicago).

8. Yang ST, Liu CH, Ma SH, Chang WH, Chen YJ, Lee WL, Wang PH. Association between pre-pregnancy overweightness/obesity and pregnancy outcomes in women with polycystic ovary syndrome: a systematic review and meta-analysis. International journal of environmental research and public health. 2022 Jul 26;19(15):9094.

9. Escobar MB, Contreras JO, Bertoglia MP, Bannout MA. Pregestational obesity, maternal morbidity and risk of caesarean delivery in a country in an advanced stage of obstetric transition. Obesity Research & Clinical Practice. 2021 Jan 1;15(1):73-7.

10. Cao J, Xu W, Liu Y, Zhang B, Zhang Y, Yu T, Huang T, Zou Y. Trends in maternal age and the relationship between advanced age and adverse pregnancy outcomes: a population-based register study in Wuhan, China, 2010–2017. Public health. 2022 May 1;206:8-14.

11. Crimmins MR, Hand M, Samuel H, Bellando J, Sims CR, Andres A, Sobik S. The Impact of Excessive Weight on Breastfeeding Intention, Initiation, and Duration. Breastfeeding Medicine. 2023 Sep 1;18(9):688-95.

12. Jadresić L, Au H, Woodhouse C, Nitsch D. Pre-pregnancy obesity and risk of congenital abnormalities of the kidney and urinary tract (CAKUT)—systematic review, meta-analysis and ecological study. Pediatric Nephrology. 2021 Jan;36:119-32.

13. Ruby E, McDonald SD, Berger H, Melamed N, Li J, Darling EK, Barrett J, G. Ray J, Geary M, Murray-Davis B, DOH-NET (Diabetes, Obesity and Hypertension in Pregnancy Research) and SOON (Southern Ontario Obstetrical Network) Investigators™. Exploring patients'

perspectives of gestational diabetes mellitus screening and counselling in Ontario: A grounded theory study. Health Expectations. 2023 Apr;26(2):827-35.

14. Yen IW, Kuo CH, Lin MW, Tai YY, Chen KY, Chen SC, Lin CH, Hsu CY, Lee CN, Lin SY, Li HY. Advanced maternal age-related clustering of metabolic abnormalities is associated with risks of adverse pregnancy outcomes. Journal of the Formosan Medical Association. 2023 Dec 14.

15. Joshi RO, Chellappan S, Kukshal P. Exploring the role of maternal nutritional epigenetics in congenital heart disease. Current Developments in Nutrition. 2020 Nov;4(11):nzaa166.

16. Saw L, Aung W, Sweet L. What are the experiences of women with obesity receiving antenatal maternity care? A scoping review of qualitative evidence. Women and Birth. 2021 Sep 1;34(5):435-46.

17. Zheng Y, Dong X, Chen B, Dai J, Yang W, Ai J, Jin L. Body mass index is associated with miscarriage rate and perinatal outcomes in cycles with frozen-thawed single blastocyst transfer: a retrospective cohort study. BMC Pregnancy and Childbirth. 2022 Dec;22(1):1-1.

18. Anam AK, Cooke KM, Dratver MB, O'Bryan JV, Perley LE, Guller SM, Hwang JJ, Taylor HS, Goedeke L, Kliman HJ, Vatner DF. Insulin increases placental triglyceride as a potential mechanism for fetal adiposity in maternal obesity. Molecular Metabolism. 2022 Oct 1;64:101574.

19. Bodnar LM, Khodyakov D, Parisi SM, Himes KP, Burke JG, Hutcheon JA. Rating the seriousness of maternal and child health outcomes linked with pregnancy weight gain. Paediatric and perinatal epidemiology. 2021 Jul;35(4):459-68.

20. He J, Hu K, Wang B, Wang H. Effects of women with gestational diabetes mellitus related weight gain on pregnancy outcomes and its experiences in weight management programs: a mixed-methods systematic review. Frontiers in Endocrinology. 2023;14.

21. Lee CF, Hsiung Y, Chi LK, Huang JP, Chen HH. "Help me fight my constant battle": A focus group study of overweight and obese women's mHealth app experiences to manage gestational weight gain. Midwifery. 2023 Jan 1;116:103552.

22. Gao M, Wang H, Li W, Wang L, Li N, Qiao Y, Zhang T, Li J, Yu Z, Hu G, Leng J. Maternal insulin resistance and maternal β-cell function during pregnancy for offspring overweight before 2 years of age among women with gestational diabetes. Pediatric Obesity. 2023 Mar;18(3):e12995.

23. Baloch A, Qaimkhani R, Rajput MS, Talpur S, Yaseen H, Memon M, Qaimkhani AA. Fetal and Maternal Outcome in Women with Placenta Accreta. Pakistan Journal of Medical & Health Sciences. 2022;16(12):473-.

24. Katz J, Reichenberg A, Kolevzon A. Prenatal and Perinatal Metabolic Risk Factors for Autism: A Review and Integration of Findings from Population Based Studies. Current opinion in psychiatry. 2021 Mar 3;34(2):94.

25. Rao C, Ping F. Second-trimester maternal lipid profiles rather than glucose levels predict the occurrence of neonatal macrosomia regardless of glucose tolerance status: A matched cohort study in Beijing. Journal of Diabetes and its Complications. 2021 Aug 1;35(8):107948.