

# THE IMPACT OF MATERNAL OBESITY ON PREGNANCY OUTCOMES: A SYSTEMATIC REVIEW OF OBG NURSING INTERVENTIONS

Author's Name: Arti Mishra<sup>1</sup>

### Affiliation:

1. Ph.D. Scholar, People's College of Nursing & Research Center Bhopal, Madhya Pradesh, India. Corresponding Author Name and Email ID: Arti Mishra,

arti.sihmc2013@gmail.com

## ABSTRACT

This systematic review explores the impact of maternal obesity on pregnancy outcomes and highlights the role of obstetric and gynecological (OBG) nursing interventions in mitigating associated risks. Maternal obesity is a significant public health concern that affects a substantial number of pregnant women worldwide, contributing to a range of adverse outcomes for both mothers and infants, including gestational diabetes, hypertension, preeclampsia, and increased rates of cesarean delivery. This review synthesizes current literature on the physiological, psychological, and social implications of obesity during pregnancy and examines how OBG nursing interventions can improve maternal and neonatal health. Evidence indicates that targeted nursing interventions, such as nutritional counseling, exercise recommendations, weight management strategies, and patient education, play a crucial role in promoting healthy weight gain during pregnancy, managing pre-existing conditions, and enhancing overall pregnancy outcomes. Additionally, the review discusses the importance of a multidisciplinary approach, incorporating collaboration between nurses, dietitians, and physicians to provide comprehensive care tailored to the needs of obese pregnant women. By identifying effective nursing practices and areas for further research, this review aims to inform clinical guidelines and enhance the quality of care provided to pregnant individuals affected by obesity, ultimately contributing to better health outcomes for mothers and their children.

Keywords: Maternal obesity, Pregnancy outcomes, OBG nursing interventions, Systematic review, Evidence-based practice



### INTRODUCTION

Maternal obesity has emerged as a pressing public health issue, significantly influencing pregnancy outcomes and posing challenges for healthcare providers. Defined as a body mass index (BMI) of 30 or higher, maternal obesity affects a substantial proportion of pregnant women worldwide and is associated with a myriad of adverse health consequences for both mothers and their infants. These complications can include gestational diabetes, preeclampsia, miscarriage, labor complications, and an increased risk of cesarean delivery, as well as long-term health issues for children such as obesity and metabolic syndrome. The complexities surrounding maternal obesity necessitate a comprehensive understanding of how it impacts pregnancy and delivery, as well as effective interventions to support affected individuals. Obstetric and gynecological (OBG) nursing interventions play a critical role in addressing the unique challenges posed by maternal obesity. Nurses are often the primary point of contact for pregnant women and are uniquely positioned to provide education, support, and care tailored to individual needs. Effective nursing interventions may include nutritional counseling to promote healthy dietary choices, physical activity recommendations, weight management strategies, and psychological support to address the emotional challenges associated with obesity. Furthermore, educating patients about the risks associated with obesity during pregnancy and empowering them to engage in self-management practices can lead to healthier outcomes.

This systematic review aims to evaluate the current literature regarding the impact of maternal obesity on pregnancy outcomes, with a specific focus on the effectiveness of OBG nursing interventions. By synthesizing findings from various studies, this review will highlight best practices, identify gaps in existing research, and provide recommendations for clinical practice. Ultimately, addressing maternal obesity through targeted nursing interventions can contribute to improved pregnancy outcomes, enhance maternal and infant health, and reduce the long-term health risks associated with obesity. As the prevalence of obesity continues to rise, it is imperative that healthcare professionals, particularly nurses, are equipped with the knowledge and skills necessary to support pregnant individuals in achieving optimal health throughout their pregnancy journey.

#### PREVALENCE AND CONSEQUENCES OF MATERNAL OBESITY IN PREGNANCY

Maternal obesity has reached epidemic proportions globally, with significant implications for both maternal and neonatal health. The prevalence of obesity among pregnant women has increased dramatically over the past few decades, with reports indicating that nearly 30% of pregnant women in some regions are classified as obese, defined as having a body mass index (BMI) of 30 or higher. This rising trend is particularly concerning given the increasing rates of obesity in the general population, influenced by factors such as sedentary lifestyles, unhealthy dietary habits, and socio-economic



determinants. The consequences of maternal obesity during pregnancy are multifaceted and can lead to serious health complications for both mothers and their infants.

From a maternal perspective, obesity is associated with an increased risk of gestational diabetes mellitus (GDM), a condition that can lead to long-term metabolic issues for both the mother and child if left unmanaged. Women with obesity are also more likely to experience hypertensive disorders, including preeclampsia, which can result in severe health consequences such as organ failure and increased mortality rates. Additionally, obesity can complicate the labor and delivery process, leading to a higher likelihood of cesarean sections, prolonged labor, and postpartum complications such as infections and delayed recovery.

The consequences extend to the neonatal population as well, with children born to obese mothers facing a higher risk of adverse outcomes. These include an increased likelihood of being born large for gestational age, which can complicate delivery and lead to injuries during birth. Furthermore, infants may experience a greater risk of neonatal intensive care unit (NICU) admission due to complications such as respiratory distress and hypoglycemia. Long-term consequences are also concerning, as children born to obese mothers are at a heightened risk for obesity, metabolic syndrome, and chronic health conditions later in life.

The interplay between maternal obesity and these complications underscores the urgent need for effective interventions and support systems throughout pregnancy. Comprehensive prenatal care that addresses weight management, nutritional education, and regular monitoring can help mitigate the risks associated with maternal obesity. By understanding the prevalence and consequences of maternal obesity, healthcare providers, particularly obstetric and gynecological nurses, can play a crucial role in developing and implementing strategies aimed at promoting healthier pregnancy outcomes and improving the long-term health trajectories for both mothers and their children.

#### THE IMPACT OF MATERNAL OBESITY ON PREGNANCY OUTCOMES

Maternal obesity significantly impacts pregnancy outcomes, contributing to a range of complications that affect both maternal and neonatal health. Women with obesity, defined as a body mass index (BMI) of 30 or higher, are at an elevated risk of developing several gestational conditions that can complicate pregnancy. One of the most common issues is gestational diabetes mellitus (GDM), which occurs when the body cannot produce enough insulin to regulate blood sugar levels during pregnancy. This condition not only poses immediate risks, such as high birth weight and complications during delivery, but it can also lead to long-term health issues for both the mother and child, including an increased risk of type 2 diabetes later in life.

Maternal obesity is strongly associated with hypertensive disorders, such as gestational hypertension and preeclampsia. These conditions can lead to severe complications, including organ dysfunction, placental



abruption, and even maternal and fetal mortality. Pregnant women with obesity are also more likely to experience labor complications, including prolonged labor and a higher likelihood of requiring cesarean delivery. This not only increases the risks associated with surgical intervention but can also lead to longer recovery times and increased postpartum complications such as infections and blood clots.

The impact of maternal obesity extends to neonatal health as well. Infants born to obese mothers are at a greater risk of being large for gestational age (LGA), which increases the likelihood of delivery complications, such as shoulder dystocia. These infants may also experience higher rates of neonatal intensive care unit (NICU) admission due to issues like respiratory distress and hypoglycemia. Moreover, there is evidence suggesting that children born to obese mothers may face long-term health risks, including obesity, metabolic syndrome, and developmental delays, highlighting the transgenerational effects of maternal obesity.

Furthermore, maternal obesity can adversely affect maternal mental health, increasing the likelihood of postpartum depression and anxiety, which can complicate the mother's ability to bond with her child and manage the demands of motherhood. This complex interplay between physical and mental health outcomes underscores the importance of comprehensive prenatal care that includes regular monitoring and tailored interventions aimed at weight management, nutritional counseling, and lifestyle modifications.

Given these profound impacts, it is crucial for healthcare providers to recognize the significance of maternal obesity and implement targeted strategies that promote healthy weight management before, during, and after pregnancy. By addressing the risks associated with maternal obesity, healthcare professionals can improve pregnancy outcomes and enhance the overall health and well-being of mothers and their children, ultimately contributing to healthier communities and reducing the burden of obesity-related health conditions in future generations.

#### OBG NURSING INTERVENTIONS FOR MANAGING MATERNAL OBESITY

Managing maternal obesity in obstetric and gynecological (OBG) nursing practice involves a multifaceted approach that addresses the unique health needs of pregnant women while promoting optimal outcomes for both mother and child. OBG nurses play a critical role in the assessment, education, and support of pregnant individuals with obesity, employing a variety of interventions designed to mitigate the risks associated with excessive weight. One of the primary interventions is thorough assessment and individualized care planning, which begins with evaluating the woman's BMI, medical history, and any existing comorbidities, such as diabetes or hypertension. This assessment allows nurses to identify specific risks and tailor interventions accordingly.

Education is a cornerstone of OBG nursing interventions for maternal obesity. Nurses provide vital information regarding the potential complications of obesity during pregnancy, including gestational



diabetes, hypertension, and delivery complications. By educating patients about the importance of healthy weight management, nurses empower women to make informed choices about their lifestyle. Nutritional counseling is an essential component of this educational process, where nurses can collaborate with registered dietitians to offer personalized meal plans that emphasize balanced nutrition, portion control, and the benefits of consuming nutrient-dense foods. Encouraging healthy eating habits helps mitigate the risk of excessive weight gain during pregnancy, which can further complicate health outcomes.

Physical activity recommendations are also critical nursing interventions. Nurses can encourage pregnant women to engage in regular, moderate exercise tailored to their individual capabilities and preferences. Activities such as walking, swimming, or prenatal yoga can enhance physical well-being, improve mood, and help manage weight. Providing resources for safe exercise options and offering referrals to physical therapists or exercise specialists can further support women in maintaining an active lifestyle.

Monitoring and regular follow-ups are essential components of nursing care for pregnant women with obesity. OBG nurses should establish a schedule for prenatal visits that allows for consistent monitoring of weight gain, blood pressure, and glucose levels, particularly for those at risk of gestational diabetes. This vigilant approach enables early identification and management of any emerging complications. Additionally, mental health support is paramount, as pregnant women with obesity may experience anxiety, depression, or low self-esteem. Nurses can facilitate access to mental health resources and provide a supportive environment where women can discuss their concerns and challenges.

Finally, fostering a collaborative, multidisciplinary care approach enhances the effectiveness of interventions for managing maternal obesity. OBG nurses should work closely with obstetricians, dietitians, psychologists, and other healthcare professionals to create comprehensive care plans that address all aspects of the woman's health. This integrated approach not only improves the quality of care provided but also ensures that women receive holistic support throughout their pregnancy journey.

In summary, OBG nursing interventions for managing maternal obesity encompass a range of strategies including assessment, education, nutritional counseling, physical activity promotion, monitoring, and collaboration with interdisciplinary teams. By employing these comprehensive interventions, nurses can significantly influence the health outcomes of pregnant women with obesity, ultimately leading to healthier pregnancies and improved long-term health for both mothers and their children.

#### IMPLICATIONS OF MATERNAL OBESITY FOR PREGNANCY OUTCOMES

Maternal obesity carries profound implications for pregnancy outcomes and poses significant challenges for obstetric and gynecological (OBG) nursing practice. As the prevalence of obesity among pregnant women continues to rise, healthcare professionals must grapple with the complex health issues that arise



from this condition. The impact of maternal obesity on pregnancy outcomes is substantial, with affected women facing increased risks for various complications, including gestational diabetes mellitus (GDM), hypertensive disorders such as preeclampsia, cesarean delivery, and postpartum complications. These conditions not only jeopardize the health of the mother but also pose risks to the infant, including higher chances of being born large for gestational age, requiring neonatal intensive care, and developing long-term health issues such as obesity and metabolic syndrome.

In the context of OBG nursing practice, the implications of maternal obesity necessitate a shift toward more comprehensive and individualized care strategies. Nurses must prioritize thorough assessments that include detailed evaluations of a woman's medical history, weight status, and psychosocial factors. By doing so, nurses can identify individuals at high risk and implement tailored interventions aimed at promoting healthier weight management and minimizing the likelihood of complications. Education emerges as a critical component of nursing care; OBG nurses are in a pivotal position to provide evidence-based information regarding the risks associated with obesity and the importance of lifestyle modifications, such as improved nutrition and increased physical activity. This educational role extends beyond mere information dissemination; it involves fostering a supportive environment where women feel empowered to make healthy choices.

OBG nursing practice must incorporate multidisciplinary collaboration to effectively manage maternal obesity. Nurses should work alongside obstetricians, dietitians, mental health professionals, and exercise specialists to create comprehensive care plans that address the diverse needs of pregnant women with obesity. This collaborative approach can enhance the quality of care and ensure that interventions are holistic, addressing not only physical health but also emotional and psychological well-being. Additionally, nurses must be equipped to monitor the outcomes of their interventions diligently, adjusting care plans based on ongoing assessments of weight gain, blood pressure, and glucose levels.

The implications of maternal obesity extend to the broader public health landscape as well, highlighting the necessity for healthcare systems to adopt preventive measures and community-based initiatives aimed at reducing obesity rates among women of childbearing age. By promoting healthy lifestyles before and during pregnancy, healthcare providers can contribute to the long-term health of both mothers and their children.

# FUTURE DIRECTIONS FOR RESEARCH AND PRACTICE IN MANAGING MATERNAL OBESITY

As the prevalence of maternal obesity continues to rise, future directions for research and practice must focus on developing innovative and effective strategies to address the associated health risks and improve pregnancy outcomes. One of the primary areas for future research is the exploration of personalized interventions tailored to individual women's needs. This includes investigating the



effectiveness of culturally sensitive approaches that consider diverse backgrounds, socio-economic factors, and personal preferences in dietary habits and physical activity levels. Understanding how these variables interact with maternal obesity can lead to more effective, individualized care plans that resonate with patients and encourage adherence to lifestyle modifications.

Another critical area for future research is the examination of the long-term implications of maternal obesity on both maternal and child health outcomes. Longitudinal studies that track mothers and their children beyond the immediate postpartum period are essential to gain insights into the potential risks of obesity-related conditions, such as metabolic syndrome and cardiovascular diseases, that may develop later in life. This research can inform preventive strategies that healthcare providers can implement early in a child's life, thereby breaking the cycle of obesity across generations.

Moreover, integrating technology into the management of maternal obesity presents exciting opportunities for research and practice. The use of mobile health applications and telehealth platforms can facilitate real-time monitoring of weight, dietary intake, and physical activity, allowing for timely interventions and support. Research is needed to assess the effectiveness of these digital tools in promoting engagement, adherence, and successful weight management among pregnant women. Additionally, studies could explore the impact of virtual support groups, where women can share experiences and challenges, enhancing their motivation and accountability.

From a practice perspective, the implementation of comprehensive, multidisciplinary care models is vital. Future initiatives should emphasize the collaboration between OBG nurses, dietitians, mental health professionals, and other healthcare providers to create holistic care plans that address not only physical health but also psychological and social factors influencing maternal obesity. Training programs that enhance nurses' skills in motivational interviewing, cultural competence, and health coaching can empower them to support women effectively in making lasting changes.

Finally, advocacy for policy changes that promote healthy lifestyles among women of reproductive age is crucial. Research should focus on identifying effective community-based interventions that can be implemented at the population level to reduce the incidence of maternal obesity. This includes initiatives that improve access to healthy foods, promote physical activity in communities, and enhance education on nutrition and wellness.

In summary, the future directions for research and practice in managing maternal obesity should prioritize personalized and culturally relevant interventions, long-term health tracking, the integration of technology, multidisciplinary care approaches, and advocacy for supportive policies. By focusing on these areas, healthcare professionals can contribute to improved pregnancy outcomes and better overall health for mothers and their children, addressing the critical public health challenge posed by maternal obesity.



#### CONCLUSION

In conclusion, the systematic review of the impact of maternal obesity on pregnancy outcomes underscores the urgent need for targeted obstetric and gynecological (OBG) nursing interventions that address the multifaceted challenges posed by this growing public health concern. Maternal obesity is associated with a plethora of adverse outcomes, including gestational diabetes, hypertensive disorders, and increased rates of cesarean deliveries, which not only threaten maternal and neonatal health but also lead to long-term complications for both mothers and their children. This review highlights the critical role that OBG nurses play in mitigating these risks through comprehensive assessment, patient education, and personalized care strategies that promote healthy lifestyle changes.

Effective nursing interventions, such as nutritional counseling, tailored exercise programs, and psychological support, are essential in guiding pregnant women with obesity toward healthier behaviors that can reduce the incidence of obesity-related complications. Furthermore, fostering a collaborative approach involving multidisciplinary teams enhances the overall care provided to these individuals, ensuring that all aspects of their health are addressed holistically. By emphasizing the importance of ongoing monitoring and individualized care plans, OBG nursing practice can significantly improve pregnancy outcomes for women with obesity.

Moreover, the findings of this review call for a shift in healthcare practices toward more proactive and preventative strategies, including community education and policy advocacy aimed at reducing the prevalence of obesity in women of childbearing age. Future research should continue to explore innovative interventions, the long-term effects of maternal obesity, and the effectiveness of technology in supporting weight management and health education.

Ultimately, by implementing evidence-based OBG nursing interventions and fostering an environment of support and education, healthcare providers can make meaningful strides in addressing the challenges of maternal obesity, thereby improving health outcomes and enhancing the quality of life for mothers and their children. This comprehensive approach not only targets immediate pregnancy-related complications but also contributes to the long-term health and well-being of families and communities, aligning with broader public health goals aimed at reducing the impact of obesity across generations.



#### REFERENCE

- Watkins VY, O'Donnell CM, Perez M, Zhao P, England S, Carter EB, Kelly JC, Frolova A, Raghuraman N. The impact of physical activity during pregnancy on labor and delivery. Am J Obstet Gynecol. 2021 Oct;225(4):437.e1-437.e8. doi: 10.1016/j.ajog.2021.05.036. Epub 2021 Jun 1. PMID: 34081895; PMCID: PMC10564562.
- Reichetzeder C. Overweight and obesity in pregnancy: their impact on epigenetics. Eur J Clin Nutr. 2021 Dec;75(12):1710-1722. doi: 10.1038/s41430-021-00905-6. Epub 2021 Jul 6. PMID: 34230629; PMCID: PMC8636269.
- Lin J, Gu W, Huang H. Effects of Paternal Obesity on Fetal Development and Pregnancy Complications: A Prospective Clinical Cohort Study. Front Endocrinol (Lausanne). 2022 Mar 14;13:826665. doi: 10.3389/fendo.2022.826665. PMID: 35360083; PMCID: PMC8963983.
- Muglia LJ, Benhalima K, Tong S, Ozanne S. Maternal factors during pregnancy influencing maternal, fetal, and childhood outcomes. BMC Med. 2022 Nov 1;20(1):418. doi: 10.1186/s12916-022-02632-6. PMID: 36320027; PMCID: PMC9623926.
- Mousa A, Naqash A, Lim S. Macronutrient and Micronutrient Intake during Pregnancy: An Overview of Recent Evidence. Nutrients. 2019 Feb 20;11(2):443. doi: 10.3390/nu11020443. PMID: 30791647; PMCID: PMC6413112.
- Langley-Evans SC, Pearce J, Ellis S. Overweight, obesity and excessive weight gain in pregnancy as risk factors for adverse pregnancy outcomes: A narrative review. J Hum Nutr Diet. 2022 Apr;35(2):250-264. doi: 10.1111/jhn.12999. Epub 2022 Mar 20. PMID: 35239212; PMCID: PMC9311414.
- Talmor A, Dunphy B. Female obesity and infertility. Best Pract Res Clin Obstet Gynaecol. 2015 May;29(4):498-506. doi: 10.1016/j.bpobgyn.2014.10.014. Epub 2014 Nov 7. PMID: 25619586.
- Goran MI, Plows JF, Ventura EE. Effects of consuming sugars and alternative sweeteners during pregnancy on maternal and child health: evidence for a secondhand sugar effect. Proc Nutr Soc. 2019 Aug;78(3):262-271. doi: 10.1017/S002966511800263X. Epub 2018 Dec 3. PMID: 30501650; PMCID: PMC7441786.
- Ferrell EL, Choudhry AA, Schon SB. Obesity and In Vitro Fertilization. Semin Reprod Med. 2023 Jul;41(3-04):87-96. doi: 10.1055/s-0043-1776420. Epub 2023 Nov 1. PMID: 37913788.
- Ribeiro LM, Sasaki LMP, Silva AA, Souza ES, Oliveira Lyrio A, C M G Figueiredo A, Gottems LBD. Overweight, obesity and assisted reproduction: A systematic review and meta-analysis. Eur J Obstet Gynecol Reprod Biol. 2022 Apr;271:117-127. doi: 10.1016/j.ejogrb.2022.01.019. Epub 2022 Jan 31. PMID: 35183001.

- Wilson RM, Messaoudi I. The impact of maternal obesity during pregnancy on offspring immunity. Mol Cell Endocrinol. 2015 Dec 15;418 Pt 2(0 2):134-42. doi: 10.1016/j.mce.2015.07.028. Epub 2015 Jul 30. PMID: 26232506; PMCID: PMC4674375.
- Huifen Z, Yaping X, Meijing Z, Huibin H, Chunhong L, Fengfeng H, Yaping Z. Effects of moderateintensity resistance exercise on blood glucose and pregnancy outcome in patients with gestational diabetes mellitus: A randomized controlled trial. J Diabetes Complications. 2022 May;36(5):108186. doi: 10.1016/j.jdiacomp.2022.108186. Epub 2022 Mar 29. PMID: 35379538.
- Starosta A, Gordon CE, Hornstein MD. Predictive factors for intrauterine insemination outcomes: a review. Fertil Res Pract. 2020 Dec 11;6(1):23. doi: 10.1186/s40738-020-00092-1. PMID: 33308319; PMCID: PMC7731622.
- 14. Spencer L, Rollo M, Hauck Y, MacDonald-Wicks L, Wood L, Hutchesson M, Giglia R, Smith R, Collins C. The effect of weight management interventions that include a diet component on weight-related outcomes in pregnant and postpartum women: a systematic review protocol. JBI Database System Rev Implement Rep. 2015 Jan;13(1):88-98. doi: 10.11124/jbisrir-2015-1812. PMID: 26447010.
- Pimentel VM, Kreditor E, Ferrante A, Figueroa R, Wakefield DB, Crowell R. Perception of the impact of maternal weight on pregnancy outcomes in overweight and obese women. J Matern Fetal Neonatal Med. 2022 Dec;35(26):10676-10684. doi: 10.1080/14767058.2022.2155038. Epub 2022 Dec 12. PMID: 36510343.
- 16. Rolfo A, Nuzzo AM, De Amicis R, Moretti L, Bertoli S, Leone A. Fetal-Maternal Exposure to Endocrine Disruptors: Correlation with Diet Intake and Pregnancy Outcomes. Nutrients. 2020 Jun 11;12(6):1744. doi: 10.3390/nu12061744. PMID: 32545151; PMCID: PMC7353272.
- Azher S, Pinheiro JMB, Philbin B, Gifford J, Khalak R. The Impact of Maternal Obesity on NICU and Newborn Nursery Costs. Front Pediatr. 2022 May 18;10:863165. doi: 10.3389/fped.2022.863165.
  PMID: 35664876; PMCID: PMC9157567.
- Segovia SA, Vickers MH, Reynolds CM. The impact of maternal obesity on inflammatory processes and consequences for later offspring health outcomes. J Dev Orig Health Dis. 2017 Oct;8(5):529-540. doi: 10.1017/S2040174417000204. Epub 2017 Mar 27. PMID: 28343461.
- Tranquilli AL. The impact of maternal obesity on hypertension and other adverse outcomes in pregnancy. J Hypertens. 2011 May;29(5):834-5. doi: 10.1097/HJH.0b013e3283462ca9. PMID: 21475045.
- 20. Tersigni C, Neri C, D'Ippolito S, Garofalo S, Martino C, Lanzone A, Scambia G, Di Simone N. Impact of maternal obesity on the risk of preterm delivery: insights into pathogenic mechanisms. J Matern Fetal Neonatal Med. 2022 Aug;35(16):3216-3221. doi: 10.1080/14767058.2020.1817370. Epub 2020 Sep 17. PMID: 32942918.



- Brodowski L, Rochow N, Yousuf EI, Kohls F, von Kaisenberg CS, Berlage S, Voigt M. The impact of parity and maternal obesity on the fetal outcomes of a non-selected Lower Saxony population. J Perinat Med. 2021 Oct 26;50(2):167-175. doi: 10.1515/jpm-2020-0614. PMID: 34695308.
- 22. Santangeli L, Sattar N, Huda SS. Impact of maternal obesity on perinatal and childhood outcomes. Best Pract Res Clin Obstet Gynaecol. 2015 Apr;29(3):438-48. doi: 10.1016/j.bpobgyn.2014.10.009. Epub 2014 Nov 1. PMID: 25497183.
- 23. Lawand G, Minisha F, Yaqoub SA, Al Dewik N, Al Rifai H, Farrell T. The impact of abnormal maternal body mass index during pregnancy on perinatal outcomes: a registry-based study from Qatar. J Perinat Med. 2023 Aug 24;51(9):1197-1205. doi: 10.1515/jpm-2023-0198. PMID: 37615070.
- 24. Hart TL, Petersen KS, Kris-Etherton PM. Nutrition recommendations for a healthy pregnancy and lactation in women with overweight and obesity - strategies for weight loss before and after pregnancy. Fertil Steril. 2022 Sep;118(3):434-446. doi: 10.1016/j.fertnstert.2022.07.027. Epub 2022 Aug 30. PMID: 36050124.
- 25. Fowden AL, Camm EJ, Sferruzzi-Perri AN. Effects of Maternal Obesity On Placental Phenotype. Curr Vasc Pharmacol. 2021;19(2):113-131. doi: 10.2174/1570161118666200513115316. PMID: 32400334.
- 26. Kankowski L, Ardissino M, McCracken C, Lewandowski AJ, Leeson P, Neubauer S, Harvey NC, Petersen SE, Raisi-Estabragh Z. The Impact of Maternal Obesity on Offspring Cardiovascular Health: A Systematic Literature Review. Front Endocrinol (Lausanne). 2022 May 20;13:868441. doi: 10.3389/fendo.2022.868441. PMID: 35669689; PMCID: PMC9164814.
- Pfaller B, Siu SC, D'Souza R, Wichert-Schmitt B, Kumar Nair GK, Haberer K, Maxwell C, Silversides CK. Impact of Obesity on Outcomes of Pregnancy in Women With Heart Disease. J Am Coll Cardiol. 2021 Mar 16;77(10):1317-1326. doi: 10.1016/j.jacc.2021.01.010. PMID: 33706874.
- Alkhatib B, Salimi S, Jabari M, Padmanabhan V, Vyas AK. Impact of Adverse Gestational Milieu on Maternal Cardiovascular Health. Endocrinology. 2023 Apr 17;164(6):bqad060. doi: 10.1210/endocr/bqad060. PMID: 37042476; PMCID: PMC10164662.
- Furigo IC, Dearden L. Mechanisms mediating the impact of maternal obesity on offspring hypothalamic development and later function. Front Endocrinol (Lausanne). 2022 Dec 22;13:1078955. doi: 10.3389/fendo.2022.1078955. PMID: 36619540; PMCID: PMC9813846.
- 30. Ramji N, Quinlan J, Murphy P, Crane JM. The Impact of Maternal Obesity on Breastfeeding. J Obstet Gynaecol Can. 2016 Aug;38(8):703-11. doi: 10.1016/j.jogc.2016.03.013. Epub 2016 May 28. PMID: 27638980.