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Factores de riesgo de la obesidad en el embarazo

Risk factors for obesity in pregnancy

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Palabras claves:
Obesidad, Embarazo, Materno-Fetal, Prevención.

Resumen

Introducción: La obesidad durante el embarazo representa un desafío significativo para la salud materno-fetal, con implicaciones que van más allá de la gestación misma. Este fenómeno ha suscitado creciente atención debido a sus consecuencias adversas tanto para la madre como para el desarrollo del feto. Identificar los factores de riesgo asociados a la obesidad durante el embarazo es esencial para comprender mejor esta problemática y abordarla de manera efectiva. **Objetivo:** Identificar los factores de riesgos de obesidad durante el embarazo. **Metodología:** El desarrollo de este estudio se basa en la investigación cualitativa con enfoque analítico de fuentes de información ya existentes, como libros, artículos científicos, revistas, tesis, informes y otros documentos. Este enfoque de investigación se centra en la recopilación, revisión y síntesis de la literatura disponible sobre un tema o problema de investigación específico. **Resultados:** La conexión entre la obesidad materna y el riesgo de obesidad en los hijos, revelando un patrón de transmisión de la obesidad de la madre a la descendencia. Además, se destaca el impacto negativo de la obesidad materna en la prevalencia de discapacidad intelectual en los hijos, subrayando la necesidad de abordar la salud materna como una medida preventiva para los riesgos de salud en los niños. **Conclusión:** La investigación logró identificar diversos factores de riesgo asociados a la obesidad durante el embarazo. Entre ellos, se destacan la incidencia de ciertos niveles educativos y de ingresos, así como la ubicación geográfica y el estado civil, como elementos que contribuyen significativamente a la presencia de obesidad en mujeres embarazadas. **Área de estudio general:** Medicina. **Área de estudio específica:** Enfermería.

Keywords:
Obesity, Pregnancy, Maternal-Fetal, Prevention.

Abstract

Introduction: Obesity during pregnancy represents a significant challenge for maternal-fetal health, with implications that go beyond gestation itself. This phenomenon has attracted increasing attention due to its adverse consequences for both the mother and the developing fetus. Identifying the risk factors associated with obesity during

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pregnancy is essential to better understand this problem and address it effectively. Objective: To identify the risk factors for obesity during pregnancy. Methodology: The development of this study is based on qualitative research with an analytical approach to existing sources of information, such as books, scientific articles, journals, theses, reports, and other documents. This research approach focuses on the collection, review, and synthesis of the available literature on a specific research topic or problem. Results: The connection between maternal obesity and the risk of obesity in offspring, revealing a pattern of transmission of obesity from mother to offspring. In addition, the negative impact of maternal obesity on the prevalence of intellectual disability in offspring is highlighted, underlining the need to address maternal health as a preventive measure for health risks in children. Conclusion: The research was able to identify several risk factors associated with obesity during pregnancy. Among them, the incidence of certain educational and income levels, as well as geographic location and marital status, stand out as elements that contribute significantly to the presence of obesity in pregnant women.

Introduction

The development of this article refers to the risk factors for obesity in pregnancy, for which different antecedents have been analyzed, as mentioned by Zou et al. (2022) on the topic: "Association between weight gain during the first half of pregnancy and the risk of hypertensive disorder of pregnancy" carried out in Hong Kong, China, in which the objective was established; to analyze the relationship of weight gain in the first half of pregnancy and the risk of hypertensive disorder. Based on the methodology applied, it was based on a quantitative study with a prospective approach in which 9,805 pregnant women with an average age of 30-34 years were included. The data collection process was based on questionnaires where the weight, height and blood pressure of the participants were measured. Regarding the results, three weight categories were observed: underweight, normal weight and overweight/obesity. Of these women, 5.2% were diagnosed with gestational hypertension (HDP). The incidence of HDP increased progressively in the underweight (1.8%), normal weight (3.9%) and overweight/obese

(12.2%) groups. In conclusion, this analysis suggests a potential relationship between body mass index and the incidence of HDP during pregnancy.

In reference to the study carried out in Mexico City by Ziauddeen et al. (2019), based on "Maternal weight gain between pregnancies is associated with the risk of large births for gestational age" in which the objective was to analyze maternal overweight and obesity and the risk of birth for gestational age and childhood obesity. In reference to the methodology applied, it was based on a quantitative study with a population cohort approach. In reference to the results, in a sample of 40 women, 16.0% experienced weight loss, while 47.7% gained weight (≥1 kg/m2) between pregnancies. The incidence of babies with excessive fetal growth (LGA) varied according to changes in maternal weight, being lower in women who lost weight and maintained their weight stable, and higher in obese women who gained ≥3 kg/m2. In conclusion, the study reveals interesting associations between changes in maternal weight between pregnancies and the incidence of LGA babies. Weight loss was associated with a lower proportion of LGA, especially in overweight women.

According to Zhu et al. (2023), in a study based on "Association between gestational weight gain and preterm and postterm birth" carried out in Mexico City, in which the general objective has been established to evaluate the association between gestational weight gain and preterm birth. Based on the methodology, it was based on a longitudinal study where 100 to 122 pregnant women were analyzed with different standardized analyses, different stratified methods were applied to obtain the information. In reference to the results, 9.45% experienced preterm birth and 4.54% experienced postterm birth. The findings indicate that low and high pregnancy weight gain (GWG) scores are positively associated with preterm birth. In turn, low scores are associated with a higher risk of postterm birth, while high scores are associated with a lower risk. Both low and high scores are linked to adverse outcomes. In women with body mass index (BMI) and obesity, pre-pregnancy BMI and low GWG scores are associated with a lower risk of preterm birth. In conclusion, the evidence obtained indicates that the management of weight gain during pregnancy (GWG) could represent a significant strategy to decrease both the incidence of preterm birth and post-term birth.

Regarding the problem of study, it is determined that women who are obese and are in the gestation period face a number of problems and risks that affect their health, as well as being at risk of hypertension, gestational diabetes mellitus and a high risk of having a cesarean delivery. It is also important to indicate that women who have gestational diabetes have a high rate of developing obesity or being overweight (Cordero et al., 2019). For this reason, the following question arises; What are the risk factors for obesity in pregnancy?

Fetuses also develop complications when women are in a period of obesity, they have a higher risk of problems that affect their health, where several cases have been determined that are related or linked to obesity and overweight, likewise in these cases according to the analyzes there is a 15% -20% that newborns have heart problems (Soca et al., 2020). Diabetes can also cause a serious problem in the baby, where cases of newborn patients with hypoglycemia may occur, various injuries that can occur during the delivery process, as well as hyperbilirubinemia that cause other health risk factors. In the cases of children of mothers who had gestational diabetes, they have a high level of risk of developing obesity or type II diabetes in the development of their life (Ayabe, 2023).

At a social level, it has been determined that obesity has increased considerably in cases, being these at a global level, it has been shown that 38% of people between 25-65 years old are overweight, and 15% are obese. The majority of the world's population has problems with these diseases, until a report from 2019 identified that more than 42.5 million children under 5 years of age worldwide had problems with being overweight, due to these levels of obesity, the American Congress of Obstetricians and Gynecologists recommends that pregnant women should take advice from a nutritionist or dietitian.

This development is important to analyze because this problem affects thousands of pregnant women globally. Obesity not only affects the pregnant woman, but also has a high incidence on the fetus, in addition to affecting fertility in women. This study is justified because in our country there is 60% of the population with obesity problems, for this reason, this study aims to analyze the risk factors that are present in pregnant women with obesity and overweight, in addition to mentioning the importance of the knowledge analyzed about the pathology, as well as the way of its prevention and adequate treatment (Saiz, 2021).

Aim

General Objective*:* identify risk factors for obesity during pregnancy.

*Specific Objectives:*To determine the incidence of pregnant women with obesity problems. To establish the average weight and gestational age of newborns in women with obesity.obesity and analyze the type of delivery in pregnant women with obesity.

Methodology

According to the type of research, bibliographic research is a type of research that is based on the analysis and study of existing sources of information, such as books, scientific articles, journals, theses, reports and other documents. This research approach focuses on the collection, review and synthesis of available literature on a specific research topic or problem. The main objective of bibliographic research is to explore, analyze and understand the state of existing knowledge on a particular topic. When conducting

bibliographic research, the aim is to identify the relevant theories, concepts, methodological approaches and findings that have been previously published on the topic of interest.(Gomez et al., 2018).

The research method is qualitative, it is used to understand and explore phenomena from a subjective perspective, focusing on the interpretation and meaning that individuals attribute to their experiences. Through this research process, studies published through articles and journals such as Scielo, PubMed, Elsevier, which are the most recognized, have been considered, and which only take into consideration studies carried out from 2018 onwards. Articles published before 2018 and which have no relation to the main topic or link to any of the variables have not been considered for this study.

The indexed journals of PubMed and Scielo were taken into consideration. For this analysis, information or documents from unreliable websites and sites such as rincón del vago, Wikipedia, among others, were excluded. This study allows us to obtain more extensive information and analyze the situation regarding risk factors for folate deficiency in pregnant women.

Results

The study reveals that there is a significant association between maternal obesity and the risk of obesity in children, with a percentage of 17.8%, indicating a pattern of transmission of obesity from mother to child. In addition, it is highlighted that maternal obesity has a negative impact on the prevalence of intellectual disability in children, highlighting the importance of addressing maternal health to prevent health risks in children. These findings are crucial when designing public health strategies and intervention programs during pregnancy. Regarding the factors associated with excessive weight gain during pregnancy (EGWG), seventy studies were identified that addressed 58 factors, classified into three categories: individual, family and social.

Table 1

Determine the incidence of pregnant women with obesity problems

Author/Year	Qualification	Sample	Methodology	Results
Zhu et al. (2019) New York	Impact of pre-pregnancy maternal body mass index on cognitive and metabolic profiles of singletons born after in vitro fertilization/intracytoplasmic sperm injection	74 pregnant women with overweight and obesity	It is based on a quantitative study with a cohort study approach.	The study highlights that the association between maternal obesity and the risk of obesity in children is 17.8%, evidencing a pattern of transmission of obesity from mother to child. In addition, a negative impact of maternal obesity is observed on the prevalence of intellectual disability in children, underlining the importance of addressing maternal health in the prevention of health risks for children. It is relevant to consider these results when developing public health strategies and intervention programs during pregnancy.
Zhou et al. (2022b) Beijing	Determinants of excessive gestational weight gain	70 study based on factors in pregnant women	Qualitative study with analytical approach and bibliographic review	Seventy studies were examined to identify factors associated with excessive pregnancy weight gain (EGWG) in women. The review addressed 58 factors classified into three categories: individual (37 factors in 7 aspects), family (8 factors in 4 aspects), and social (13 factors in 4 aspects). A combined analysis of 13 factors, which included individual, family, and social aspects, showed that prepregnancy overweight, younger age, unemployment,

				primiparity, smoking, and single (including divorced) marital status increased the risk of EGWG.

Table 1

Determine the incidence of pregnant women with obesity problems (continued)

Author/Year	Qualification	Sample	Methodology	Results
Zhou et al. (2022a) Hubei	Maternal prepregnancy body mass index, gestational weight gain, and pubertal timing in daughters: a systematic review and meta-analysis of cohort studies	12 cohort studies	Literature review of databases PubMed, ScienceDirect	Compared with normal maternal weight before pregnancy, the presence of general overweight/obesity, obesity and overweight before pregnancy is significantly linked to an increased risk of daughters experiencing puberty at an earlier stage. Daughters born to mothers with general overweight/obesity, obesity and overweight before pregnancy exhibit about 67.4% of an earlier pubertal onset compared to those born to mothers with normal weight.
Zheng et al. (2019b) Hong Kong	Gestational weight gain and pregnancy complications in a high-risk, racially and ethnically diverse population	58 pregnant women	Mixed type study with a descriptive approach	Of the 58 women screened, more than 50% met the IOM's criteria for excessive weight gain during pregnancy. Those women who experienced more than the recommended weight gain were 1.8 times more likely to develop preeclampsia and 1.6 times more likely to have gestational diabetes compared with those who maintained adequate weight gain. There was no significant change in the odds of cesarean delivery.

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Table 1

Determine the incidence of pregnant women with obesity problems (continued)

Author/Year	Qualification	Sample	Methodology	Results
Zheng et al. (2019a) Hubei	Metabolic factors of early pregnancy associated with gestational diabetes mellitus in normal-weight women with polycystic ovary syndrome	56 pregnant women with obesity	Mixed study with a descriptive, analytical approach	The results obtained in this initial phase were subsequently confirmed in a separate cohort study that included 56 participants, of whom 33 had PCOS and 23 did not.

The analysis of the results reveals several significant associations between maternal health and health risks for children. Firstly, the clear relationship between maternal obesity and increased risk of obesity in children is highlighted, indicating a pattern of transmission of obesity from mother to child. This finding underlines the importance of addressing maternal obesity as a risk factor for child health. Furthermore, a negative impact of maternal obesity on the prevalence of intellectual disability in children is observed. Pre-pregnancy overweight, younger age, unemployment, first-time motherhood, smoking and single marital status are identified as factors that increase the risk of excessive weight gain during pregnancy. The findings initially obtained in a sample were confirmed in a larger cohort study, strengthening the validity and applicability of the results.

Table 2

To establish the average weight and gestational age of newborns in women with obesity

Author/Year	Qualification	Sample	Methodology	Results
Yeshaw et al. (2020) Ethiopia	Determinants of overweight/obesity among women of reproductive age group in Ethiopia	93 pregnant women of reproductive age group	Quantitative study	Women with different educational levels, such as secondary education (adjusted OR (AOR)=1.48, 1.01, 2.18) and higher education (AOR=1.78, 1.13, 2.81), as well as those with higher economic level, measured by wealth (AOR=1.85, 1.15, 2.98) and wealth index (AOR=3.23, 1.98, 5.29), showed a higher probability of developing overweight and obesity.

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Table 2

Establishing the average weight and gestational age of newborns in women with obesity (continued)

Author/Year	Qualification	Sample	Methodology	Results
				Likewise, women who lived in urban areas (AOR=4.46, 2.89, 6.87), were married (AOR=1.79, 1.21, 2.64), widowed (AOR=2.42, 1.41, 4.15), divorced (AOR=1.84, 1.13, 3.00), and were between 25 and 49 years old also had higher probabilities in this aspect.
Ting et al. (2022) Hubei	Association between pre-pregnancy overweight/obesity and pregnancy outcomes in women with polycystic ovary syndrome	31 pregnant women included in 14 retrospective cohort studies	Quantitative study with a descriptive approach	Pooled analysis indicated a significantly increased likelihood of miscarriage in women with polycystic ovary syndrome (PCOS) who had a prepregnancy body mass index (BMI) classified as overweight (OR 1.71 [95% CI 1.38-2.11]) or obese (OR 2.00 [95% CI 1.38-2.11]), under a random-effects model. Tests for subgroup differences revealed that the increased risk was consistent regardless of the BMI threshold used to define overweight (24 or 25 kg/m^2) or obese (28 or 30 kg/m^2). Furthermore, women in the control group were found to have significantly more live births compared with those with PCOS and pre-pregnancy overweight/obesity (OR 0.79 [95% CI 0.71-0.89], OR 0.78 [95% CI 0.67-0.91]).

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Table 2

Establishing the average weight and gestational age of newborns in women with obesity (continued)

Author/Year	Qualification	Sample	Methodology	Results
Sultana et al. (2019) Bangladesh	Socioeconomic correlates of overweight and obesity among ever-married urban women in Bangladesh	71 pregnant women	Quantitative study with a descriptive approach	The likelihood of experiencing overweight and obesity among older women in the survey (40-49 years) was 4.3 times higher (OR = 4.3, 95% CI: 2.1-8.8) compared to younger women (15-19 years). Those women with a higher economic level were 4.1 times more likely (OR = 4.1, 95% CI: 2.5-6.7) to be overweight and obese compared to the reference group of women with lower resources. Women with higher education (OR = 1.7, 95% CI: 1.0-2.6) showed a higher propensity to be overweight and obese. However, those women who were not currently living with their husband or were separated from him were less likely (OR = 0.4, 95% CI: 0.2-0.8) to be overweight and obese.
Strauss et al. (2021) Berlin	Obesity in pregnant women: a 20-year analysis of the German experience	51 mothers corroborated in the study	Analytical study with a descriptive approach	The body mass index (BMI) of mothers increased significantly over the period of investigation. In this increase in average periconceptional body weight (from 67.6 to 72.0 kg), the group of obese women experienced a disproportionate increase, averaging from 9.4 to 19.2%. Despite the general trend towards giving birth at older ages (mean maternal age 29.3 years versus 30.7 years), it was not advanced maternal age that influenced the constant increase in maternal weight, but parity.

Table 2

Establishing the average weight and gestational age of newborns in women with obesity (continued)

Author/Year	Qualification	Sample	Methodology	Results
Rodriguez et al. (2022) Belo Horizonte	Environmental and individual factors associated with gestational weight gain.	56 pregnant women with deliveries	Quantitative study with a retrospective approach	Excessive gestational weight gain (GWG) was observed in 36.4% of pregnant women, while GWG was below the recommended range in 22.7%. Regarding excessive GWG, a positive correlation was observed with the number of establishments offering a variety of foods in the vicinity of the place of residence, the pre-pregnancy body mass index in the overweight and obesity categories, the presence of high blood pressure, and the choice of the private sector as the predominant place for prenatal consultations.

The analysis of the results highlights several significant associations between socioeconomic and demographic factors and the prevalence of overweight and obesity in pregnant women. Women with higher educational levels and higher economic status were more likely to develop overweight and obesity. The relationship between PCOS and the risk of spontaneous abortion remained constant, regardless of the BMI thresholds used to define overweight or obesity. Regarding age, older women (40-49 years) were found to be considerably more likely to experience overweight and obesity compared to younger women (15-19 years). Despite the tendency to give birth at older ages, parity, and not advanced maternal age, influenced the consistent increase in maternal weight.

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Table 3

Analyze the type of delivery in pregnant women with obesity

Author/Year	Qualification	Sample	Methodology	Results
Borghesi et al. (2019) Lille	Risk of cesarean delivery among pregnant women with class III obesity	345 pregnant women in labor	Retrospective study with analytical approach to clinical records	In a group of 345 eligible women, 87.2% (301 women) chose to attempt vaginal delivery, with success achieved in 70.1% (211 women), whereas 29.9% (90 women) ended up having a cesarean section. Those who underwent cesarean section after a trial of labor had a higher frequency of nulliparity (71.1%) compared with those who had a vaginal delivery (27.0%; P < 0.001). Furthermore, induction of labor was more common in those who ultimately had a cesarean section (67.8% vs 45.5%; P < 0.001). Multivariate analysis revealed that induction of labor was an independent predictor of cesarean section among women attempting vaginal delivery (odds ratio [OR] 2.30, 95% confidence interval [CI] 1.25-4.22), whereas history of vaginal delivery acted as a protective factor (OR 0.08, 95% CI 0.04-0.17).

Table 3

Analyzing the type of delivery in pregnant women with obesity (continued)

Author/Year	Qualification	Sample	Methodology	Results
Zoorob et al. (2020) kyiv	Maternal morbidity associated with the type of skin incision at cesarean delivery in obese patients	94 pregnant patients in labor were used	Mixed study with descriptive approach	A total of 94 patients met the criteria. Transverse skin incision was associated with a lower rate of cesarean delivery compared with vertical skin incision. The pooled risk ratio for cesarean delivery was 0.47 (95% CI: 0.37–0.58; P < .00001).
Wojtyla et al. (2021) Poznan	Perinatal outcomes in a population of diabetic and obese pregnant women	62 obese pregnant women	Quantitative study with a comparative-descriptive approach	In 2012 and 2017, obese women accounted for 5.5% and 7.5%, respectively, of the study population. During both periods, gestational diabetes mellitus (GDM) was the most common type of glucose intolerance among women with pregnancies complicated by diabetes (2012: 89% vs. 2017: 85.6%). Although a non-significant increase in the rate of induced labor was recorded in the obese group (2012: 9.9% vs. 2017: 11.7%), a significant decrease in fetal birth weight was observed (2012: 3565 g vs. 2017: 3405 g, p < 0.05).

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Table 3

Analyzing the type of delivery in pregnant women with obesity (continued)

Author/Year	Qualification	Sample	Methodology	Results
Trahan et al. (2023) New York	Obstetric and neonatal outcomes among pregnancies complicated by hyperparathyroidism	368 pregnant women with hyperparathyroidism	Retrospective cohort study with data from medical records	Women with hyperparathyroidism were older and had more comorbidities, including obesity, hypertension, and pregestational diabetes. Compared with the control group, these women had an increased risk of preterm birth (OR 1.69, 95% CI 1.24–2.29), preeclampsia (OR 3.14, 95% CI 2.30–4.28), and cesarean delivery (OR 1.69, 95% CI 1.36–2.09). Furthermore, infants born to mothers with hyperparathyroidism showed an increased risk of growth restriction (OR 1.83, 95% CI 1.08–3.07) and of being diagnosed with congenital anomalies (OR 4.21, 95% CI 2.09–8.48).

Table 3

Analyzing the type of delivery in pregnant women with obesity (continued)

Author/Year	Qualification	Sample	Methodology	Results
Poblete & Olmos (2021)	Obesity and gestational diabetes in the care and clinical practice of pregnant women	Study of 18 articles from PubMed, Scielo, Elsevier journals	Qualitative study with an analytical approach	Children of obese women face an increased risk of obstetric complications, as well as developing childhood obesity and long-term metabolic problems. In turn, gestational diabetes (GDM) increases the chances of preeclampsia, cesarean section, and subsequently, up to 50% of women may develop type 2 diabetes. From a fetal perspective, GDM increases the risk of macrosomia, large-for-gestational-age fetuses, shoulder dystocia, and birth injuries.

In a group of 345 women, 87.2% opted for vaginal delivery, with a success rate of 70.1%, while 29.9% had a cesarean section. Women with nulliparity and those who underwent induction of labor were more likely to have a cesarean section. A review of ten publications showed that transverse skin incision was associated with a lower rate of cesarean section compared with vertical skin incision, with a pooled risk of 0.47. Between 2012 and 2017, obese women accounted for 5.5% to 7.5% of the study population. Although there was a nonsignificant increase in induced labor rates, a significant decrease in fetal birth weight was observed. GDM was the most common type of glucose intolerance in women with pregnancies complicated by diabetes.

Discussion

According to the results analyzed in Table 1, it highlights the connection between maternal obesity and the risk of obesity in children, revealing a pattern of transmission of obesity from mother to offspring (Zhu et al., 2023). In addition, the negative impact of maternal obesity on the prevalence of intellectual disability in children is highlighted, underlining the need to address maternal health as a preventive measure for health risks

in children. These findings have significant implications for the design of public health strategies and intervention programs during pregnancy.

In the study on factors linked to excessive weight gain during pregnancy (EGWG), 58 factors were identified, grouped into three categories: individual, family, and social. The combined analysis of these factors showed that aspects such as overweight before pregnancy, younger age, unemployment, primiparity, smoking, and single marital status increase the risk of EGWG (Zhou et al., 2022a). This knowledge can inform intervention strategies aimed at reducing the risk of EGWG in pregnant women. In relation to pubertal onset in daughters of mothers with different weight conditions before pregnancy, a significant association is evident between maternal overweight/obesity and earlier pubertal onset in daughters. These results highlight the importance of considering maternal health as a factor that can affect the pubertal development of daughters.

Referring to Table 2 regarding socioeconomic and demographic factors associated with overweight and obesity in women, it is observed that higher educational levels, higher economic level and residence in urban areas are linked to a higher probability of developing overweight and obesity in what it indicates (Yeshaw et al., 2020). In addition, marital status, age and other demographic factors also influence this relationship. These findings highlight the complexity of the social determinants of health and underline the importance of considering these factors when designing interventions to prevent overweight and obesity in women (Ting et al., 2022). Regarding polycystic ovary syndrome (PCOS) and its relationship with body mass index (BMI) before pregnancy, a significant increase in the spontaneous abortion rate is evident in women with PCOS and overweight or obesity. These results suggest a connection between the hormonal condition of PCOS and obesity, which may have important implications for the clinical management of women with PCOS and their reproductive health.

Analysis of older women in the survey reveals a significant association between age and risk of overweight and obesity. Furthermore, economic factors, such as higher levels of wealth, and higher education are also associated with a higher risk of overweight and obesity in this group of women (Sultana et al., 2019). These results emphasize the importance of considering health disparities across different demographic groups when addressing obesity. The evolution of maternal body mass index (BMI) over time shows a significant increase, especially among obese women. This finding highlights the need for preventive interventions throughout life, not just during pregnancy. Furthermore, parity, rather than advanced maternal age, appears to influence this consistent increase in maternal weight (Strauss et al., 2021).

Based on the results in Table 3, in the analysis of delivery in a group of 345 women, it is highlighted that a large proportion (87.2%) opted for vaginal delivery, achieving success in 70.1%, while 29.9% ended in cesarean section (Borghesi et al., 2019). Women who

experienced a cesarean section after a trial of labor had a higher frequency of nulliparity and a higher incidence of labor induction compared to those who had a vaginal delivery. For their part, Zoorob et al. (2020), in the multivariate analysis reveals that labor induction was an independent predictor of cesarean section, while a history of vaginal delivery acted as a protective factor. These results highlight the complexity of the factors that influence the type of delivery and suggest the need to carefully evaluate the need for labor induction.

In the systematic review of ten publications with 2,946 patients, transverse skin incision is found to be associated with a significantly lower rate of cesarean sections compared with vertical skin incision (Wojtyla et al., 2021). This finding suggests that the choice of incision may influence the cesarean section rate, which could have implications for clinical practice and surgical decisions. Regarding the population of obese women, an increase in prevalence from 5.5% to 7.5% is observed between 2012 and 2017. Gestational diabetes mellitus (GDM) was the most common form of glucose intolerance in women with pregnancies complicated by diabetes in both periods. Although no significant increase in the rate of induced labors was recorded in obese women, a significant decrease in fetal birth weight was observed. These results suggest that maternal obesity may be associated with changes in perinatal outcomes and highlight the importance of managing gestational diabetes in obese women during pregnancy.

In the study of women with hyperparathyroidism by Trahan et al. (2023), these women, who also had obesity and other comorbidities, were found to be at increased risk for obstetric complications, such as preterm birth, preeclampsia, and cesarean delivery. Furthermore, infants born to mothers with hyperparathyroidism were more likely to experience restricted growth and congenital anomalies. These findings underscore the importance of addressing preexisting maternal comorbidities to improve obstetric and neonatal outcomes. In the discussion of children of obese women, their increased risk for obstetric complications and for developing childhood obesity and long-term metabolic problems is highlighted. Gestational diabetes (GDM) is identified as a risk factor contributing to these complications, highlighting the need for appropriate prenatal care in obese women to reduce risks to the mother and child.

Conclusions

- The research identified several risk factors associated with obesity during pregnancy. Among them, the incidence of certain educational and income levels, as well as geographic location and marital status, stand out as elements that significantly contribute to the presence of obesity in pregnant women.
- A significant incidence of obesity was found among pregnant women in the study, revealing the relevance and magnitude of the problem in the study population.

These results underline the importance of addressing obesity as a significant concern in the context of maternal-fetal health.

- Women with obesity were found to have newborns with a different average weight and gestational age compared to those without obesity. These findings highlight the influence of maternal obesity on perinatal outcomes and underline the need for targeted interventions to improve health outcomes in this population.
- The research looked in detail at the type of delivery in women with obesity, revealing specific patterns and trends. Women with obesity were found to have a different frequency of delivery compared to those with a normal body mass index. These results provide valuable information for clinical decision-making and planning of prenatal care in women with obesity.

Conflict of interest

The authors of the article indicate that there is no conflict of interest.

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