

# Eating disorder in pregnancy: Pregorexia

## Gebelikte yeme bozukluğu: Pregoreksiya

MSc. Meryem Kahrıman<sup>1</sup>, PhD. Assist. Prof. Gizem Köse<sup>2</sup>

<sup>1</sup> Acıbadem Mehmet Ali Aydınlar University, Istanbul, Turkey, meryem.kahrıman@acıbadem.edu.tr

<sup>2</sup> Acıbadem Mehmet Ali Aydınlar University, Istanbul, Turkey

### ABSTRACT

Pregorexia, known as anorexia nervosa in pregnancy, defines pregnant women who limit their food intake and engage in activities that increase energy expenditure to control their weight gain during pregnancy. Skipping meals, avoiding eating, applying compensatory behaviors and body image disorders are common in pregnant women with this eating disorder. Pregnant women in the risk group should be followed up with a multidisciplinary team and their food consumption should be evaluated regularly. Considering the differing physiological processes during pregnancy, the energy and nutrient needs of the pregnant women increase due to the plasma volume enlargement and the decrease in the nutrient stores. Pregnant women with eating disorders should be supported in terms of nutrition and nutrients. Not only during pregnancy but also after birth, the mother's caregiving process and the effects on health of the baby should be considered. However, the lack of a tool developed for the diagnosis of pregorexia causes many deficiencies in the definition and management of the disease. Therefore, there is a need for further research on this subject.

### ÖZ

Gebelik anoreksiya nervozası olarak bilinen pregoreksiya, gebelik döneminde ağırlık kazanımını kontrol etmek için besin alımını kısıtlayan ve enerji harcamasını artırıcı faaliyetlere başvuran gebeleri tanımlamaktadır. Bu yeme bozukluğunu yaşayan gebelerde öğün atlama, yemek yemekten kaçınma, telafi edici davranışlara başvurma ve beden imajı bozukluklarının yaygın olduğu bildirilmektedir. Risk grubundaki gebelerin mutlaka multidisipliner bir ekiple takip edilmesi, besin tüketimlerinin düzenli olarak değerlendirilmesi gerekmektedir. Gebelikte değişen fizyolojik süreçler göz önüne alındığında, plazma hacminin artmasına ve gebe kadının depolarının azalmasına bağlı olarak enerji ve besin ögesi ihtiyacı artmaktadır. Yeme bozukluğu olan gebelerin beslenme ve besin öğeleri açısından desteklenmesi gerekmektedir. Yalnızca gebelik sürecinde değil, doğumdan sonra da annenin bebeğe bakım verme süreci ve bu durumun bebek sağlığı üzerindeki etkileri değerlendirilmelidir. Henüz pregoreksiyanın tanısı için geliştirilmiş bir aracın olmaması, hastalığın tanımlanması ve yönetimi konusunda pek çok eksikliğe sebebiyet vermektedir. Bu nedenle bu konu ile ilgili yapılacak araştırmalara ihtiyaç vardır.

**Key Words:**  
Pregnancy; Eating Disorder;  
Gestation; Fetus

**Anahtar Kelimeler:**  
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**Corresponding Author/Sorumlu Yazar:**  
Department of Nutrition and  
Dietetics, Faculty of Health  
Sciences, Acıbadem Mehmet Ali  
Aydınlar University, Istanbul, Turkey

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## INTRODUCTION

### Metabolic and Mental Adaptations in Pregnancy

Pregnancy is a process in which many physiological adaptations occur to support the development of the fetus and prepare the mother for birth. While pregnancy, which is a physiological challenge for many systems in the body, does not cause a significant problem for healthy women, some factors such as gestational age and multiple pregnancy may affect the women's ability to adapt to pregnancy (Soma-Pillay et al., 2016). During this period, changes occur in many systems, especially

in the endocrine, cardiovascular, gastrointestinal, renal, pulmonary, and musculoskeletal systems (Fiat et al., 2022). The basis of physiological adaptations is intravascular volume and compression from the enlarged uterus (Motosko et al., 2017).

Within the scope of endocrine changes during pregnancy, changes occur in metabolisms of carbohydrates, lipids, and proteins. Changes in metabolism are maintaining fetal development while meeting the pregnant women's needs (Angueira et al., 2015). Accordingly, hyperplasia of pancreatic beta cells causes an increase in insulin secretion, which in turn causes increased insulin

sensitivity and resistance (Butte, 2000). Insulin resistance and the resulting hypoglycemia allow pregnant women to use lipids as energy fuel, conserving glucose and amino acids. As a result of increased synthesis and decreased lipoprotein lipase activity in the liver, triglyceride levels increase, which causes a decrease in adipose tissue catabolism (Soma-Pillay et al., 2016).

In addition to adaptations in pregnancy metabolism, enlargement of the uterus and alterations in estrogen and progesterone levels interrupt the gastrointestinal tract and may lead to abnormalities in gastric neural activity, gastric arrhythmia, and gastroparesis. In addition, the bending force of the maternal skeleton to carry fetus and the resistance to biochemical pressures may cause skeletal-muscular system disrupts. Physiological and metabolic changes in pregnancy also affect other systems (Soma-Pillay et al., 2016).

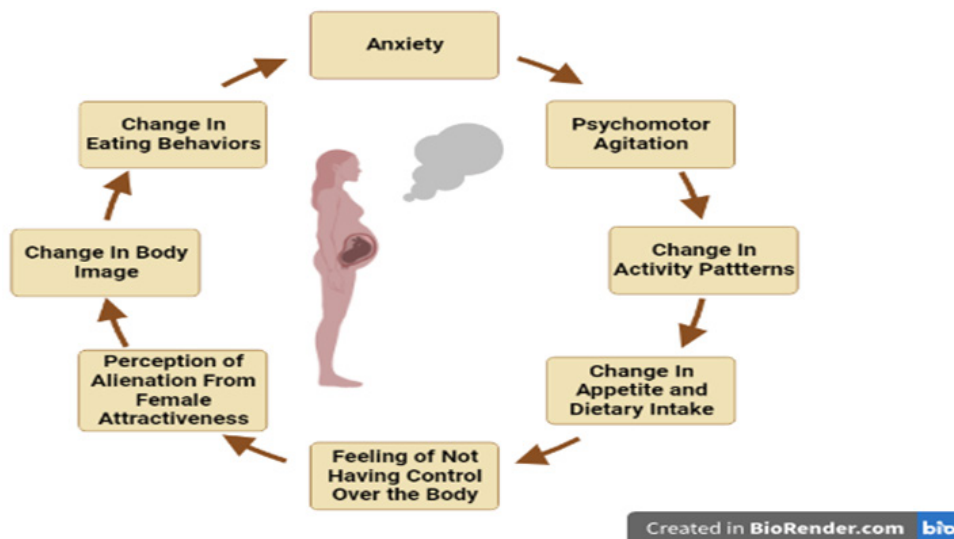
Weight gain during pregnancy is one of the primary changes that occurring and also directs the physiological processes in other systems (Fiat et al., 2022). Therefore, it is important to meet the increasing need for energy and nutrients in order to support the growth and development of the fetus and to manage body weight during pregnancy (ACOG, <https://www.acog.org/womens-health/faqs/nutrition-during-pregnancy>). In addition, mental health may be affected in response to these changes. In the adaptation process to this period, some pregnant women respond with changes in physical activity patterns, appetite, dietary intake plus anxiety, psychomotor agitation. Therefore, mental and physical well-being management of the pregnant women should be evaluated together (Chauhan and Potdar, 2022).

Although weight gain during pregnancy is a normal physiological process, some women perceive it as a feeling of not having control over the body and being away from female attractiveness. In addition, changes in body image and eating behaviors may be encountered in some pregnant women due to social pressures such as media, family, and peers (Figure 1) (Saleem et al., 2022). For this reason, pregnant women can be more vulnerable to eating disorders, considering gestation related eating behavior and body image.

### Pregorexia

Pregorexia term was first used by the media in 2008 to describe ‘women who reduce their energy intake and making exercise excessively for control weight gain in pregnancy’ (Mathieu, 2009). Although it is a notion has been discussing in the literature (Saleem et al., 2022), not yet recognized as an eating disorder in the Diagnostic and Statistical Manual of Mental Disorders-V (DSM-V) (American Psychiatric Association [APA], 2013). However, it has been reported that pregnant women with a previous history of eating disorders, who tend to focus on energy intake instead of gestational health, as well as eat alone, skip meals, and talk about pregnancy as if it is not real, may be in a risk of pregorexia and should be monitored carefully (Mathieu, 2009).

Skipping meals is common in pregnant women with pregorexia and demonstrating different activities such as oversleeping and overwork to avoid eating, compensatory behaviors such as usage of laxative and diuretic, excessive exercise, vomiting are common, body image disruption and body weight concerns (Saleem et al., 2022).



**Figure 1.** Possible effects of body weight change during pregnancy on mental health and eating behavior (Designed in a private account with <https://www.biorender.com/>).

These findings suggest that although there are no defined diagnostic criteria for this eating disorder, anorexia nervosa criteria can be used as a source (Table 1). Besides, atypical anorexia nervosa and orthorexia nervosa (even if it was not included in DSM-V) can be used in the differential diagnosis of pregorexia (Figure 2) (Vasiliu, 2023).

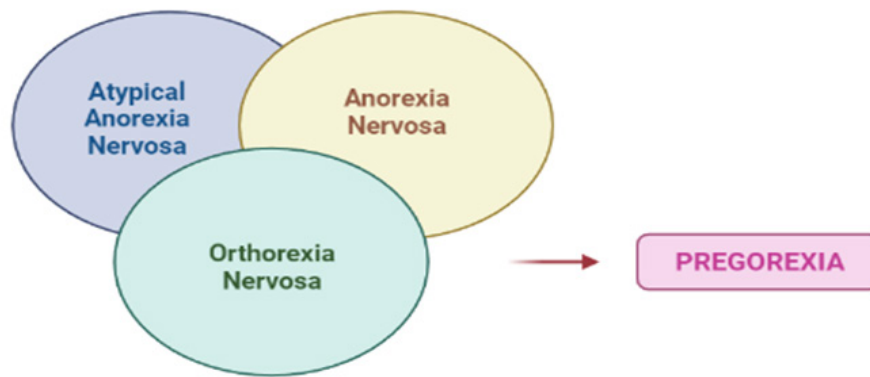
### Epidemiology of Pregorexia

Many risk factors for eating disorders in pregnant women is sex-related. In the literature, it is a known fact that the prevalence of eating disorders is higher in women (Wu et al., 2020). Concerning this matter, pregnant women may have threatened by developing eating disorders due to the female sex factor. Besides, young or smoking women has a higher risk for fear of weight gain or eating disorders during pregnancy (Czech-Szczapa et al., 2015). In addition, the increase in body weight and changes in other metabolic systems

during pregnancy predispose pregnant women such as anxiety and agitation (Fiat et al., 2022). Contrary to non-positive results, pregnancy can improve the symptoms of eating disorders, as the mother shifts her attention to the development and health of the fetus (Vasiliu, 2023). The precise prevalence of pregorexia is still unknown due to the lack of a tool developed for screening in favor of pregorexia (Bye et al., 2020).

### Etiology of Pregorexia

The role of different factors in the etiology of eating disorders, such as exposure to physical or sexual abuse, experiencing an life-changing stressful event, and engaging in aesthetics sports can be observable (Mitchison and Hay, 2014). In addition, the idealization of thinness by the society, exposure to idealized body images presented in the media, body image disruption, and accompanying weight concerns also lead to the development of eating disorders (Keel and Forney, 2013).



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**Figure 2.** Eating disorders that can be used in the differential diagnosis of pregorexia (Designed in a private account with <https://www.biorender.com/>).

**Table 1.** DSM-V Anorexia Nervosa Diagnostic Criteria

A.	Restriction of energy intake relative to requirements, leading to a significantly low body weight in the context of age, sex, developmental trajectory, and physical health. <i>Significantly low weight</i> is defined as a weight that is less than minimally normal or, for children and adolescents, less than that minimally expected.
B.	Intense fear of gaining weight or of becoming fat, or persistent behavior that interferes with weight gain, even though at a significantly low weight.
C.	Disturbance in the way in which one's body weight or shape is experienced, undue influence of body weight or shape on self-evaluation, or persistent lack of recognition of the seriousness of the current low body weight.

In addition, physiological changes during pregnancy also contribute to this situation (Tuncer et al., 2020).

The role of changes in hormonal and neurotransmitter levels during pregnancy is discussed in this eating disorder. A study on this subject emphasized the relationship between estradiol and progesterone levels and depression, and the relationship between high cortisol levels and anxiety (Fan et al., 2009). In addition to these, lactogenic hormones (prolactin and placental lactogen) are important determinants of adaptations during pregnancy. Prolactin can be effective on eating behavior and body weight management (Georgescu et al., 2021). On the other hand, oxytocin is another hormone that plays a role in mother-infant bonding and social communication. Changes in the levels of oxytocin may be associated with postpartum depressive symptoms (Jobst et al., 2016). In addition, plasma epinephrine, serotonin and dopamine levels decrease in healthy pregnant women in every trimester (Shetty and Pathak, 2002). Since all these changes in hormone and neurotransmitter levels are associated with mental well-being and eating behaviors, they are important in elucidating the pathophysiology of pregorexia.

Pregnancy is also a process of physiological and anatomical change. In particular, it is important for the mother have a sufficient energy and nutrient intake and provide appropriate physical activity in order to ensure adequate body weight gain and fetal development (ACOG, <https://www.acog.org/womens-health/faqs/nutrition-during-pregnancy>). However, adaptation to pregnancy meeting the increasing nutritional requirements may vary in every pregnant women. For example in a study about maintaining a healthy lifestyle in pregnant women, they agreed that healthy lifestyle were related to the degree of defining themselves as healthy people. On the other hand, women who are not preoccupied with health are uninterested in talking about their lifestyles (Morris et al., 2020). For this reason, each pregnant woman should be evaluated individually and supported in order to meet the increasing needs.

### **Effects of Pregorexia on Mother and Infant**

Eating disorders have many negative effects on both mother and infant. It affects many systems, including mental and physiological, in the pregnant women. It causes an increase in depressive symptoms and even negatively affects the mother's caregiving process for the baby. The breastfeeding period may be shortened plus the mother-infant communication process can be damaged (Baltacıoğlu and Hocoğlu, 2023). In addition, some pregnant women tend to limit their food intake due to body image and body weight concerns, which may result in nutrient deficiency (Kaiser, L and Allen,

2008). Regarding this situation, eating disorders may result in iron deficiency anemia, hypertension, and obstetric complications in the long term (Baltacıoğlu and Hocoğlu, 2023).

Eating behaviors and habits of pregnant women with eating disorders also endanger the fetus in terms of complications. In addition to restrictive food intake, compensatory behaviors such as laxative and diuretic usage stated as important risk factors (Saleem et al., 2022). Especially, applying to restricted diets is associated with premature birth, low birth weight, microcephaly, and sudden infant deaths (Baltacıoğlu and Hocoğlu, 2023, Keen et al., 2003). Considering the increased risk of complications, identification and management of eating disorders in pregnant women is crucial for both mother and infant.

### **Medical Nutrition Therapy and Management**

During pregnancy, women should be monitored in terms of eating behavior, psychological and physiological development and adaptations. It should be kept in mind that pregnant women who cannot gain the targeted body weight during pregnancy, who show restriction of food intake, who have symptoms of depression, and who experience hyperemesis gravidarum after the 20th week of gestation can be more vulnerable to eating disorder (Hawkins and Gottlieb, 2013). Pregnant women with these risk factors should be directed to a psychiatrist and the treatment should be managed with a multidisciplinary team, alongside evaluations of depression and anxiety development during pregnancy (Mathieu, 2009, Baltacıoğlu and Hocoğlu, 2023). The body weight of the mother should be monitored regularly, and dietary intake should be followed routinely with a food diary (Mathieu, 2009). Pregnant women should be informed about the increased energy and nutrient needs during pregnancy and the effects of these requirements on the normal functioning of pregnancy and the fetus (Baltacıoğlu and Hocoğlu, 2023).

Although the optimal weight gain goal during pregnancy varies according to the pre-pregnancy body mass index (BMI), a pregnant woman with normal BMI should gain 11.5-16 kg. This should not be ignored in a pregnant woman with an eating disorder and should be supported for adequate weight gain (National Research Council, 2009). Although the energy need during pregnancy varies depending on the age, trimester, BMI and physical activity level of the women, additional energy is 300 kcal per day, approximately. Along with the energy, macro and micro nutrients requirements are also elevated. All these conditions should be considered for pregnant women diagnosed with eating disorders (Kominiarek and Rajan, 2016). In addition to macronutrients, vitamins and

minerals play a crucial role in many functions of the body (ACOG, <https://www.acog.org/womens-health/faqs/nutrition-during-pregnancy>). Therefore, it is important to meet this requirement during pregnancy. While meeting this requirement, it should not be ignored that the requirement for nutrients during pregnancy increases compared to normal physiological conditions (Jouanne et al., 2021). Care should be taken to meet the requirements for folic acid, iron, calcium, vitamin D, choline, omega-3 fatty acids, B vitamins and vitamin C (Table 2) (ACOG, <https://www.acog.org/womens-health/faqs/nutrition-during-pregnancy>). Since eating disorders may cause nutrient deficiencies in the long term for pregnant women (Baltacıođlu and Hocaođlu, 2023), adequate consumption of nutritional resources should be ensured before deficiencies occur (ACOG, <https://www.acog.org/womens-health/faqs/nutrition-during-pregnancy>). Moreover, the birth weight of the baby should be evaluated in the postpartum period, and breastfeeding should be supported. The mother's caregiving process for the baby should definitely be followed by health professionals (Baltacıođlu and Hocaođlu, 2023).

## CONCLUSION

Although pregorexia is an eating disorder that has recently been discussed in the literature and the diagnostic tool has not yet been developed, it is obvious that it may affect many pregnant women and this situation affects both mother and infant. Women with eating disorder must be supported in every way by a multidisciplinary team, and advised to have necessary energy and nutritional needs. Furthermore, there is a need for more study in this area in order to develop a diagnostic tool and to manage the treatment more effectively.

**Table 2.** Vitamin and Mineral Requirements During Pregnancy (ACOG, <https://www.acog.org/womens-health/faqs/nutrition-during-pregnancy>)

Mineral / Vitamin	Requirement
Calcium	1,300 milligrams for ages 14 to 18; 1,000 milligrams for ages 19 to 50
Iron	27 milligrams
Iodine	220 micrograms
Choline	450 milligrams
Vitamin A	750 micrograms for ages 14 to 18; 770 micrograms for ages 19 to 50
Vitamin C	80 milligrams for ages 14 to 18; 85 milligrams for ages 19 to 50
Vitamin D	600 International Units
Vitamin B6	1.9 milligrams
Vitamin B12	2.6 micrograms
Folic Acid	600 micrograms

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