



(REVIEW ARTICLE)



Premenstrual syndrome and its association with body composition: A comprehensive review

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Abstract

Premenstrual Syndrome (PMS) is a common condition that affects women of reproductive age. It is characterized by a wide range of physical and psychological symptoms that occur in the luteal phase of the menstrual cycle. This paper aims to provide a comprehensive review of the existing literature on the association between PMS and body composition. The review explores the probable influence of body fat percentage, muscle mass, total body water, hormonal variations, and nutritional factors on the severity and occurrence of PMS symptoms. Understanding the interrelationship between body composition and PMS is crucial for healthcare professionals to support women in managing their symptoms and improving overall well-being.

Keywords: Menstruation; Quality of life; Body composition; Physical activity; Hormonal fluctuations

1. Introduction

Premenstrual Syndrome (PMS) is a collection of physical, emotional, and behavioral symptoms that occur in the days leading up to menstruation. Various factors such as biology of menstruation, hormones and lifestyle are known to cause PMS in women [1]. More than 100 physical and psychological symptoms have been reported to occur during premenstruation. The most common symptoms include mood swings, depression, irritability, abdominal cramps, headache, generalized pain, abdominal bloating, breast swelling and tenderness, and appetite changes [2] and is found to negatively affect the quality of life [3].

Researchers report that the prevalence of PMS symptoms are found in 40–80% of girls and women, while strict diagnostic criteria estimated that 2.5 to 5% of girls and women are affected by PMS and markedly have an impact on their quality of life. Hence, it is necessary to define PMS clearly and develop precise diagnostic criteria [4]. Although the exact cause of PMS remains elusive, research suggests that psychosocial and socio-demographic factors and body composition might play a role in its development and severity. This paper aims to critically review the existing literature on the association between PMS and body composition.

2. Body Composition and PMS

2.1. Body Fat Percentage

The relationship between body fat percentage and PMS symptoms has been investigated by several studies. Some researchers suggest that higher body fat levels could be associated with an increased risk of experiencing severe symptoms of PMS [5]. Adipose tissue is an endocrine organ may contribute to the pathophysiology of PMS through the production of hormones and inflammatory molecules. A study reported that increase in weight, WHR and body fat

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percentage were significantly associated with increased PMS score by the women participants, may be due to leptin, synthesised by the adipose tissue, which plays a role in the gonadotropin regulation. Overweight and obese women with more number of fat cells produce higher levels of leptin and can contribute to the PMS [1, 6]. However, more research is needed to establish a definitive link between body fat and PMS.

2.2. Muscle Mass

The influence of muscle mass on PMS is less studied when compared to body fat. However, it is plausible that muscle mass might impact hormone metabolism and influence PMS symptoms. Physical activity, which is closely related to muscle mass, has been shown to alleviate PMS symptoms in some women, possibly through its effects on hormone regulation and mood enhancement.

2.3. Hormonal Fluctuations

PMS is believed to be linked to fluctuations in sex hormones, primarily oestrogen and progesterone. Reduced progesterone levels during luteal phase of the menstrual cycle leading to lower oestrogen/ progesterone ratio has been linked to the onset of PMS by many investigators. These hormones can influence body composition by affecting muscle mass, fat storage, and fluid retention through sodium retention and potassium-depleting effect [4]. The hormonal changes that occur during the menstrual cycle may contribute to changes in body composition, aggravating PMS symptoms in susceptible individuals.

2.4. Nutritional Factors

Dietary practices and nutritional factors are also known to play a role in the development and severity of PMS symptoms. Hormonal fluctuations in luteal phase are associated with reduced levels of amino acids and lipids leading to physiologically anabolic state and increasing the requirements for energy, which can have an effect on increased premenstrual food craving [6]. A significant association was found between consumption of simple carbohydrate and fat rich foods with the higher risk of PMS.

Intake of protein is also associated with PMS through several physiological mechanisms. An increased protein intake, especially animal origin is linked to raise the levels of oestrogen/estradiol, which may act as a precursor for certain PMS symptoms [7]. Certain nutrients, such as calcium, magnesium, and vitamin D, have been implicated in PMS symptom modulation. Imbalances in these nutrients may be associated with changes in body composition and might contribute to PMS symptomatology.

2.5. Methodological Challenges and Future Directions

The existing research on the association between PMS and body composition has limitations, including small sample sizes, retrospective data collection, and varying definitions of PMS. To advance our understanding, future studies should adopt standardized PMS assessment tools and consider longitudinal designs to capture the dynamic changes in body composition and PMS symptoms throughout the menstrual cycle. Additionally, randomized controlled trials investigating the effects of exercise, nutrition, and body composition interventions on PMS are warranted.

2.6. Clinical Implications

Understanding the association between body composition and PMS has important clinical implications. Healthcare professionals should consider body composition factors when evaluating and managing PMS symptoms in women. Encouraging regular physical activity, maintaining a balanced diet, and addressing any significant changes in body composition might help alleviate PMS symptoms and improve overall well-being.

3. Conclusion

Premenstrual Syndrome is a common condition that affects many women worldwide. While the precise relationship between body composition and PMS remains complex and multifactorial, emerging evidence suggests that body fat percentage, muscle mass, hormonal fluctuations, and nutritional factors may influence the severity and occurrence of PMS symptoms. Further research is necessary to establish a clear association and provide targeted interventions for managing PMS effectively. Enhancing our understanding of the interplay between PMS and body composition will ultimately contribute to better healthcare strategies for women experiencing PMS.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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