

EXPLORING THE ROLE OF DIET IN ALLEVIATING SYMPTOMS OF PREMENSTRUAL SYNDROME [PMS]: A NARRATIVE REVIEW

Romadhinniar Febriana;¹ Dian Sartika;¹ Alcinda Pinto Fernandes;¹ Fany Hardiati Amalia;¹ Frilya Rachma Putri²

Correspondence: niarfeb@student.ub.ac.id

¹Midwifery Master's Degree Program, Faculty of Medicine, Universitas Brawijaya, Indonesia

²Department of Psychiatry, Faculty of Medicine, Universitas Brawijaya- Dr. Saiful Anwar General Hospital, East Java Province, Indonesia

REVIEW

OPEN ACCESS

ABSTRACT

Introduction: Premenstrual Syndrome (PMS) involves physical and emotional symptoms that occur before menstruation, affecting most women of reproductive age. This study aims to review the role of nutrition and dietary interventions in alleviating PMS symptoms, with a focus on calcium, magnesium, vitamin D, and vitamin B6.

Methods: Peer-reviewed articles from the past five years focused on nutrition and PMS. Data sources included PubMed, Google Scholar, and ScienceDirect. Keywords included "PMS," "nutrition/diet," "micronutrients/vitamins/minerals," and "dietary intervention/nutritional therapy." Articles were selected based on relevance and quality.

Results: high intake of calcium, magnesium, vitamin D, and vitamin B6 reduces PMS symptoms. Calcium stabilizes mood and reduces anxiety. Magnesium alleviates pain and bloating. Vitamin D reduces inflammation and regulates immune function, while vitamin B6 supports neurotransmitter synthesis, helping reduce depression and fatigue.

Discuss: High-fiber, low-sugar diets and omega-3 fatty acids from fatty fish also mitigate PMS symptoms. Nutritional interventions effectively manage PMS symptoms. A balanced, nutrient-rich diet should be integral to PMS management.

Conclusion: Nutrition and diet play an important role in alleviating the symptoms of premenstrual syndrome (PMS). High intakes of calcium, magnesium, vitamin D, and vitamin B6 have consistently been proven to reduce various physical and psychological complaints experienced by women during the luteal phase of the menstrual cycle.

Keywords: premenstrual, diet, nutrition.

Article History:

Received: May 27, 2024

Accepted: March 2, 2025

Published: March 31, 2026

Cite this as: Febriana, R. Sartika, D., Fernandes, A.P., Amalia, F.H. Putri, F.R. Exploring the Role of Diet in Alleviating Symptoms of Premenstrual Syndrome [PMS]: a Narrative Review. *Journal of Psychiatry Psychology and Behavioral Research*; 2026.7:1. p19-22.

INTRODUCTION

Premenstrual Syndrome (PMS) is a physical and emotional symptom that appears one or two weeks before menstruation. Almost all women experience some symptoms of PMS, and these symptoms usually disappear after menstruation begins. PMS symptoms can vary from mild to severe and interfere with daily activities.¹

Almost all women of reproductive age experience one or more of the symptoms of premenstrual syndrome. The symptoms experienced vary for each woman and with each menstrual cycle in severity and frequency. The most severe and frequent impact of premenstrual syndrome (PMS) is emotional and

behavioral change. These symptoms can include irritability, depression, anxiety, fatigue, and difficulty concentrating. Apart from that, PMS can also cause discomfort in the breasts, such as swelling and pain. Pain in the abdominal area, such as stomach cramps, is also a common PMS symptom.²

Premenstrual syndrome (PMS) is not only influenced by hormones but can also be influenced by other factors such as age, psychological, social, and biological conditions, and diet can also trigger the appearance of PMS symptoms. Several nutrients, such as certain enzymes, vitamins, and minerals, are considered important and contribute to the emergence of PMS symptoms. Among these minerals, calcium and magnesium are the two most important. Calcium plays a role in many cellular

processes, including gene transcription and muscle contraction. Meanwhile, magnesium plays an important role in muscle contraction, relaxation, neurological function, and neurotransmitter release.³ This nutritional imbalance is considered to aggravate complaints during PMS. However, claims about the role of nutrition in reducing PMS symptoms are still inconsistent. Therefore, this narrative study further explores how nutrition can be used to treat PMS.

METHOD

This study used inclusion criteria such as peer-reviewed journal publications focusing on the relationship between nutrition, diet, and PMS symptoms; studies of human subjects with a diagnosis of PMS; English- or Indonesian-language articles; and articles published in the last 5 years. Exclusion criteria included incomplete articles, animal/laboratory studies, and non-peer-reviewed articles. Data sources included PubMed, Google Scholar, and ScienceDirect, with the keywords “PMS,” “nutrition/diet,” “micronutrients/vitamins/minerals,” and “dietary intervention/nutritional therapy.” Article selection is based on title, abstract, quality, and relevance.

Articles that meet the criteria are selected for analysis by the author. Key findings on the role of nutrition and diet in alleviating PMS symptoms were extracted and synthesized from various studies. These include information about study design, sample size, nutritional interventions, and primary outcomes. Researchers conducted a narrative synthesis and critical appraisal of the study to assess the strength of the evidence and limitations using the PICO technique.

RESULT

PMS Mechanisms and Key Symptoms

Premenstrual syndrome (PMS) can be characterized by the presence of physical and emotional symptoms that often appear during the luteal phase of the menstrual cycle, significantly affecting a woman's quality of life. Symptoms vary and include mood swings, anxiety, irritability, chest pain, fatigue, bloating, sleep disturbances, nausea, and flatulence.⁴ The pathogenesis of PMS involves complex psycho-neuro-endocrine mechanisms influenced by the cyclical function of the hypothalamic-pituitary-ovarian axis, which alters the function of neurotransmitters such as the serotonergic system.⁵ Fluctuations in gonadal hormone levels, such as estrogen and progesterone, contribute significantly to the development of PMS symptoms. Treatments targeting the hypothalamic-pituitary-ovarian axis or serotonergic synapses in the brain have demonstrated efficacy in symptom management, indicating the involvement of endocrine and neurotransmitter systems in the pathogenesis of PMS.⁶

Apart from hormonal factors, the presence of other physiological factors, such as genetic background, metabolic processes, and psychological stressors, also influences the severity and presentation of PMS symptoms.⁷ Research shows that women with a family history of PMS tend to experience more severe symptoms, indicating a strong genetic component in their predisposition to PMS. Certain genetic polymorphisms that affect neurotransmitter pathways and hormone metabolism have also been associated with susceptibility to PMS.⁸

Metabolic processes in the body, including insulin sensitivity and lipid metabolism, also play an important role in the

manifestation of PMS symptoms. Women with insulin resistance or impaired lipid metabolism often report more severe PMS symptoms, suggesting that regulation of energy and fat metabolism may influence the balance of hormones and neurotransmitters involved in PMS. For example, high insulin levels can affect the production and metabolism of estrogen and progesterone, worsening PMS symptoms.⁹

Psychological stressors, such as daily stress levels, social support, and other mental health conditions, can worsen or relieve PMS symptoms. Chronic stress and anxiety disorders often correlate with increased intensity of PMS symptoms, given the importance of environmental factors in modulating physiological responses to the menstrual cycle.¹⁰

The Role of Nutrition in PMS

Nutrition plays an important role in alleviating premenstrual syndrome (PMS) symptoms, with various studies showing that diet and intake of certain micronutrients can influence the severity and frequency of PMS symptoms.¹¹ A high intake of vitamins and minerals such as calcium, magnesium, and vitamin D has been shown to help reduce PMS symptoms.¹² One study found that ensuring women with PMS consumed at least 1000 mg of calcium daily for two months led to significant improvements in PMS symptoms.^{12,13} Other minerals, such as magnesium, are also involved in many biochemical reactions in the body; consuming them has been shown to be effective in reducing pain and feelings of bloating. Magnesium supplementation can help relax muscles, prevent cramps, and reduce fatigue and emotional symptoms such as irritability.¹⁴ Vitamin B6, which plays a role in neurotransmitter synthesis, has been shown to reduce the symptoms of depression or fatigue associated with PMS.¹⁵ Vitamin D has also shown potential benefits for alleviating PMS symptoms, particularly through its role in regulating the immune system and reducing inflammation. Thus, insufficient vitamin D intake is also associated with an increased risk of mood disorders, including PMS.¹⁶

DISCUSS

Dietary interventions that effectively alleviate premenstrual syndrome (PMS) symptoms often involve changing the diet to include specific nutrients that have shown therapeutic benefits.¹⁷ Adopting a diet high in fiber and low in sugar has also been very beneficial for women with PMS. Fiber from fruits, vegetables, whole grains, and nuts helps regulate estrogen levels by increasing its excretion through the intestines.^{17,18} This process can reduce complaints such as abdominal bloating and pain that often occur during the luteal phase of the menstrual cycle. Research shows that a high-fiber diet, such as the Mediterranean diet, can lower circulating free estrogen levels, reducing the risk of PMS symptoms caused by hormonal imbalances.¹⁸ Additionally, a diet low in sugar and refined carbohydrates helps avoid blood sugar fluctuations that can worsen symptoms such as fatigue, mood swings, and emotional instability. Excessive consumption of sugar and refined carbohydrates can cause a rapid spike in insulin levels, followed by a sharp drop, which can negatively affect energy and mood.¹⁸

Additionally, a diet low in sugar and refined carbohydrates helps avoid blood sugar fluctuations that can worsen symptoms such as fatigue, mood swings, and emotional instability. Excessive consumption of sugar and refined carbohydrates can cause a rapid spike in insulin levels,

followed by a sharp drop, which can negatively affect energy and mood.^{18,19}

In addition to fiber and sugar control, omega-3 fatty acid intake also plays an important role in managing PMS symptoms. Omega-3s, abundant in fatty fish like salmon, sardines, and mackerel, have been linked to reducing inflammation and pain, common symptoms experienced during PMS (20). These fatty acids work by inhibiting the production of inflammatory prostaglandins, chemicals in the body that contribute to pain and inflammation. Another study showed that women who took omega-3 supplements or had high intakes through diet experienced significant reductions in pain intensity and PMS-related emotional symptoms such as depression and anxiety.^{20,21,22}

The main findings of this literature review indicate that nutrition and diet play a significant role in alleviating the symptoms of premenstrual syndrome (PMS). These studies show that high intakes of calcium, magnesium, vitamin D, and vitamin B6 can help reduce various physical and psychological complaints during the luteal phase of the menstrual cycle. On the other hand, regulating eating patterns and the type of diet also play a close role in managing PMS symptoms. Overall, evidence suggests that nutritional interventions that include calcium, magnesium, vitamin D, vitamin B6, fiber, and omega-3s can be an effective strategy for helping relieve PMS symptoms.^{12,14,15,16,21}

CONCLUSION

From this narrative review, it can be concluded that nutrition and diet play an important role in alleviating the symptoms of premenstrual syndrome (PMS). High intakes of calcium, magnesium, vitamin D, and vitamin B6 have consistently been proven to reduce various physical and psychological complaints experienced by women during the luteal phase of the menstrual cycle. Additionally, a diet high in fiber, low in sugar, and rich in omega-3 fatty acids from fatty fish has shown significant benefits in managing PMS symptoms such as bloating, mood swings, fatigue, and pain.

Limitations of the current study

Existing studies have several limitations to note, including that, although useful, many use observational designs that cannot establish cause-and-effect relationships. This research means that although there is a correlation between the intake of certain nutrients and a reduction in PMS symptoms, it is cannot be confirmed that those nutrients directly cause an improvement in symptoms; variations in study methodology, such as differences in sample size, study duration, and symptom measurement methods, make it difficult to directly compare results and draw definitive conclusions; and the last is most studies rely on self-reports from participants, which can be prone to bias and inaccuracy.

Additionally, there are limitations to the generalizability of this review.

Many studies are conducted on specific populations, such as women in developed countries, who may have different diets and access to nutrition compared to women in developing countries. This research limits the ability to apply these findings universally. To overcome these limitations, further studies with more rigorous designs, such as randomized clinical trials, are needed to confirm these preliminary findings. Research also needs to include more diverse populations to increase the generalizability of the results. With a more comprehensive research approach, it is hoped that the research can better understand nutrition's role in managing PMS and develop more effective intervention strategies.

REFERENCES

1. Antini A, Trisnawati I. Pengaruh Pemberian Puding Daun Kelor Dan Jagung Manis Terhadap Premenstrual Syndrome Pada Remaja Putri. *Jurnal Riset Kesehatan Poltekkes Depkes Bandung*. 16(1):212–21.
2. Suardi D. Hubungan Aktivitas Fisik Dan Stress Dengan Kejadian Tipe Premenstrual Syndrome (Pms) Pada Remaja Putri Di Smp Tonjong Tahun 2021. *Jurnal Kebidanan*. 11(2):145–54.
3. Resmaniasih K. Pengaruh Konsumsi Puding Bayam Merah Terhadap Keluhan Dismenore Dan Gejala Sindrom Premenstrual Pada Remaja Putri. *Jurnal Surya Medika*. 8(1):180–3.
4. Effect Of Vitamin D Supplementation On Symptoms Severity In Vitamin D Insufficient Women With Premenstrual Syndrome: A Randomized Controlled Trial. *Clinical Nutrition Espen*. 59:241–8.
5. Gudipally Pr, Sharma Gk. Premenstrual Syndrome. *Statpearls*.
6. Siminiuc R, Turcanu D. Impact Of Nutritional Diet Therapy On Premenstrual Syndrome. *Frontiers In Nutrition*. 10.
7. Świątek G, Środoń M, Sosnowska W, Tkaczyk R, Taracha K, Tomczyk J, Et Al. Premenstrual Syndrome - Theories And Facts - Something Everyone Should Know. *Journal Of Education, Health And Sport*. 39(1):38–54.
8. Ngo Vdt, Bui Lp, Hoang Lb, Tran Mtt, Nguyen Hvq, Tran Lm, Et Al. Associated Factors With Premenstrual Syndrome And Premenstrual Dysphoric Disorder Among Female Medical Students: A Cross-Sectional Study. *Plos One*. 18(1):E0278702.

9. Jaholkowski P, Shadrin Aa, Jangmo A, Frei E, Tesfaye M, Hindley Gfl, Et Al. Associations Between Symptoms Of Premenstrual Disorders And Polygenic Liability For Major Psychiatric Disorders. *Jama Psychiatry*. 80(7):738.
10. Gallon Cw, Ferreira Cf, Henz A, Oderich Cl, Conzatti M, De Castro Jrs, Et Al. Leptin, Ghrelin, & Insulin Levels And Food Intake In Premenstrual Syndrome: A Case-Control Study. *Appetite*. 168:105750.
11. Huwaida Dz, Dewi Ylr, Kusnandar K. Unhealthy Diet And Stress Are Correlated With Premenstrual Syndrome In Adolescent Girls In Tangerang. *Media Gizi Indonesia*. 17(2):168–73.
12. Yurt M, Mercanligil Sm, Kabaran S. Effect Of Dairy Products Intake In Women With Premenstrual Syndrome: A Randomized Controlled Trial. *Progress In Nutrition*. Vol. 22.
13. Moradifili B, Ghiasvand R, Pourmasoumi M, Feizi A, Shahdadian F, Shahshahan Z. Dietary Patterns Are Associated With Premenstrual Syndrome: Evidence From A Case-Control Study. *Public Health Nutrition*. 23(5):833–42.
14. Chandna A, J Sb, Lalwani R. Assessment Of Serum Calcium And Magnesium Levels In Subjects With Pre-Menstrual Syndrome. *International Journal Of Clinical Biochemistry And Research*. 9(1):67–70.
15. Retallick-Brown H, Blampied N, Rucklidge Jj. A Pilot Randomized Treatment-Controlled Trial Comparing Vitamin B6 With Broad-Spectrum Micronutrients For Premenstrual Syndrome. *The Journal Of Alternative And Complementary Medicine*. 26(2):88–97.
16. Heidari H, Amani R, Feizi A, Askari G, Kohan S, Tavasoli P. Vitamin D Supplementation For Premenstrual Syndrome-Related Inflammation And Antioxidant Markers In Students With Vitamin D Deficient: A Randomized Clinical Trial. *Scientific Reports*. 2019 Oct 17;9(1):14939.
17. Helmy Na, Kamel Dm, Gabr Aa, Shehata Mma. Do Dietary Habits Affect The Premenstrual Syndrome Severity Among A Cohort Of Egyptian Females? A Cross-Sectional Study. *Bulletin Of Faculty Of Physical Therapy*. 28(1).
18. Kelvin I, Rivami Ds. The Relationship Between High Fiber Diet And Severity Of Premenstrual Syndrome Symptoms In Medical Students Of Pelita Harapan University. *Medicinus*. 9(3):91.
19. Kwon Yj, Sung Di, Lee Jw. Association Among Premenstrual Syndrome, Dietary Patterns, And Adherence To Mediterranean Diet. *Nutrients*. 14(12):2460.
20. Thakur H, Pareek P, Sayyad Mg, Otiv S. Association Of Premenstrual Syndrome With Adiposity And Nutrient Intake Among Young Indian Women. *International Journal Of Women's Health*. Volume 14:665–75.
21. Farpour S, Soleimani D, Moradinazar M, Samadi M. The Relationship Of Dietary Inflammatory Index And Dietary Patterns With Premenstrual Syndrome Among Women In Kermanshah: An Analytical Cross-Sectional Study. *Food Science & Nutrition*. 11(7):4146–54.
22. Aditya Sa. Hubungan Asam Lemak Omega 3, Imt/U Dan Tingkat Stres Dengan Tingkat Premenstrual Syndrome (Pms) Pada Remaja Putri Tunagrahita Di Kecamatan Margaasih. *Indonesian Journal Of Health Development*. 4(2):60–8.