REVIEW ARTICLE

Etiology Symptomatology and Management Strategies for Premenstrual Syndrome and Premenstrual Dysphoric Disorder

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Abstract

Physical and emotional symptoms that start a week or two before your menstruation are referred to as premenstrual syndrome (PMS). The severe form of PMS is also called premenstrual dysphoric disorder. Hormonal shifts happening during the early luteal phase are the major reason for it. The symptoms begin after the ovulation and intensify during the time of menstruation. The hormonal shifts occurring during the luteal phase before menstruation lead to PMS. There are two types of symptoms, namely, physical and emotional/behavioral symptoms. Anxiety, depression, bloating, and breast tenderness are some of the symptoms occurring in the late luteal phase of menstruation. The severity of PMS symptoms may vary among individuals based on their BMI, habits such as caffeine intake, smoking, and alcohol consumption. PMS can be treated using pharmacological and non-pharmacological treatments. Non-pharmacological methods are the best way as they lessen the side effects caused due to medication. Lifestyle modifications play an important role in treating the PMS symptoms. Regular exercise, a change in sleep pattern, and avoiding tobacco are some of the lifestyle changes that can reduce the pain and severity caused by PMS. Early diagnosis also helps in reducing the symptoms. The severe PMS symptoms result in the diminishing work productivity and relationship problems.

Key words: Depression, hormonal shift, lifestyle change, luteal phase, premenstrual dysphoric disorder

INTRODUCTION

Physical and emotional symptoms that start a week or two before your menstruation are referred to as premenstrual syndrome (PMS).[1,2] PMS was formerly called "premenstrual tension".[3] The majority of menstruating women experience at least one PMS symptom.[4] Usually, these signs indicate that your menstruation is about to arrive.[5] PMS symptoms normally disappear after menstruation. It is common for these symptoms to resurface around the same time every menstrual cycle.[6] One severe and potentially incapacitating form of PMS is called premenstrual dysphoric disorder (PMDD).[7] It affects roughly 3% of menstruating women, making it far less common than PMS. PMDD symptoms are similar to those of PMS, but they are significantly more severe, particularly in terms of mood and emotional reactions.[8] Anger, severe depression, and anxiety

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are prevalent in people with PMDD than in those with PMS. Although there is a lengthy list of possible PMS signs, most women only encounter a handful of them.[9] The signs of PMS typically appear 1–2 weeks before the onset of menstruation. However, the time is not always precise. Two weeks or 2 days before your period, you may have PMS.[10]

Because PMS is so prevalent, many individuals consider it a nuisance during that time of the month.[11] An individual cannot let PMS ruin their life just because it's common. Often, medication and lifestyle modifications can help to manage PMS symptoms.[12] Consulting a provider for helpful therapies if nothing shows a significant enough impact. Before finding a treatment that helps them with their symptoms, some people might need to try a few different ones. Management of PMDD and PMS comprises both non-medical and medical interventions.[13] Traumatic events, early physical and emotional abuse, and post-traumatic stress disorder are associated with PMS/PMDD.[14] Non-medical therapies present an effective alternative or supplement to medications, utilising proven strategies to enhance mental well-being and overall life quality.[13] Individual techniques and treatment strategies should be used to reduce the symptoms of PMS and increase quality of life. Women should monitor their symptoms, choose the best treatment options, and seek professional assistance. Improving awareness and appropriate handling of PMS is an important step for supporting women's health.[15]

In this article, we review the non-pharmacological techniques used in curing the PMS, which happens as a part of every woman's life. Here, the symptoms faced have been discussed and the hormones responsible for this are also been noticed. The causes of PMS in women are various reasons that affect their work productivity and relationships. The non-pharmacological method used has been discussed. This review attempts to show that the PMS can be cured or treated with any medications. Avoiding medications and adapting these techniques reduces the side effects caused by the medicine.[16]

EMOTIONAL, BEHAVIORAL, AND PHYSICAL SYMPTOMS DURING PMS

PMS could be linked to over 150 distinct behavioral, emotional, and physical problems.[17] Headaches, breast discomfort, irritability, and mood changes are typical signs of PMS.[18]

Complications include mood changes, breast tenderness, and headaches. Physical, emotional, or a combination of the two might be indicators of PMS.[6] In addition, they may be moderate, severe, or in between. Not everyone has PMS. PMS symptoms might alter for woman's life, regardless of what they do.[19] The PMS symptoms are related to the ovarian estrogen and progesterone levels reduction.[20] The symptoms of PMS have been classified in Table 1.

Table 1: Classification of PMS symptoms

Physical symptoms	Emotional and behavioral symptoms
Bloating or a gassy feeling	Irritability or lashing out toward others
Pelvic pain	Mood swings
Fatigue	Changes in sex drive
Acne flare-ups	Feeling anxious, sad, or having crying spells
Breast soreness	Brain fog or trouble concentrating
Headaches	Food cravings or altered appetite
Diarrhea or constipation	Trouble sleeping (insomnia)

PMS: Premenstrual syndrome

Physical symptoms

According to the National Institutes of Health (NIH), some women may get upper airway infections (similar to a cold) before their period, which go away once menstruation starts.[19] Skin issues, before menstruation, skin disorders such as erythematous and edematous skin plaques (red, swollen spots) may manifest. Enhanced breast sensitivity and tenderness are also one of the physical symptom.[6] As reported by Women's Health, this can be so bad that some women must wear a bra all the time. According to Medical News Today, retaining fluids and inflammation can cause temporary weight gain, swollen hands, feet, and ankles, as well as reduced production of urine.[21] Additional physical symptoms include clumsiness, changes in libido, and unusual sensitivity to light or sound.[22] The physical symptoms of PMS have been represented in Figure 1.

Physical indications and symptoms, joint or muscle discomfort, fatigue, headaches, and weight gain associated with retained fluids are some of the less typical PMS symptoms.[23,24] Bloating in the abdomen, tenderness of the breasts, flare-ups of acne, diarrhea or constipation, and alcohol intolerance are also symptoms involved.[25] Women with overweight and have high BMI are likely to experience more pain during PMS[26] and reduce menstrual regularity.[27] PMS might present with unusual symptoms such as ovulation symptoms, premenstrual upper respiratory infections, skin plaques, or even mental health problems such as psychosis or hypomania.[28] PMDD, which can have a major influence on day-to-day living, is another term for more severe PMS symptoms that some women may experience.[29]

Emotional and mental shifts

PMDD is the more extreme version of PMS that can cause extreme mood swings, melancholy, anxiety, impatience, and trouble focusing.[7] According to a NIH study, some women may go through manic or hypomanic states in the days leading up to their periods. Auditory hallucinations and misconceptions,

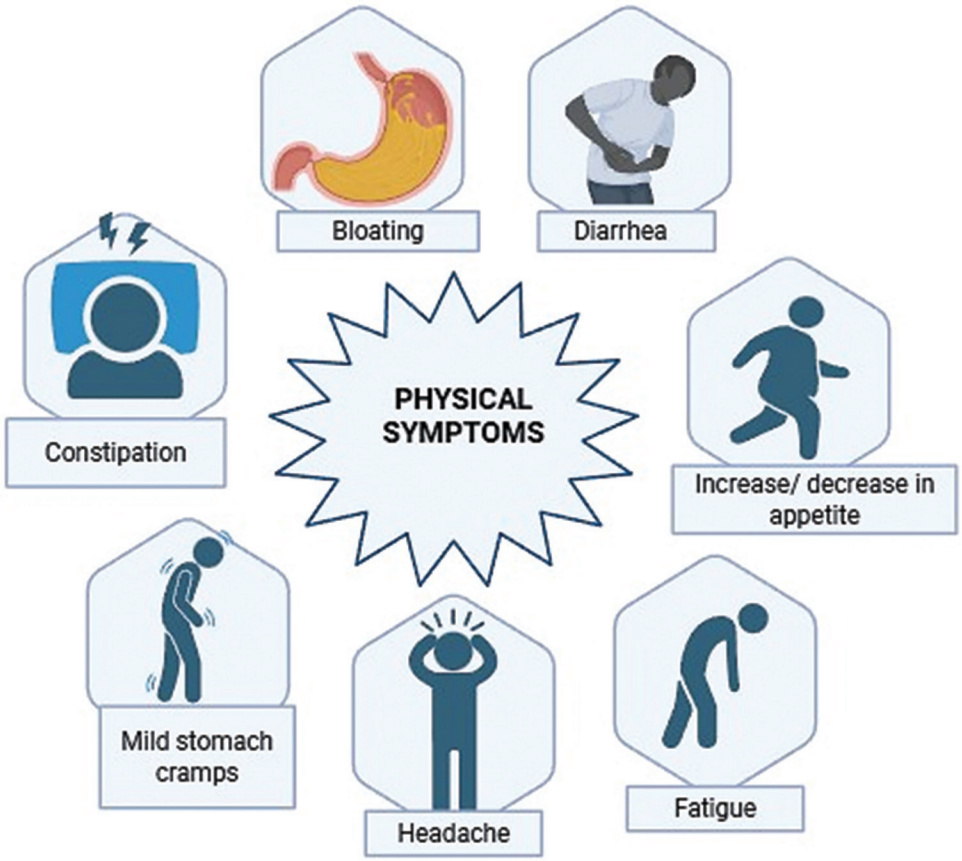

Figure 1: Physical symptoms of premenstrual syndrome

rarely premenstrual episodes of auditory hallucinations and delusions, especially those involving reference, may occur.

Exacerbation of pre-existing mental health issues, PMS may make the signs of sadness, anxiety, or other mental illnesses severe.[29] Mental and emotional indicators are anxiety or tension, a depressed state of mind, bouts of tears, fluctuations in state of mind, impatience, or anger, Changes in appetite and food desires, difficulty sleeping (insomnia), social disengagement, Insufficient focus, and Libido shift. Anger and sadness are the most common emotional symptoms experienced by women in PMS.[30] Ghrelin is also referred to as the "hunger hormone". It is one of the hormones that significantly influence appetite regulation. Blood levels of ghrelin tend to rise when the body is hungry, rise a little before meals, and fall sharply after meals. This trend implies that ghrelin stimulates appetite and hunger in healthy people.

Multiple investigations have also demonstrated that hormonal variations, including those that occur during the premenstrual period, can impact ghrelin levels. This might assist in clarifying women who perceive a boost in appetite during PMS.[31] A medical professional makes a diagnosis of PMS based on your symptoms. They will inquire about the signs and symptoms, how frequently they occur, and how they affect women life. To be diagnosed with PMS, the symptoms need to be addressed in detail by a medical professional. For PMS, there are numerous alternatives for management and treatment.[32] Some of the emotional symptoms have been represented in Figure 2.

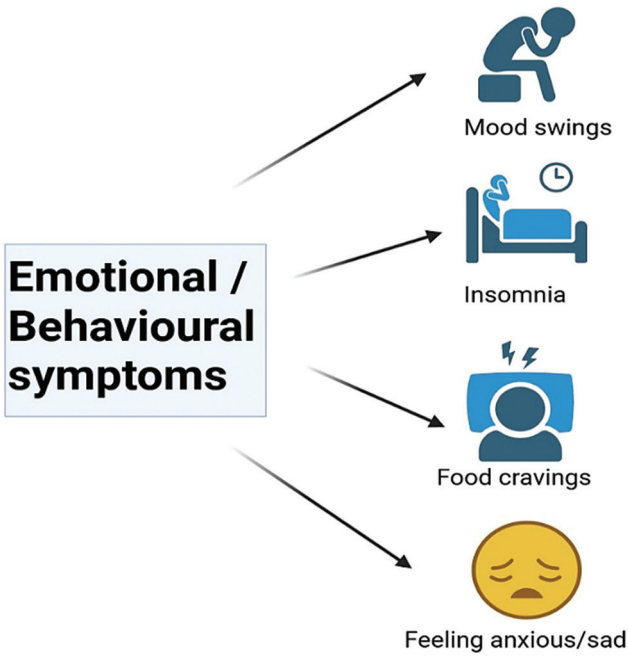

Figure 2: Pictorial representation of premenstrual syndrome emotional/behavioral symptoms

FACTORS INFLUENCING PMS IN YOUNG ADULTS

The precise cause of PMS is unknown. However, the majority of medical professionals think that hormonal changes associated with your menstrual cycle are the cause of PMS.[33]

Near ovulation, when estrogen and progesterone levels rise, symptoms typically appear. These hormone levels fall for a few days after the onset of menstruation, and then they begin to climb once more. These hormonal shifts may cause PMS. The fact that PMS affects people differently may be because certain individuals are more vulnerable to hormonal changes.[15] The rise in the hormones has been picturized in Figure 3.

Anxiety, depression, perimenopause, chronic fatigue syndrome, thyroid issues, and irritable bowel syndrome are among the factors that your doctor will rule out.[34] Hormonal changes in women during pregnancy and postpartum depression lead to an increase the menstrual syndrome.[35] An individual may be at a higher risk of developing PMS if they have had postpartum depression in the past, anxiety, or depression in their familial or personal life, elevated levels of stress women in their late 20s and early 30s are typically diagnosed with PMS by medical professionals. Traumatic events, early physical and emotional abuse, and post-traumatic stress disorder are associated with PMS/PMDD.[36]

PMS and PMDD

A severe form of PMS, also known as PMDD is typified by extreme physical and emotional symptoms that can seriously interfere with day-to-day functioning.[37,38] PMDD, previously called late luteal phase dysphoric disorder.[39] The menstrual cycle has three stages proliferative phase, ovulation, and the luteal phase. All the symptoms of PMS become intense and extreme during the luteal phase of menstruation or the time before menstruation.[40] Extreme mood swings, such as severe irritation, anxiety, or depression, can impact relationships, employment, and general well-being, whereas PMS results in fewer physical and emotional changes.[41] The Key Differences have been addressed. Severity, with more acute and disruptive symptoms, PMDD is a more severe type of PMS.[42] Emotional Impact is extreme mood swings, such as extreme irritation, rage, and depression, which are hallmarks of PMDD and can have a significant impact on relationships and day-to-day functioning.[43] These symptoms show low work productivity, problems in marital problems, and increased sick days.[44] The key difference between PMD and PMDD has been tabulated in Table 2.

Bloating, breast soreness, and exhaustion are examples of physical symptoms that can be caused by either PMS or PMDD.[37] Therapy to control the intensity of signs, PMDD may need more extensive treatment, such as hormone therapy, antidepressants, or other therapies.[42] PMS typical symptoms include mood swings like irritation and melancholy, as well as physical symptoms like bloating, breast tenderness, headaches, and exhaustion.[45] PMDD, in addition to physical symptoms resembling those of PMS, PMDD symptoms might include severe irritability, anxiety, or depression.[42]

Essentially, PMS is a more prevalent and milder version of premenstrual symptoms, whereas PMDD is a more severe and occasionally incapacitating variant of PMS that necessitates more extensive medical care.[37] There is no conclusive proof that PMS gets worse at a specific age. Researchers think that all age groups experience PMS symptoms at comparable rates.[15] Some people think that when they get into their 40s, their PMS symptoms get worse. However, this is typically brought on by perimenopausal symptoms (such as vaginal dryness or hot flashes).[37]

NON-PHARMACOLOGICAL THERAPY

Non-pharmacological therapy involves non-medication therapy for curing or dealing with the PMS. One of the

Table 2: Key differences between PMS and PMDD

PMS	PMDD
Acute and disruptive symptoms	Severe type of PMS
Physical and behavioral symptoms	Extreme PMS symptoms that impact relationships
Bloating, breast tenderness, headaches	Severe irritability, anxiety, or depression

PMS: Premenstrual syndrome, PMDD: Premenstrual dysphoric disorder

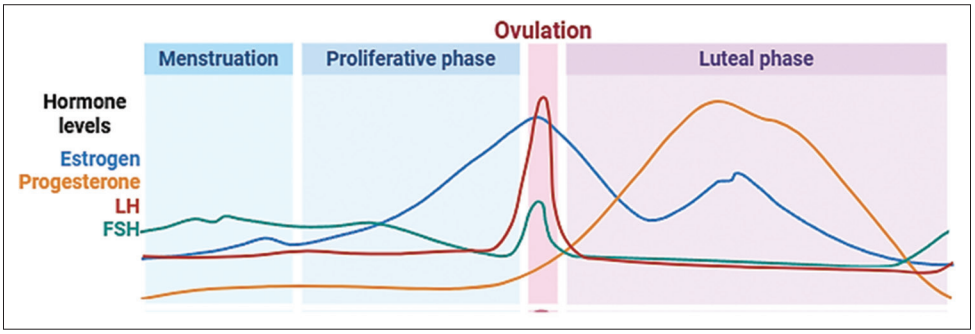

Figure 3: The fluctuation of hormones during the different phases of the menstrual cycle

non-pharmacological therapies is lifestyle change. This dietary change or lifestyle change aids in pain relief and fights against PMS's mood-related symptoms.[46,47] Some of the examples are exercising regularly. 30 min a day of moderate activity (walking, swimming) can improve your mental state and reduce stress. Exercise is also beneficial to your general health.[41] Providing a nutritious diet is also important. PMS symptoms and food intake are closely related to each other and influence each other.[48] Fast food consumption increases the severity of symptoms and is related to psychological symptoms.[49] Dietary practices also include a low intake of salt and sugar.[50] The effects of PMS might be lessened by eating fewer items and more of others.[6] To help prevent signs of PMS, cut back on foods high in fat, sugar, and salt, and limit your intake of caffeinated and alcoholic beverages for 2 weeks before the menstrual period.[32]

A wide range of data linking caffeine consumption to PMS symptoms has been found in the literature. Numerous studies have verified that women with PMS symptoms typically drink more coffee than women without the condition. Caffeine should be avoided by women who suffer from PMS symptoms, according to the ACOG.[51] Women who suffer from weariness, however, might attempt to alleviate this problem by consuming more caffeine. In intellectual (psychomotor) tests, women may respond more slowly in the luteal phase than in the follicular phase.[52] Increased progesterone levels and decreased luteal phase estradiol levels have been linked to higher caffeine consumption. Caffeine may have an impact on PMS symptoms through the depressing effect of adenosine on central neurons.[4] Choose whole grains, fruits, and veggies instead.[32] Women with the intake of high carbohydrate and low protein during the late luteal phase experience PMS symptoms.[24,25] Intake of low nutrients also causes primary dysmenorrhea.[53]

Sleep disturbance is caused due to melatonin production.[54] Obtaining a lot of rest also helps in PMS. Sleeping for at least 8 h a night can help feel less irritable.[55] The added benefit of waking up and going to bed at the same time every day is that it synchronizes the internal clock, which reduces the likelihood of mood swings during the day.[29] Engaging in relaxing techniques such as breathing techniques, yoga, and meditation can all help reduce stress and fight off the anger and depression that frequently accompany PMS. Avoiding tobacco use plays an important role in reducing PMS symptoms, which may intensify with tobacco consumption.[47]

Until menopause occurs and periods stop, PMS won't completely go. There are many things one can do in the interim to assist in controlling the signs and keep them from interfering with daily life.[40] The prevention of PMS has seemed impossible, but its signs can be controlled or managed with changes in lifestyle, medication, or a combination of both.[56] Sharing symptoms, such as their severity and timing, including when the last two periods began and ended, is also considered important. Women can keep track of this information using pen and paper, a calendar, or a phone app.[33] This assists woman and her provider in determining the best course of action. Some people experience mental and physical pain that interferes with their daily functioning. For most women, the signs and symptoms resolve 4 days after the menstrual period begins, regardless of their severity. However, a small percentage of PMS sufferers experience incapacitating symptoms each month.[38]

Manifestation of PMS

The manifestations of PMS and PMDD include mood swings, melancholy, anxiety, rage, and feelings of overload, as well as difficulties focusing, impatience, and tension.[57] Mood swing was noted as an illness that overlapped with behavioral, somatic, and psycho-emotional symptom. When accompanied with excruciating discomfort, PMDD can cause mood swings and negatively impact job and academic activities.[58] Although the precise cause of PMS is uncertain, several other factors could be involved. Fluctuations in hormone levels, PMS symptoms, and indicators alter with changes in hormone levels and go away throughout pregnancy and menopause.[6] Alterations in brain chemistry, PMS symptoms may be brought on by changes in a neurotransmitter that is believed to be a key player in mood states.[59] Fatigue, food cravings, sleep issues, and premenstrual depression can all be caused by low serotonin levels.

Depression

Undiagnosed depression is present in some women with severe PMS, while not all of the symptoms are caused by depression alone.[19] Women who have PMDD or are neurobiologically sensitive to hormone fluctuations may be more likely to experience suicide thoughts and actions. The current findings further highlight the need for better and uniform screening for suicide ideation in women with PMDD, as well as for greater awareness among medical professionals.[41,60]

POTENTIAL BENEFITS SUGGESTED

The frequency of using pain killers has been increased, so adaption of non-pharmacological method benefits increase.[49] A variety of Under certain circumstances, such as chronic pain, anxiety, and depression, individuals can benefit from non-pharmacological therapies, which are often less costly and have fewer adverse reactions than pharmaceutical treatments. These therapies also offer many advantages, such as decreased pain, enhanced quality of life, increased patient autonomy, and decreased dependence on medication. The non-pharmacological methods show a particular advantage over PMS. Even in chronic pain conditions, non-pharmacological therapies can considerably lessen the severity of pain.[61] Better Quality of Life: These treatments can improve general quality of life by treating pain, anxiety, and other symptoms. Early detection of the symptoms and timely advise by the medical

professional is needed.[62] Enhanced Patient Autonomy, Non-pharmacological methods enable patients to actively participate in their health management, which may result in higher levels of self-efficacy.[7] Decreased Medication Use, by reducing the need for painkillers, these therapies can help minimize drug dependency and its possible negative effects. Decreased Anxiety and Depression, Cognitive treatments and mind-body exercises are two strategies that can help manage anxiety and depression.[63] Exercise regimens and physical treatment can enhance mobility and physical function.[32] By enhancing patient health and lowering the need for drug management, non-pharmacological therapies can lessen caregiver burden. Non-pharmacological therapy examples include physical therapy, which strengthens, reduces pain, and increases mobility with exercises, massage, and other physical therapies. Mind-body practices methods help people relax and reduce stress. This includes activities such as yoga, qigong, and meditation.

Benefits of non-pharmacological techniques

Cognitive behavioral therapy (CBT) is a method to assist patients in controlling their thoughts, emotions, and actions concerning pain and other ailments.[35] Managing emotions and pain via the use of music, art, and other creative expressions is known as creative arts therapy. Using laser light to promote healing and lessen discomfort is known as laser therapy. Supplementation reduces the symptoms and side effects caused due to medications. Non-pharmacological techniques involved in stress relief provide patients their self-control. Acupuncture is one of the treatments that help in the reduction of PMS symptoms. It helps in reducing pain caused in the luteal phase of menstruation. Transcutaneous electrical nerve stimulation is a technique that blocks pain impulses by applying electrical stimulation. Giving patients the knowledge and resources they need to manage their ailments is known as therapeutic education.[64] Figure 4 represents the non-pharmacological methods for treating depression.

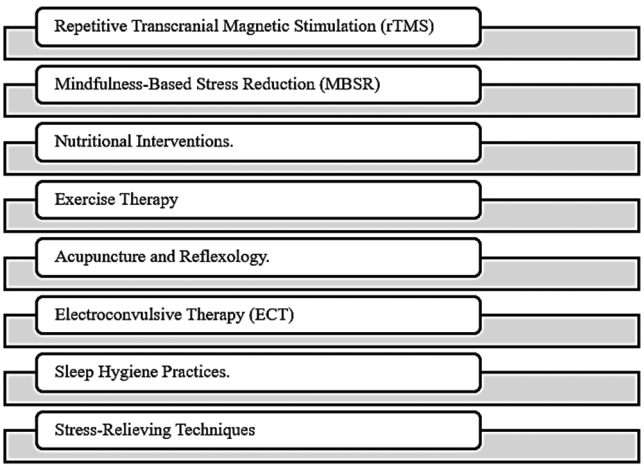

Figure 4: Non-pharmacological treatments for depression

IMPORTANT CONSIDERATIONS REVOLVING

Non-pharmacological treatment comprises activities such as aerobic workouts, eating complex carbohydrates, having meals frequently, relaxation techniques, light therapy, sleep deprivation, and CBT. Make physical activity a part of your everyday routine. Aim for at least 30 min of brisk walking, cycling, swimming, or other aerobic exercises nearly every day of the week. Consistent daily exercise can enhance your overall well-being and reduce specific symptoms such as tiredness and low mood.[65]

Diagnosis and supplementation

Since there is no clear chemical biomarker of PMS, the diagnosis of PMS is based on symptoms and the link to the luteal phase.[66] For mild-to-moderate symptoms, it is advisable to begin with non-drug treatments. Physical activity is supported by some evidence as a way to alleviate premenstrual symptoms.[67] CBT shows the strongest evidence for addressing premenstrual symptoms. CBT improves the perimenstrual quality of young women while diminishing the intensity of their symptoms. It did not, however, significantly impact the later follicular quality of life.[68] Calcium supplementation of up to 1200 mg/day is well-supported. Other vitamins and herbal remedies have limited evidence. Manage stress levels, ensure adequate sleep, and engage in progressive muscle relaxation or deep-breathing exercises to help alleviate headaches, anxiety, or insomnia.[38] Consider practicing yoga or receiving a massage to help unwind and reduce stress. Keep a record of symptoms for a few months.[61] Maintain a log to determine what triggers the symptoms and when they occur. This will enable women to apply strategies that could potentially reduce them. Some of the Important Considerations are personalized strategy, lifestyle adjustments, consulting a healthcare professional, and logging the symptoms.[25] Personalized strategy is the most effective way to manage PMS symptoms differ from one individual to another. Making the changes to your lifestyle helps in evaluating how they affect your symptoms.[69] If symptoms are intense or disrupt your daily activities, seek medical advice from a healthcare professional to explore additional treatment possibilities, including medication options. Logging symptoms helps in maintaining a pinpoint trigger and the timing of symptoms, facilitating more precise interventions.[33]

Lifestyle modification

Some of the lifestyle modifications are cutting back on sodium and meals high in salt to help reduce bloating and fluid retention. Eat more often and in smaller amounts to reduce bloating and feelings of fullness. Pay attention to complex carbs such as whole grains, fruits, and vegetables to help lower cravings and offer long-lasting energy.

Incorporate foods high in calcium: If dietary intake is inadequate, calcium supplements may also be beneficial.[13] Recent evidence shows that Vitamin D is associated with the menstrual problems.[70]

The low level of Vitamin D and calcium elevate the pain. Avoid alcohol and caffeine as they can make some PMS symptoms worse. Frequent aerobic activity, trying to get in at least 30 min of walking, cycling, or swimming most days of the week.[71] The cause of PMS is unknown, but studies revealed that changing hormone levels, such as those of estrogen, progesterone, testosterone, prolactin, and serotonin synthesis in the brain, also appear to play a major role in PMS.[22] Stress reduction is also one of the ways to control the PMS symptoms. Sufficient sleep, aiming for 7-8 h per night is recommended. Relaxation methods, including progressive muscular relaxation, deep breathing exercises, yoga, and meditation, can all help lower stress and anxiety.[53] Take into account massage therapy, which can ease tension and relax muscles. CBT can lessen the burden of PMS on day-to-day living by identifying and managing its emotional and psychological components.[72] Making connections with people who are aware of PMS helps lessen feelings of loneliness and offers emotional support.[33] Some women may benefit from calcium, magnesium, and Vitamin B6 supplements. Herbal Remedies such as chaste berry (Vitex agnus-castus), which has been used traditionally for PMS, may be beneficial. One of the alternative methods is taking hot baths regularly may help ease tense muscles and pain.[73] In certain women with PMDD, a more severe form of PMS, bright light treatment has demonstrated some potential in lowering tension and despair.[36] Figure 5 represents some of the pain relief techniques in PMS.

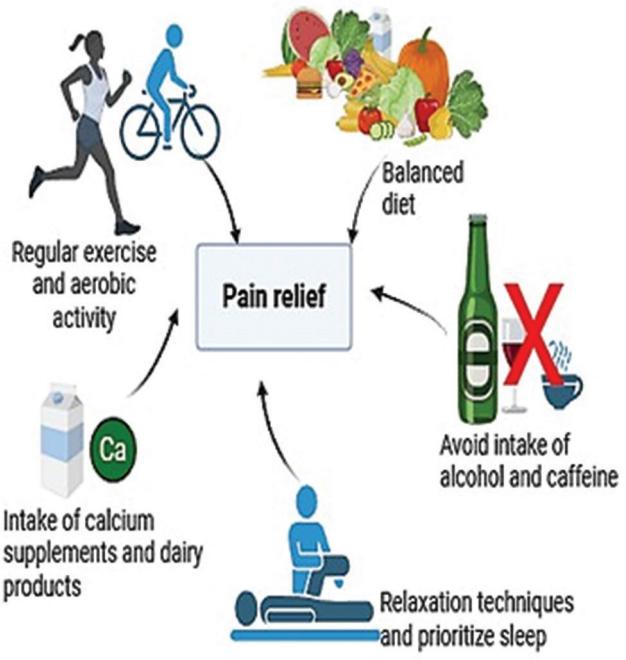

Figure 5: Pain relief techniques in premenstrual syndrome

INDIVIDUAL VARIABILITY AND INTENSITY OF STIMULATIONS

The phrase "individual variability and intensity of stimulation in premenstrual syndrome (PMS)" describes how various people react to and perceive PMS symptoms and causes. Individual differences in PMS are biological differences, that is, Genetics, age, and general health, all have an impact on how each person is affected by changes in hormones, particularly those of estrogen and progesterone. Psychological factors, the perception and intensity of PMS symptoms, can be changed by stress levels, coping strategies, and mental health issues like anxiety or depression. Lifestyle and surroundings, Social support, exercise, sleep patterns, and diet can all affect how PMS presents itself in various people.[74]

The body responses are affected by the changes occurring in the sexual hormones. PMS sufferers are particularly susceptible to changes in sex hormone levels throughout the menstrual cycle.[13] These changes are seen frequently in reproductive-aged women. The activation of sensory and motor nerves helps in the recovery process.[75] Individual variability and stimulation intensity describe a person sensitivity to changes in hormones or outside stimuli during premenstrual stage. For instance, some people might be more sensitive to stress, pain, or stimuli like light and noise.[64]

The pain threshold is seen more in premenstrual stage rather than the ovulation stage.[75] Literature implies that a balance between free radicals and antioxidants is crucial in supporting immune function and general health. Supplementing women with vitamins results in the reduction of the oxidative stress profile of women affected by PMS.[76] Because progesterone and estradiol have anti-inflammatory and anti-oxidant qualities, their decrease in the late luteal phase increases endometrial oxidative stress and the production of matrix metalloproteinases, cytokines, chemokines, and proinflammatory prostaglandins. Recent studies suggest a link between peripheral inflammation and PMS/PMDD; however, the findings remain disputed.[36] In certain people, changes in neurotransmitters (such as serotonin) can make them more irritable or emotionally reactive. Neurotransmitters or neuropeptides that function in the brain are impacted of hormonal changes.[64] For some people, external factors such as a heavy workload, interpersonal strife, or inadequate sleep can exacerbate PMS symptoms, but not for others.[6] According to studies, rather than having aberrant hormone levels, women with severe PMS or PMDD may have reduced sensitivity to normal hormonal fluctuations. The way that the brain changes its responsiveness to emotional or sensory stimuli during the menstrual cycle is a topic of increasing research. One of the non-pharmacological treatments for PMS is transcutaneous electrical acupoint stimulation, which involves activating specific acupoints using a mild electric current and has been shown to help relieve PMS associated pain.[77]

RECENT REPORTS AND FUTURE CONSIDERATIONS

Recently, it has been reported that there is a delay in the diagnosis. Women's caring experiences are very bad at this time. This results in negative outcomes such as stress.[78] Recent researchers often discuss the environmental factors, hormonal shifts, and genetic predispositions. Hormones such as estrogen and progesterone shift throughout the menstrual cycle. Estrogen modulates migraine vulnerability. Sensitivity to pain stimuli and changes in serotonin metabolism happen during the withdrawal of estrogen. Research has demonstrated that hormonal treatments that stabilize estrogen levels can lower the incidence of menstrual migraines and mood disorders associated with PMS, confirming the importance of this mechanism. Progesterone influences gamma-aminobutyric acid (GABAergic) neurotransmission, which plays a role in mood stabilisation and pain modulation. Sudden variations in its levels during the rise in progesterone in the menstrual cycle might result in stress sensitivity, irritability, and mood dysregulation.[79]

Several research studies have been conducted to understand the PMS and its symptoms. Yet, the identification and improvement of PMS migraine comorbidity should be managed. The recently discovered leads to overlooking the symptoms and ends up in mismanagement. More efficient, customized treatment plans may result from incorporating hormone monitoring and genetic screening into clinical practice. Rather than treating each condition separately, overlap can result in better treatment approaches that target every aspect of symptoms. To enhance patient treatment, future investigations should concentrate on the creation of uniform diagnostic guidelines, investigation of hormonal pathways, and use of tailored therapy. One of the researches has proved that young women with high physical activity show milder PMS symptoms.[80] Recent findings reveal that eating habits are more in women with psychological and physical PMS symptoms.[81] Because smoking increases sensitivity to surrounding stressors, nicotine's influence on the neurocircuitry may cause PMS symptoms or exacerbate affective symptoms in women who already have them. Nicotine increases the hypothalamic-pituitary-adrenal axis, which causes cortisol to be secreted in excess and changes the function of the related monoamine neurotransmitter system.

Chemokines, which have already been linked to chronic stress, food consumption, and generalized anxiety disorder, have also been the subject of recent studies. CCL2, CCL5, and CCL11were among the chemokines that predicted more severe PMS symptoms, suggesting a potential connection between brain function and the uterus through the brain-chemokine axis.[43] Peripheral levels of proinflammatory interleukins and tumor necrosis factor-alpha were found to be elevated in women with PMS.[82] One of the recent researches says that the PMS might have a relationship with blood group. The people with the A and B blood groups were found to have high PMS symptoms. Furthermore, the AB blood group person experiences fewer symptoms. This has to be confirmed by future studies.[83] Some studies also reveal that climate change anxiety is seen more in people with PMS. They are the most noticeable person in society.[84] The substances responsible for the major PMS symptoms have been tabulated in Table 3.

Table 3: The substances associated with the PMS symptom before menstruation

Biological mediators	Associated PMS symptoms	References
Progesterone	Stress sensitivity, irritability, and mood dysregulation	[27]
Estrogen	Behavioral change, migraine	[38]
Serotonin	Sleep disorder, fatigue, and food cravings	[10]
Chemokines	Food consumption, anxiety disorder, chronic stress	[36]

CONCLUSION

Menstrual symptoms hinder the academic and social quality of life for the majority of female students in the reproductive age range. The menstrual cycle is associated with physical and emotional symptoms. Melatonin produced during this phase causes the sleep disturbance. Inadequate sleep leads to stress. The hormonal shift between estrogen and progesterone during ovulation ends in behavioral change of a woman. Early prevention and management of PMS and PMDD can be achieved by seeking medical professionals at the early symptoms. Thus, PMS plays a major role during every month in a woman's life. The psychological and physical symptoms can be reduced by treating them with non-pharmacological treatments. Some of studies prove that the physical characteristics such as BMI, regular menstrual cycle, irregular menstrual cycle, and history of using tobacco or smoking are associated with the severity of symptoms. Omega-3-fatty acids help in the overweight women to control their symptoms. Change in lifestyle, relaxation techniques, eating nutritious food, and a good care can reduce the severity of PMS. More vitamins and nutrition are required in handling, which can be provided by proper diet. This method provides a painless solution. Sharing the thoughts and the symptoms with the medical professional also helps in providing accurate treatment. Severe PMS has a chance to change a healthy lifestyle to a diabetic lifestyle.

AUTHORS' CONTRIBUTIONS

DK: Writing – Original Draft, Conceptualization, Formal analysis. VVGRS: Writing – Original Draft, Conceptualization, Formal analysis. IR: Writing – Review and Editing, Visualization, and Validation. MKDJ: Visualization, Validation, Formal analysis, Supervision.

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