



Review Article

Effect of Mindfulness-Based Interventions on Premenstrual Symptoms among Adolescent Girls: Review

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Abstract

Adolescence is characterized by high stress reactivity and fluctuating hormones, often leading to severe premenstrual symptoms that affect quality of life. Non-pharmacological interventions, particularly MBIs, are sought to manage these symptoms. A systematic review following PRISMA guidelines, analyzing literature focused on mindfulness-based practices (e.g., meditation, MBSR-T, yoga) implemented as a primary intervention to improve emotional regulation and alleviate physical/behavioral PMS symptoms in adolescent girls. The literature indicates that MBIs effectively reduce PMS-related discomfort, anxiety, and depression. Specifically, mindfulness training helps reduce pain-related catastrophizing, emotional reactivity, and depressive rumination. Evidence shows that MBIs, such as school-delivered Cognitive Therapy, improve self-regulation of emotions and reduce stress, with impacts often sustained over time. MBIs are a promising non-pharmacological approach for adolescents, improving mental health and mitigating PMS severity by reducing stress and improving emotional regulation.

Keywords: Mindfulness-Based Interventions (MBIs); Mindfulness-Based Stress Reduction (MBSR); Premenstrual Syndrome (PMS); Menstrual Stress; Adolescent Girls; Stress Management

INTRODUCTION

Among the various health problems, menstrual problems are essential to the health of adolescent girls. Premenstrual manifestations significantly impact the quality of life among young women, increase medical services use, and lessen work-related productivity.

Mindfulness-Based Interventions (MBIs), such as Mindfulness-Based Stress Reduction (MBSR) and Cognitive Therapy (MBCT), effectively reduce premenstrual symptoms (PMS) and associated emotional distress in adolescent girls. These interventions mitigate physical pain, anxiety, and depression by promoting emotional regulation and reducing stress reactivity, offering a valuable non-pharmacological, evidence-based approach to managing menstrual health. MBSR programs significantly lower overall PMS severity, including specific symptoms like pain and mood volatility.

MBCT and mindfulness-based psychological interventions have been shown to maintain reduced symptom levels, such

as lower anxiety and depression, for at least one month post-intervention. Mindfulness training helps individuals manage premenstrual dysphoric disorder (PMDD) and PMS by decreasing blood pressure and helping individuals view fluctuating emotional states as transient, rather than as reality. MBIs are well-received and beneficial for adolescents, providing skills to manage pain and improve quality of life. Studies show that integrating mindfulness with cognitive-behavioral theory (CBT) and self-regulation models provides a robust framework for reducing menstrual distress.

Background

Premenstrual syndrome (PMS) is one of the most common psychosomatic disorders characterized by manifestation of

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physical and psychological symptoms, which occur during the luteal phase of the menstrual cycle and resolve by the end of menstruation.

Anxiety, depression, fatigue, nervousness, irritability, confusion, and mood swings are the most common psychological symptoms of PMS, while breast tenderness, bloating, swelling, acne, increased appetite, headache, backache, and sleep disturbances are some of its physical symptoms. The premenstrual symptoms affect the quality of life and cause impairment in many aspects of the females' lives. Factors such as school dropout, increased rate of commitment to suicide, increased occupational complications, absence from the workplace, and increased demand for divorce from females during premenstrual period cause serious disturbances and inconveniences in females' lives. Such problems are due to the effect of PMS on the quality of life.

The etiology of PMS is not well understood, but the interaction between biological, psychological, environmental, and nutritional factors, ovarian hormones, as well as micronutrients deficiency may play a role in its etiology. An epidemiological study estimated that about 90% of females experience at least 1 symptom of PMS during their reproductive age. Also, the severe form of PMS or premenstrual dysphoric disorder (PMDD) occurs in 2.5% - 3% of females.

The treatment of PMS ranges from nonpharmacological management of psychotropic medications to hormones and contraceptive therapy. To treat PMS, a comprehensive program including training, counseling and psychological support, exercise, nutritional assessment, and in some cases if needed, medicine interventions should be administered. The multiple therapies are extensively available due to the multifactorial nature of the PMS syndrome including biological, psychological, and social factors that manifest on the onset of the syndrome. In several studies, psychological interventions were introduced to control the psychological and partly physical symptoms of the syndrome.

According to the American college of obstetricians and gynecologists (ACOG), the first-line treatment for premenstrual dysphoric disorder is pharmacotherapy; however, in the treatment of premenstrual symptoms, nonpharmacological approaches should first be administered for the cases with low-degree symptoms. Several psychological programs were used in the treatment of PMS so far, and some of them were reported effective. Blake *et al.*, evaluated the effect of cognitive behavioral therapy as a psychological treatment for females with PMS and almost complete remission of psychological and somatic symptoms was reported. In another study, a correlation between mindfulness-based intervention and PMS symptoms was also shown. Mindfulness is defined as a bringing one's nonjudgmental attention to thoughts, emotions, body sensations, and the interactions. This skill is considered as the main core in mindfulness-based cognitive therapy (MBCT). MBCT as an evidence-based psychological group

program helps people to manage and reduce their stresses and depressive symptoms. The mindfulness skill is trained through discussion sessions, cognitive behavioral exercises, and meditation.

Adolescence

Adolescence is defined as the period of life beginning with the appearance of secondary sex characteristics and ending with cessation of growth and emotional maturity. The term comes from Latin word adolescence, meaning to grow up". Adolescence is often divided into early, middle and late period.

Adolescents are more prone to premenstrual syndrome.

Premenstrual syndrome

Premenstrual Syndrome is defined as regular premenstrual physical or emotional symptoms that interfere with daily living and functioning at home and work places. PMS occurs during the luteal phase of menstrual cycle

Frequent symptoms include anxiety, irritability, mood swings, fatigue, palpitations, crying, forgetfulness, fluid retention, weight gain and breast tenderness. Lifestyle changes that may help to decreased sodium, redefined sugar content, decreased alcohol and caffeine intake ;calcium, exercise, relaxation technique and increased rest. Lifestyle changes like diet, stress and exercise influencing PMS.

Etiology

- Prior affective disorder such as major depression or postpartum depression is often associated with PMS.
- Identical twins have a high concordance for PMS.
- Abnormal level of oestrogenor progesterone.
- Effect of ovarian hormones on central Nervous system neurotransmitter that affect mood, behaviour, cognition.
- Altered prolactin and thyroid secretion.
- Low level of beta endorphins.
- Abnormal production of prostaglandins
- Increased adrenal activity.
- Fluid imbalance.
- Nutritional deficiencies, vitamin deficiencies, hypoglycaemia

Risk Factors

- High caffeine intake
- Stress may precipitate condition
- Increasing age
- History of depression
- Family history
- Dietary factors (Low levels of certain vitamins and minerals, particularly magnesium, manganese, and vitamin E) and also Vitamin D

Symptoms

Physical symptoms

- Headache/migraines
- Bloating



- Breast tenderness and swelling
- Hot flushes
- Muscles and joint pain
- Fatigue
- Appetite changes
- Sleep changes
- Edema
- Weight gain
- Carbohydrate cravings
- Abdominal/pelvic discomfort
- Altered bowel habits
- Dizziness
- Palpitations
- Acne/skin blemishes
- Nausea
- Backache
- Psychological Symptoms
- Depressed mood
- Tension
- Sleep disturbance
- Changes in libido
- Feeling of hopelessness
- Marked anxiety
- Tearfulness
- Irritability and anger
- Emotional lability
- Reduced interest in activities of living
- Feelings of being out of control
- Lethargy

Behavioural Symptoms

- Agoraphobia
- Absenteeism from work
- Poor work performance
- Social withdrawal
- Difficulty with personal relationships
- In extreme cases criminal behaviour, suicide attempts

Criteria for the diagnosis

- Signs and symptoms must be cyclic and occur in the luteal phase of menstrual phase.
- Women should be symptom free during follicular phase of menstrual cycle and must include seven symptom free days.
- Symptoms must have an effect on work, lifestyle and relationship.
- Diagnosis must be based on prospective symptom characterized by women.
- Diagnosed by the presence of physical, behavioural and psychological symptom

Management

Pharmacological management

- Aldactone 50-100 mg per day helps in reducing fluid retention and weight gain.

- Migrane related to menstrual cycle are treated with NSAIDS
- Peridoxin 100 mg twice daily to correct depression.
- Frusemide 20 mg for consecutive 5 days helps in the reduction of fluid retention.
- Fluoxetine 20 mg helps to improve psychiatric and behavioural symptom.
- Oral contraceptive pills continued to 3-6 cycle.
- Progesterone (5th day of cycle for 20 days)
- Levonorgestrol used to suppress ovarian cycle.
- Bromocriptine 2-5 mg twice daily in relieving breast complication
- Suppression of ovarian cycle by dainzol 200-400 mg.
- Selective serotonin Reuptake Inhibitions –Antidepressants-good relief for mood symptoms.
- Prostaglandin Inhibitors-administration 2-4 times daily at onset of symptoms.
- Diuretics-administration during luteal phase.
- Tranquilizers, gonadotropic inhibitor

Non pharmacological management

Diet

Diet is another vital factor in maintaining optimum health. Dietary changes influences premenstrual syndrome.

Vitamins

Vitamin rich foods are essential for relieving Premenstrual syndromes

- Vitamin A is effective in controlling premenstrual oily skin and acne
- Vitamin B6 (pyridoxine helps in relieving mood disorders and excessive dose cause peripheral neuropathy). Dose of vitamin B6 is 100-150 mg per day.
- Supplementation of vitamin E (400 IU per day) helps in reducing production of prostaglandins, that cause cramps and breast tenderness.
- Vitamin D (400 IU per day) helps in reducing PMS.

Minerals

- Minerals are influencing premenstrual changes.
- Supplementation of calcium (calciumcarbonate) 1200 mg per day reduce physical and psychological symptoms of PMS.
- Magnesium 200-400 mg per day helps to reduce fluid retention, Breast tenderness, Bloating.
- Zinc also effective in controlling premenstrual oily skin, acne and mental and emotional problems.sa
- Manganese helps in carbohydrate metabolism, deficiency causes nervous tension, fatigue and tiredness. Supplementation of 11 mg/day is essential

Carbohydrates

- Carbohydrates increase in the synthesis of serotonin levels.
- Three small to moderate sized meals and three small snacks a day that are rich in complex carbohydrates and fibre helps in relieve PMS

Tips for Relieving PMS

- Skipping meals and eating junk food is likely to aggravate symptoms.
- Decreased consumption of caffeine (coffee, tea, colas, chocolate) which increase irritability, insomnia, anxiety and nervousness
- Avoid simple sugars (cookies, cake, candy) to prevent high blood glucose followed by a rapid decline and a period of low blood glucose (hypoglycaemia). Limit consumption of redefined sugar (<5 teaspoon per day), salt <3 gm per day, red meat 30 oz per day.
- Decrease intake of salty foods (chips, pickles) to reduce fluid retention.
- Drink at least 2000 ml of water per day.
- Include whole grained vegetables, seeds, nuts fruits, vegetables fruits and vegetable oils in their diet.
- Avoid alcohols which aggravates depression.
- Numerous vitamin and mineral deficiencies have been linked to PMS.

Stress

- Avoid stressful situation
- Abdominal breathing, mental imagery progressive muscle relaxation helps in reducing stress.
- Warm bath and massage helps in reduce stress
- Relaxation techniques are helpful tools for coping with stress.

Types of relaxation techniques

There are different types of relaxation techniques:

Autogenic training

This technique uses both visual imagery and body awareness to move a person into a deep state of relaxation

Breathing

In breathing techniques place one hand on the chest and the other on your belly.

Progressive muscle relaxation

This technique involves slowly tensing and then releasing each muscle group individually.

Meditation

The two most popular forms of meditation include Transcendental Meditation (students repeat *amantra*-- a single word or phrase) and mindfulness meditation (students focus their attention on their thoughts and sensations)

Exercise

Exercise helps lower blood pressure and cholesterol, reduces risk of heart disease, helps prevent osteoporosis, helps protect you from certain cancers, improves your strength and mobility, and helps you lose and maintain weight. Exercise can also reduce your PMS symptoms

Aerobic Exercises

Aerobic activities such as jogging, swimming walking etc.

Regular aerobic exercises 3-4 times a week especially in the luteal phase increase beta endorphin level to offset the symptoms of depression and elevate mood. Aerobic exercises increases oxygen in the blood and raises serotonin levels it helps in reducing anxiety, depression and lose weight.

MINDFULNESS-BASED INTERVENTIONS

Definition

Mindfulness-based interventions (MBIs) are structured, evidence-based programs incorporating meditation and non-judgmental awareness to treat biopsychosocial conditions like stress, anxiety, and depression. Common approaches include MBSR and MBCT, usually featuring eight weekly group sessions with guided meditation, body scans, and daily practice to improve emotional regulation and well-being.

Types of Mindfulness-Based Interventions

- Mindfulness-Based Stress Reduction (MBSR): Developed by Jon Kabat-Zinn, this 8-week program uses meditation and yoga to treat stress, anxiety, and chronic pain.
- Mindfulness-Based Cognitive Therapy (MBCT): Combines MBSR with cognitive behavioral techniques, specifically designed to prevent relapse in depression
- Mindfulness-Based Relapse Prevention (MBRP): Tailored for addiction recovery by fostering awareness of triggers.
- Mindfulness-Based Eating Awareness Training (MB-EAT): Helps treat eating disorders by fostering awareness of hunger and satiety.

Key benefits and applications

MBIs are effective tools for managing a broad range of conditions by changing how individuals respond to thoughts and physical sensations:

- Mental Health: Significant reduction in symptoms of depression, anxiety, and psychological distress.
- Physical Health: Used to manage chronic pain, reduce insomnia, improve immunity, and lower blood pressure.
- Adolescents and Children: Helps manage negative emotions, improve attentional focus, and manage school-related stress.
- Well-being: Promotes self-compassion, self-regulation, and better social functioning

Common techniques used

MBIs promote present-moment awareness through several core practices

- Body Scan: Mentally scanning the body for tension, starting at the head or feet.
- Focused Breathing: Concentrating on the breath to anchor attention in the present moment.
- Mindful Movement: Gentle yoga or walking to connect with bodily sensations.
- Grounding Techniques: Such as the 3-3-3 rule (3 things you see, hear, and touch) to reduce immediate anxiety.



CONCLUSION

Mindfulness-based interventions (MBIs) are effective in reducing the severity of physical, psychological, and behavioral symptoms of Premenstrual Syndrome (PMS) among adolescent girls and young women. Systematic review findings suggest these interventions, such as MBSR and MBCT, significantly lower anxiety, depression, and pain while improving happiness and quality of life. Mindfulness-based programs can be effectively incorporated into health education and clinical practices to help adolescent girls manage menstruation-related issues.

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