

## Effectiveness of group cognitive-behavioral therapy on symptoms of premenstrual syndrome (PMS)

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**Objective:** Standards of care and treatment of premenstrual syndrome (PMS) vary. Non-drug psychosocial intervention therapy is recommended for women with any kind of discomfort or distress caused by PMS. The current study examined the effectiveness of group cognitive-behavioral therapy on the symptoms of PMS at a girls' dormitory of North Khorasan University of Medical Sciences.

**Method:** In this quasi-experimental study, 32 female students with PMS who were majoring in nursing and midwifery and residing in the dormitory were selected using the convenience sampling method and were assigned to experimental and control groups. The Standardized Premenstrual Symptoms Screening Tool was used as the research tool. Eight sessions of cognitive-behavioral group therapy were held for the students

**Results:** There was a significant difference in psychological symptoms before and after cognitive-behavioral therapy ( $p=0.012$ ). Furthermore, cognitive-behavioral therapy was effective on social interferences caused by PMS symptoms ( $p=0.012$ ).

**Conclusion:** Group cognitive-behavioral therapy effectively alleviates PMS symptoms in female college students.

**Key words:** *cognitive-behavioral therapy, group therapy, premenstrual syndrome (PMS)*

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**P**remenstrual syndrome, or PMS, is a universal phrase present in all cultures and has been the subject of attention for many biomedical researchers (1). PMS is a disorder that affects the lives of millions of women from menarche to menopause (2). This syndrome consists of a wide range of physical, psychological, and behavioral symptoms that do not result in any organic disease, occur regularly during the luteal phase of each menstrual cycle, and resolve as menstruation ends. The severity and chronic nature of PMS has led to the prevalence of this disorder in women and disrupts their work, family relationships, and daily activities (3). Over 90% of women experience PMS in their reproductive years. In addition, 10% experience premenstrual dysphoric disorder (PMDD), a severe form of PMS. (4, 5) In the

United States, 28 million women suffer from PMS, and 6 million are affected by PMDD (6). Ramezani Tehrani (2013) studied 18- to 45-year-old women in Iran between the years 2009 and 2011 and reported the prevalence of PMS as 52.9%, of which 34.5% suffered from its severe form (7). Women experience more than five hundred menstrual cycles during their reproductive years. These cycles have various symptoms, including depression; changes in mood, behavior, and feeling of well-being (including mental image); food cravings; abdominal pain; breast tenderness; headache; and fatigue. These symptoms intensify 4 to 7 days before menstruation, and women are likely to suffer from these symptoms on particular day's for 4 to 10 years. Like other major mood disorders, PMS and PMDD make a person incapable of

leading an organized life. Since PMS is associated with mental disorders, there is a need for effective therapeutic interventions (6, 8). The Royal College of Obstetricians and Gynecologists and the National Association for Premenstrual Syndrome (NAPS) published clinical practical guidelines for the management of PMS (9, 10). In these guidelines, patients record their PMS symptoms for at least two or three cycles in a questionnaire diary. Appropriate treatments are then selected based on the recorded symptoms. Cognitive behavioral therapy is recommended in patients with moderate to severe PMS and mood, emotional, and physical symptoms (11).

Cognitive-behavioral psychotherapy includes limited weekly sessions conducted by a psychotherapist focusing on modifying negative and abnormal thoughts and training individuals in effective adaptive mechanisms. The benefit of psychotherapy is that its effects are achieved through time; even when psychotherapy sessions come to an end, their effects remain. Conversely, pharmacotherapy has a very rapid effect, but it ends with the discontinuance of the drug (12). Cognitive therapy focuses on cognitive concepts, cognition related to the inner perception process, memory, and judgment with which a person perceives herself and the world around her, and cognitive interventions that help change or rectify individuals' thinking patterns which have been shaped over time. Such thinking patterns often interfere with individuals' abilities and optimal performance. The skills and techniques used in cognitive-behavioral therapy (CBT) are models which investigate and determine the relationship between thoughts, feelings, and behavior. In CBT, it is assumed that individuals are not disturbed by an event itself; rather, it is the individual's perception of that incident which is harmful. As long as an individual believes something, she will nurture and develop that belief. Work and practice can modify beliefs that create difficulties in life (13). In 2011, Nazari et al (14) indicated that anxiety is the most common symptom of PMS. According to this study, group CBT is able to free target individuals from distress and confusion through planning and organizing, thus reducing anxiety. The individual avoids disturbing thoughts that cause anxiety and comes to believe herself as a person who has certain abilities and shortcomings. Moreover, avoiding hidden defects reduces the expectations an individual has of herself and others. Results of this study showed that irritability is reduced through CBT. Recent studies (15-17) have shown that a combination of different treatments is much more effective than single treatment methods. Non-pharmacological treatment of chronic disorders is of particular importance, especially in adolescents. One can greatly benefit from counseling techniques through which the client is helped to identify his problem and, after becoming familiar with the unknown, he proceeds to analyze his problem and choose a solution. Adolescence and youth are the most common periods for the start of PMS symptoms. Given

the negative effects PMS has on psychological, physical, and mood dimensions of this critical period in the life of girls, the first step for its prevention and for the promotion of physical and mental health in these individuals is to increase their awareness by developing and spreading extensive, organized programs. Based on the mentioned studies and witnessing PMS symptoms among dormitory girls and their indiscriminate use of medication, the current study was carried out with the purpose of reducing PMS symptoms in female students in the dormitory of North Khorasan University of Medical Sciences through group CBT.

## Materials and Method

In this quasi-experimental study was conducted at North Khorasan University of Medical Sciences in the second semester of the 2011-2012 academic year. The study population was female students living in the dormitory and majoring in nursing, midwifery, etc. Thirty-two students with PMS were selected through non-probability convenience sampling upon acquiring the Ethics Committee's authorization (coded 90/p/380 on 10/2/2011) after the tenth meeting and after obtaining informed consent from the participants. The sample was then divided into control and experimental groups. Error type I was considered equal to 0.05 and error type II to 0.20 (P1:0.8, P2: 0.4). Thus, 16 individuals were selected for each group. The Premenstrual Symptoms Screening Tool (PSST), originally developed in 2003 by researchers at McMaster University to screen individuals with severe PMS or PMDD or those who may benefit from treatment, was used in this study. This quick and reliable tool screening operationalizes classified DSM - IV criteria (18-20). It has two parts. The first part consists of 14 items which measure emotional, physical, and behavioral symptoms. The second part measures the impact of these symptoms on the lives of individuals through 5 items, each of which has four options rated on a Likert scale - not at all, mild, moderate, or severe symptoms - scored from 0 to 3. The following three conditions should be met for the diagnoses of moderate to severe PMS:

At least one of the first 4 items rated severe;

In addition to the previous item, at least four items from questions 1 to 14 rated moderate to severe;

At least one of the five "functional" items (last 5 items) rated moderate or severe. Hariri et al. evaluated the validity and reliability of this test in Iran with Tehran University of Medical Sciences students who reside in dormitories. The reliability of the questionnaire obtained a Cronbach's alpha coefficient of 0.9. Content validity and content validity index values were 0.7 and 0.8, respectively (21). First, the PSST was distributed among students. After individuals with moderate to severe symptoms were identified, those with a score of 16 or higher were selected. After obtaining informed consent, individuals were placed in experimental and control groups. The experimental group was given

explanations regarding their duties, rights, privileges, and limitations. The experimental group received 8 to 12 ninety-minute group therapy sessions which were held once a week from 8:00 to 9:30 pm in one of the classrooms at the School of Nursing and Midwifery. The group therapy sessions took approximately 3 months to finish. Members were approximately the same age and majoring in nursing or midwifery. Rights of the members included:

Personal information should remain confidential and safe;

Group members should have access to the group leader and assistant leader;

Members should be able to talk in private;

Members should not face any obligation for entering the group;

Members have the right to actively participate in group activities.

In the recruitment stage, the leader and assistant therapist were careful to choose members who, in addition to having the conditions of PMS, were interested in change and understood the group's objectives. The reason for their selection for group therapy was explained to individuals. Members paid no tuition or any other costs for group therapy sessions. In each session, the practice sheets and assignments were given to members free of charge. After finishing one session and starting the next (with a week between the two), individuals had to note down their actions and activities and bring it along with themselves to the next session. In group therapy sessions, the group leader was not the only person to talk; rather, all members had to cooperate and participate actively in the sessions. Each person talked about her experience with PMS, her thoughts and feelings at the time, and the useful experience she had in encountering and reducing the intensity of these symptoms intensity. Participants received training in at least 12 cognitive-behavioral techniques throughout the course. During the last 30 minutes of each session, the group leader gave a general summary of the issues discussed and gave the necessary instructions for the assignments. Table 1 shows the treatment protocol. Data was analyzed using statistical indicators along with Friedman statistical tests, and Wilcoxon signed-rank test were used in SPSS version 19.

## Results

This research was carried out on 27 female students who were eligible for the study. This number included 14 individuals in the intervention group and 13 individuals in the control group. Participants had a mean age of 21 years with a standard deviation of 0.79 and a median age of 21 years. Table 2 shows the significant improvement in psychiatric symptoms experienced by the intervention group after intervention compared with before intervention. No such change occurred in the control group. No significant relationship was seen between the two

groups in terms of psychological symptoms before or after the intervention (Table 3). Table 4 shows that the symptoms of social interferences were significant in both groups before and after the intervention ( $p < 0.05$ ), and Table 5 shows no significant relationship between individuals' ages and the various conditions of PMS symptoms ( $p > 0.05$ ).

## Discussion

In this research, training was carried out with cognitive-behavioral group therapy based on the principles of cognitive, emotional, and coping mechanisms. Treatment was based on presenting information on such topics as relaxation, massage, nutrition, lifestyle change, regular physical exercise, and stress management. The study's findings show that training with the group cognitive-behavioral therapy approach was effective on the psychological symptoms of PMS in the experimental group. A significant difference was seen between the trained experimental group and the control group. In addition, the present study indicated that group cognitive-behavioral therapy is effective on the social interferences caused by PMS; however, no significant effect was found on the physical symptoms of PMS. These results were in line with similar studies carried out by Christensen et al. in 1994 (22), Blake et al. in 1998 (23), Busse et al. in 2009 (24), Hofmann et al. in 2012 [23], Taghizadeh et al. in 2010 (15), Hossein Nazari et al. in 2011 (14), and Mirzai et al. in 2012 (25). These studies also revealed an improvement in some psychological symptoms of PMS such as anxiety, depression, negative thoughts, and physical changes. Furthermore, a 2011 study by Navabinejad et al. (16) examined the effects of group cognitive-behavioral therapy on the physical symptoms of PMS in married women. Its results suggested that CBT should be used to increase family efficiency and reduce marital conflicts related to the menstrual period. The 2012 findings of Mirzaie et al. (25) indicated that cognitive-behavioral stress management is effective in reducing symptoms such as anxiety in women with PMS, but not on physical symptoms. This study concluded that interventions in the form of drug therapy and physical activity are able to reduce the physical symptoms of PMS. Since PMS symptoms are caused by hormones and neurotransmitters, psychological treatments such as stress management cannot prove effective in alleviating physical symptoms. In the present study, the measurement of changes in physical symptoms was expressed through a single question which students evaluated on a Likert scale. Thus, the researchers believe that not being able to differentiate physical symptoms prevented students from correctly evaluating and stating them. In investigating the frequency of symptoms, a reduction before and after interventions was found. It cannot be definitely asserted that cognitive-behavioral therapy has no effect on physical symptoms of PMS. In addition, there is no single,

accepted treatment across the globe for PMS. Previous studies have not shown consistent results. Many clinical trials were not well-controlled and have listed various methods for controlling the symptoms of PMS. It may be helpful if the symptoms of stress are taken into consideration in psychological counseling, such as cognitive-behavioral therapy or group therapy (23). In the current study, the positive effects of cognitive-behavioral treatment on emotional and psychological symptoms of PMS are justifiable. Based on the cognitive-behavioral theory, disturbing thoughts and cognitive impairment lead to depression and stress. PMS symptoms may be intensified and prolonged by the vicious cycle of negative thoughts (low mood, low self-esteem, and lack of self-control) that women experience in the premenstrual stage. One of the main strategies for making cognitive-behavioral therapy more effective is to offer treatment in the form of group therapy (5, 26 and 27). In the present study, the researchers tried to provide individuals with techniques for identifying, challenging, and changing negative cognitions and inhibiting automatic thoughts through 8 sessions of training. Carrying out the assignments was one of the important aspects of this program. When a skill was presented with the assistant therapist, individuals were expected to spend time at home working on other aspects of their thinking and to use the proper technique in response to mood symptoms that occur. The group leader set up each session in a way that members could express their feelings and that enabled her to present participants with the necessary training. The group leader had to establish a sense of security and confidence in individuals so that they could self-disclose and express their feelings without anxiety. Cognitive behavioral therapy was conducted with the assumption that students in dormitories are more susceptible to environmental and emotional stressors such as economic difficulties, special dorm circumstances, inconsistencies, and personal conflicts. These issues intensify students' mood symptoms. Since the participating students were majoring in medical science fields, there was a higher possibility for self-medication (28). Although the present study analyzed the effectiveness of group cognitive-behavioral therapy on PMS symptoms, there was no follow-up on the group CBT's lasting effects after the completion of sessions, and the treatment method was not compared with other forms. Hunter et al. (26) in 2002 studied the effectiveness of cognitive-behavioral therapy (ten sessions) and Fluoxetine (20 mg) and combination therapy (Fluoxetine and cognitive therapy) in women with premenstrual disorders. His results showed that a distinct improvement with all three kinds of therapy had occurred after 6 months. In addition, patients who received Fluoxetine experienced a quicker recovery. Follow-up on the three groups showed no differences in terms of the betterment of premenstrual disorders. However, it did reveal that cognitive-behavioral therapy had more lasting effects than Fluoxetine

therapy. To clarify, Fluoxetine and cognitive-behavioral therapy both have equal treatment effects, but differ in terms of long-term effects. This can be effective in deciding which type of treatment to choose. No added advantage was observed in combination therapy. Ghaedi et al.'s (29) research in 2011 reported no reduction in mean physical symptoms of the experimental and control groups after an 8-week follow-up, but mean psychological symptoms were significantly lower in the experimental group than the control group. Thus, many studies (13, 22, 23 and 25) suggest that further experimental research must be carefully conducted with smaller groups under controlled conditions in order to devise a tool that can assess the experiences of women with PMS-related disorders.

## Conclusion

The results of the present study indicate that cognitive behavioral training can be a useful skill for dealing with psychological symptoms caused by PMS. Other studies also show that this kind of treatment is effective on the physical symptoms of PMS. CBT gives female students new insight into themselves, their symptoms, and the individuals around them, reinforcing their ability to identify solvable problems and helping them become successful in better controlling their lives. This type of treatment is rarely available, but it is the right choice for students suffering from PMS symptoms who cannot tolerate drug therapy or for students who use non-prescribed medication.

## Limitation

Some limitations of the current study included the chance that some participants may not express their problems and some samples might withdraw from active participation in group therapy. The researchers attempted to minimize these limitations by using counseling skills and providing their e-mail addresses and contact numbers to participating students for special cases. A similar research with a long follow-up is recommended to evaluate the medium-term and long-term effects of cognitive-behavioral group therapy.

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## Conflict of interest

There were no conflicts of interest.

**Table 1: Cognitive behavioral therapy approach in managing symptoms of premenstrual syndrome**

<b>Session 1</b>	Introduction of therapist and group members. Students filled out questionnaires. Therapist gave a description of PMS; elimination of signs and symptoms; therapeutic agents; outcomes and impacts; the role of environmental stressors and psychological factors. <b>Assignment:</b> Fill out forms on PMS
<b>Session 2</b>	Description of group therapy, cognitive-behavioral interventions, duties and norms; description of group meeting to increase motivation and group cohesion; description of group objectives, determining behavioral changes, encountering initial anxiety of group members; opening up resistance and promoting self-disclosure. <b>Assignment:</b> Record moods one week before start of menstrual cycle, and note down physical changes caused by moods.
<b>Session 3</b>	Evaluation of automatic thought and cognitive distortions; emotional reasoning, generalized extreme, discussion and analysis of anxiety, depression, and symptoms that occur periodically. Reviewing the basis of specific experiences by retaining confidentiality and providing feedback. <b>Assignment:</b> Detect thoughts, moods and behaviors experienced in different life situations and identify which parts of those experiences need to be changed.
<b>Session 4</b>	Training members on emotional reactions and their relation to internal dialogue; exploring situations; having a broader and more objective perspective; dealing with resistance, tension, and anxiety. <b>Assignment:</b> Consider a recently experienced mood, identify moods during or immediately after it, and observe and classify mood swings.
<b>Session 5</b>	Explain, interpret, and describe the relationship between situation and emotion; awareness of situations and thoughts that relate to mood changes; describe thoughts, beliefs, concerns, perceptions, and concepts related to situations. <b>Assignment:</b> Note down support for the inaccuracy of "hot thoughts". Gather evidence to confirm or reject a hot thought.
<b>Session 6</b>	Evaluating thoughts and challenging them; role playing in the group to reform and challenge automatic thoughts; analyzing behavioral changes in various situations; assessing personal responsibility; identifying main beliefs. <b>Assignment:</b> Test new experiences, experiments and practical plans.
<b>Session 7</b>	Identifying underlying principles and assumptions; therapeutic interventions; identifying worries and their benefits and harms; investigating ways to manage negative events of the past; identifying and classifying violent thoughts and emotions associated with them; mental imagery. <b>Assignment:</b> Fill out the Metacognitions Questionnaire
<b>Session 8</b>	Treatment of depression; cognitive restructuring; improving interpersonal relationships; timed schedule of activities; recording weekly activities; taking a lesson from these schedules; understanding anxiety ,its characteristics, and cognitive aspects; practicing relaxation, controlled breathing, visualization, and distraction; understanding anger, guilt and shame; anger restraint methods; assertiveness training; overcoming feelings of guilt.

**Table 2: Relationship between psychological symptoms scores before and after of intervention in two groups (cognitive behavioral therapy and control)**

Group	Score on psychiatric symptoms	Mean and standard deviation	P value
Cognitive-behavioral therapy	Before intervention	6/47±20/4	0/012*
	After intervention	5/68±16/1	
Control	Before intervention	4/42±21/5	0/552
	After intervention	8/03±19/6	

\*Significant at 0.05 level

**Table 3: Comparison of Mean and standard deviation of psychological symptoms of premenstrual syndrome in Cognitive-behavioral therapy group with control group**

	Cognitive-behavioral therapy group	Control group	P value
Mean and standard deviation before intervention	20/4±6/47	21/5±4/42	0/884
Mean and standard deviation after intervention	16/1±5/68	19/6±8/03	0/233

**Table 4: Comparison of Cognitive-behavioral therapy and control group in terms Psychological symptoms of Premenstrual syndrome and social interferences scores**

Group	Social interferences score	Mean and standard deviation	P value
Cognitive-behavioral therapy group	Before intervention	3/43±7/35	0/012
	After intervention	2/16±5/28	
Control	Before intervention	2/19±9/15	0/03
	After intervention	4/04±6/69	

\*Significant at 0.05 level

**Table 5: Relationship between age of participants and psychological symptoms of Premenstrual syndrome scores in before and after intervention**

	Age (correlation value)	P value
Psychological symptoms score before intervention	0/070	0/771
Psychological symptoms score after intervention	-0/162	0/496

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