Review

Evaluation and comparison of the effects of various cognitive-behavioral therapy methods on climacteric symptoms: A systematic review study

CBT methods and climacteric symptoms

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Abstract

Objective: The climacteric syndrome related to many symptoms often causes discomfort in women. Non-pharmacological treatment is one of the treatment options for these individuals, and this syndrome can be cured with psychological treatments such as CBT. The present study aimed to compare the efficacy of various CBT methods on the improvement of climacteric symptoms.

Materials and Methods: PubMed, Scopus, Cochrane, Medline, PsycINFO, and Google Scholar were searched for the relevant articles published within January 1990 and August 2018. Data extraction and quality assessment were conducted by two authors.

Results: A total of 15 articles including 910 women were entered. We divided the CBT methods into two categories, face-to-face (individual and group CBT) and indirect (self-help CBT) methods. Among the three types of CBT approach, three articles pointed out individual CBT, nine articles carried out group CBT and in five articles, we could find the self-help approach. The climacteric symptoms improved by CBT were categorized into three groups of vasomotor symptoms, psychological symptoms, and organic disorder. Generally, the face-to-face method played a key positive effect on symptom improvement, and the group CBT approach was more effective on psychological symptoms.

Discussion: Although the indirect method is more cost-effective, it has less impact than the face-to-face method, and, it is better to utilize face-to-face approaches to achieve a better result, if possible. Further studies are required in this regard, particularly in the individual and self-help CBT approaches and will measure the impact of these approaches on more varied symptoms of menopause.

Introduction

Climacteric and menopause are closely related concepts; however, they do not denote to exactly the same thing. Climacteric is the process of aging in women, including three periods. The first stage is "peri-menopause" occurring within one and eight years before beginning of menopause. A series of gradual changes occur during this period. The second period is "menopause", which is confirmed by having experienced a year of amenorrhea, and the "postmenopausal" stage, which is the third phase, begins when menopause is confirmed and lasts until old age (1). From a practical point of view, the word "menopause" globally refers to the aging process of the ovary and includes any period of peri-menopausal and postmenopausal in women (2).

The climacteric period can be associated with the symptoms on four different classifications: 1. Vasomotor vegetative symptoms (hot flashes, night sweats, palpitations, etc.); 2. Psychological symptoms (anxiety, depression, nervousness, insomnia, decreased libido, memory loss, melancholy, fatigue, etc.); 3. Organic disorders (osteoporosis, cutaneous atrophy, urogenital atrophy, arthralgia, myalgia, etc.) and 4. Metabolic disorders (obesity, arterial hypertension, etc.). The pathogenesis is related to a decline in sex hormone concentration, particularly the decrease in estrogens (3, 4). Moreover, some factors such as genetic and lifestyle factors, psychological disposition and personal attitudes as well as educational background (5), have a key impact in experiencing menopause in the climacteric period in women (6). The average age of menopause is 51 years (7), and the age of menopause remains constant in spite of the increased life expectancy in women. Therefore, with an increase in life expectancy, women after menopause spend about one-third of their lives and they are struggling with the problems caused by menopausal symptoms (8). As expressed by women, they consider menopause "the beginning of new phase of life", "unsatisfaction in a sexual act" and "change in the physical and mental health"(9). Thus, performing therapeutic interventions is essential to reduce the negative effect of the climacteric syndrome on lifestyle.

Hormone Replacement Therapy (HRT) is the most extensively used treatment for the main symptoms of menopause, causing 70–90% reduction of the symptoms (10). While HRT has been the treatment choice for the climacteric syndrome for many years, uncertainty about its benefits and costs has emerged since the publication of the Women's Health Initiative's results (WHI) (11). Many women prefer non-medical treatments for menopausal symptoms (12) and they are always worried about the side effects and possible long-term health risks of HRT (13). A strong and convincing evidence exists indicating that the long-term risk of using estrogen and progestin to avoid postmenopausal diseases is far further than its benefits (11). These results have challenged health providers to find alternative treatments for menopausal women (14). The evidence base for non-medical treatments is being increasingly examined with mixed results (4, 13- 22). In addition, there has been considerable interest in developing the effective nonmedical interventions to help women manage menopausal symptoms (4, 17, 19, 23).

Considering physical and psychological problems occurring in this period, it seems that non-medical therapies helping women to deal with their problems, particularly psychological therapies will be useful. Cognitive behavioral therapy (CBT) is one of the effective methods (24, 25, 27). Nowadays, CBT is utilized in the management of many conditions like anxiety, depression, phobia, and stress (26). Cognitive behavior therapy-based psychological treatments were developed as treatments for menopausal disorders (21). This therapy helps to think differently and due to this new thinking, she can confront undesirable events with more acceptable behaviors (27, 28). In recent studies, cognitive behavioral treatment, including psychoeducation, paced breathing/relaxation, and cognitive behavioral therapy (CBT), can help women to manage symptoms such as HF/NS, which was acceptable to women, showed promise in exploratory trials of individual and group CBT, and reduced the symptoms (14, 17, 29).

Various CBT methods (group, individual and self-help CBT) were implemented in the climacteric period in several trials on the health of women.

The present systematic review aimed to compare the efficacy of various methods of CBT on the improvement of the climacteric symptoms.

Materials and Methods

Search strategy

The current systematic literature review was performed using electronic databases such as PubMed, Scopus, Cochrane, Medline, PsycINFO, and Google Scholar. The search was performed from January 1990 to August 2018 by using the following related keywords in titles and abstracts (women OR female) AND (menopause* OR peri-menopause OR "post menopause") AND (climacteric treatment OR therapy OR "cognitive behavioral therapy" OR CBT OR "psychological treatment symptom) AND ("hot flashes" OR sweat OR anxiety OR depression OR insomnia OR "menopausal symptoms" OR "climacteric syndrome).

Moreover, reference section of relevant trials, systematic reviews and meta-analyses were manually checked to recognize the related trials missed by electronic databases search.

Two authors independently conducted the search and screened studies for the inclusion criteria; first of all, the authors independently extracted data and then checked the extracted data. Any discrepancies were resolved via discussion and consensus.

The following data were extracted with the use of PICOS criteria: population (e.g. sample size, women with natural menopause), intervention (e.g. various CBT methods: group, individual and self-help CBT, duration, length of program), comparison (e.g. non-CBT therapy group or no treatment control), outcomes (e.g. reported in the form of the improvement scores of climacteric symptoms), study design (e.g. RCT, clinical trial, quasi-experimental etc). So the data were extracted and classified under the following headings in systematic tables: author, country, year to establish a historical timeline, study design, sample size, specifications of population, comparison condition, scale, intervention and main findings of the studies which can be reported in the form of scores and changes.

Inclusion and exclusion criteria

The inclusion criteria for entering the evidence in the current systematic review included the original and quantitative interventional studies in English or at least with an English abstract, which could offer adequate information regarding the impact of any kind of CBT methods on the improvement of the menopausal symptoms, which are published in peer-reviewed journals. Studies with randomized control trial, clinical trial, experimental, semi-experimental and pilot design were entered and the subjects of the studies were healthy women in the climacteric period with normal menopause (not because of surgery) and receiving CBT for the treatment of the symptoms.

The exclusion criteria included the qualitative and quantitative interventional studies without numerical outcome data, and observational, cohort, case-control, cross-sectional, retrospective, and prospective studies were excluded, as well.

Screening

A total number of 1628 articles were identified and imported to Endnote X8, and after removal of duplicates (N=415), we screened titles and abstracts of the remaining articles (N=1213). After evaluating the inclusion criteria in remaining papers, texts of 59 potentially relevant articles were fully assessed for more screening. These articles were evaluated for eligibility, and finally, 15 studies were entered in the current systematic review.

Based on the type of CBT interventions, the entered studies were classified into two groups, based on the type of CBT interventions; the first classification is the face-to-face CBT method, including individual and group CBT, and the second one is indirect CBT, containing the self-help CBT. In indirect method, the support is provided by a professional therapist by telephone, email, or any other communication tools.

Quality assessment

The quality of the studies was evaluated using the Cochrane Collaboration's tool to assess the risk of bias in randomized trials by two authors independently (27). In addition, the tool has six criteria assessed in the entered studies which are random sequence generation, allocation concealment, description of drop-outs, blinding of participants and personnel, power analysis, and intention-to-treat analysis or no drop-outs. One point was given for each criterion observed in each study. Based on this assessment tool, the quality of a study was evaluated as "high" when five or six criteria were observed, "moderate" when three or four criteria were observed, and "low" when fewer than three criteria were observed. Any disagreements between the two authors were discussed until consensus was reached and if any variation remained, it was settled through discussions with a third researcher.

Results

From all the related papers, based on the title and abstract screening, we can observe the inclusion criteria in 15 studies. Figure 1 represents a flow diagram of PRISMA.

Characteristics of the included studies

A total of 15 articles were published between 1996 and 2018. Among all the final articles, the designs of most studies (N=8) were randomized control trial (17,19,20,21,31,32,33,35), three of them were pilot studies (4,14,34), one of the remaining articles has a randomized clinical trial design (36) and two studies were a clinical trial (33,35), we also have a quasi-experimental design in all the articles (23). Among the articles, two articles of Khoshboii et al. and Hassan et al. (31, 32) were obtained from the findings of one research and had similar results.

Demographic characteristics of subjects

According to the total number of subjects in all entered studies, 910 women were entered in current systematic review. The sample size of study population per study varied from 8 to 140 women and the age range of the participants in the articles was assessed from 35 to 71 years.

Women involved in these studies were fairly healthy, mostly married or cohabiting and had at least one child. Educational level was divided between those educated up to lower than primary school education; the majority had at least elementary education and housekeeping (4, 17, 19, 21, 34, 35, 37). All of the participants were employed in one study (36). In two of the studies, the demographic variables were not described completely (14, 33).

Methods of recruitment

Six studies recruited participants from health centers (17, 21, 31, 32, 33, 35), three through Women's Health Clinic (4, 23, 34), and five studies through general practices, breast screening clinics, menopause web site and local newspaper advertisements (14, 19, 20, 37, 38) and finally, one study recruited participants from public and private sectors (36).

The following scales were used in the entered studies to assess the symptoms changes: Insomnia Severity Index (ISI), BDI-II Questionnaire, Women's Health Questionnaire (WHQ), the Depression, Anxiety, and Stress Scale (DASS-21), Blatt's Kupperman Menopausal Index (BKMI), Hospital Anxiety and Depression Scale (HADS), HF/NS problem-rating (HFRS), Center for Epidemiologic Studies Depression Scale (CES-D), the Greene

Climacteric Scale (GCS), the Montgomery–Asberg Depression Rating Scale (MADRS), the Hamilton Anxiety Scale, Menopause Rating Scale (MRS) and the Hot Flashes Related Daily Interference Scale (HFRDIS). The number of studies based on their countries included 5 studies from the United Kingdom, 4 studies from the United States, 3 studies from Iran, 2 studies from Spain and 1 study from Switzerland.

Quality assessment

In total, the six quality criteria were assessed for 15 studies. The lowest score was 1 (four studies), and the highest score was 5 (three studies). The overall study quality was low, one study (6%) was rated with a high quality, six (40%) with a moderate quality, and eight (54%) with a low quality. The descriptions of the method were as follows: generation of the allocation sequence (sequence generation) was reported in zero studies; concealment of the allocation sequence (allocation concealment) was reported in 10 studies; blinding of the main outcome assessment was described in only five studies; in 10 studies, description of drop-outs was observed; a power-analysis was conducted in nine studies, and four studies had no drop-outs.

Table 5 provides the quality assessment.

Features of CBT sessions

Generally, in these articles, the CBT sessions were held to improve the following climacteric symptoms, which from the highest to the lowest level, are as follows: hot flashes and night sweats (HF/NS), depression, anxiety, insomnia, nervousness, melancholy, myalgia, vertigo, fatigue, irritability, headaches, palpitations, paresthesia, dysaesthesia, sleeping problem, cardiac complaints, sexual problems, urinary complaints, vaginal dryness, joint and muscle pain. In this respect, Table 1 presents the classification of these symptoms.

As earlier mentioned, in general, we divided the studies into two general classifications in terms of the CBT method (face-to-face and indirect), where the face-to-face method includes individual CBT and group CBT. Based on the studies reporting the individual CBT, this approach was conducted in the form of 4–6 sessions of one hour per 6–8 weeks. In general, group CBT sessions consisted of 4 to 16 sessions of 60 to 160 minutes, usually held weekly, and women were in groups of 4 to 12 people. All studies considering the self-help CBT as a subset of indirect CBT used a booklet and participants had to complete this protocol during a 4-week period, and two studies, in addition to the booklet, had 2-week telephone guide sessions.

Statistical analysis

To assess the effect of CBT methods on climacteric symptoms and to assess clinically meaningful individual change in symptoms, symptom changes scores were calculated as follows (mean difference):

$MD = \text{Pre-treatment symptom score} - \text{Last post treatment symptom score}$

For better comparison between all main results, and for not equalizing the score before the treatment in the studies, we convert the MD score to a percentage.

So the number in the table in the form of percent represents the decrease or increase in the severity of the symptoms after the treatment (compared to the initial score).

$\text{Percentage} = \frac{MD}{\text{Pre-treatment symptom score}}$

The effect of CBT methods on climacteric symptoms

a) The effect of evaluating each CBT approach on symptoms reviewed in studies

Hot flashes and night sweats (HF/NS) frequency

According to the finding:

Individual CBT was able to decrease the pre-test score of HF/NS frequency up to 59%.

Group CBT was successful in decreasing initial score of HF/NS frequency by 3.9 - 40%.

Self-help CBT could make a decline in baseline score of HF/NS frequency by 3.9 - 48%.

Hot flashes and night sweats (HF/NS) problem rating

Individual CBT could cause a 33% reduction from the baseline score of HF/NS problem rating.

Group CBT was able to make a 22–52% reduction in the pre-test score of HF/NS problem rating.

Self-help CBT was successful in decreasing the initial score of HF/NS problem-rating by 20 - 52%.

Hot flashes

Group CBT could make a decline in the baseline score of hot flashes by 11 - 57%.

Night sweats

The group CBT was not able to significantly reduce the night sweats. In the study by Kefeer et al. (13), the group CBT can reduce the night sweats up to 41% in the immediate group, but the score was about doubled in the delay group.

Depression

Individual CBT was able to make a 50 - 63% reduction in the pre-test score of depression. Group CBT was successful in decreasing the initial score of depression by 27 - 72%.

Anxiety

Group CBT could make a decline in the baseline score of anxiety by 18-71%.

Insomnia

Individual CBT could cause a 73% reduction from the baseline score of insomnia. Group CBT could not only make a considerable failure in the baseline score of insomnia, but also caused a 19% increase in the pre-test score. Self-help CBT was successful in decreasing the initial score of insomnia by 71%.

Nervousness

Group CBT was able to make an approximately 18% reduction in the pre-test score of nervousness in women.

Melancholy

Group CBT was successful in decreasing the initial score of melancholy up to 41%.

Cardiac complaints

Group CBT could cause a 42% reduction from the baseline score of cardiac complaints.

Sexual problems

Group CBT was able to make a 29% reduction in the pre-test score of sexual problems.

Vaginal dryness

Group CBT was able to reduce the pre-test score of vaginal dryness up to 29%.

Urinary complaints

Group CBT was not successful in decreasing the initial score of urinary complaints and the score in the follow-up period had a 10% increase of baseline.

Joint and muscle pain

Group CBT was successful in decreasing the initial score of joint and muscle pain up to 16%.

Myalgia, vertigo, fatigue, irritability, headaches, palpitations, paresthesia, and dysaesthesia; group CBT was unable to create a considerable decline in the follow-up score of each of them, separately.

b) *The effectiveness of the face-to-face CBT method*

To evaluate this method, first of all, we will find the impact of individual and group CBT approach according to Table 2 and our main findings mentioned above.

Individual CBT

Only three studies referred to this method, and if we determine which symptoms can be improved by this approach, hot flashes and night sweats (HF/NS) frequency in the vasomotor cluster can be pointed. Individual CBT can also play excellent roles on insomnia, which is classified in the category of psychological symptoms. Since few studies have evaluated the effects of individual CBT, the overall findings of this approach cannot be regarded.

Group CBT

Since only group therapy was carried out on each of the vasomotor symptoms separately, we could conclude that the group CBT could not be successful to recovery most of the vasomotor symptoms, and it just improved hot flashes

and cardiac complaints among seven symptoms of this classification. However, it can make the hot flashes and night sweats (HF/NS) problem to be rated better than the other approaches.

Most of the psychological symptoms (except insomnia) had a greater improvement in the group CBT approach, and only vaginal dryness in the organic disorder category could be under the effect of group CBT and most of them did not have significant positive changes. Generally, group CBT was more effective on psychological symptoms.

c) *The efficiency of indirect CBT method*

In this part, we examine the self-help CBT approach.

Self-help CBT

Self-help CBT approach has improved symptoms such as hot flashes and night sweats (HF/NS) frequency and problem rating, but the individual approach is more effective than it. Also this approach could have the same positive effect as individual therapy on insomnia.

Discussion

Considering the many studies conducted to improve the menopause symptoms by group CBT, we can point that in general, the treatment group has more favorable effects on psychological symptoms; however, considering the fact that apart from group therapy, other approaches have not been applied to psychological symptoms and owing to the good effect of individual and self-help CBT in depression and insomnia, the group CBT cannot be absolutely chosen as the best approach (31,32).

Moreover, limited studies were conducted on individual and self-help CBT and most of them have focused on hot flashes and night sweats (HF/NS) frequency and problem rating in each approach. Among these, individual CBT played a further role on HF/NS frequency, which due to the limited number of studies conducted using this approach, this part of our findings obtained from the results of one study cannot be generalized (17). Obviously, it is worth mentioning that the group and self-help CBT also played a positive and similar role on HF/NS frequency, which resulted from more studies (33-38).

According to three articles comparing the different approaches (19, 20, 32), two studies compared the effects of group and self-help CBT on hot flashes and night sweats (HF/NS) frequency and problem rating. The Group CBT treatment consists of psycho-education, stress management, paced breathing while Self-help CBT includes a self-help book that is learned during a four-week course and two phone calls taken by a psychologist. Both of them, as already mentioned, indicated an almost equal effect of the two approaches; however, the group CBT was somewhat more successful than the self-help CBT (19, 20), being consistent with our findings.

In the study of Khoshboi et al., the impacts of individual and group CBT on depression were compared to each other. The individual sessions are tailored to the needs of women and are flexible, but the general format of CBT sessions covered the main components such as; psycho-education, cognitive interventions, behavioral intervention, assigning homework and relapse prevention.

According to their findings, both approaches had the same effect on depression, and the effect of individual CBT was negligible more than group one (32). In addition, as mentioned earlier, both group and individual CBT had a positive and significant impact on depression but the findings from group therapy were more widespread (32,34, 35), which could be a result of the alterations in the conditions of the samples, the number of treatment sessions, the content or the kind of follow-up in studies; therefore, the group CBT cannot be a guaranteed approach, but if properly implemented, it can reduce up to 72% of the initial depression score; otherwise, it can only be up to 27% effective. Thus, the preliminary treatment approach for depression can be group CBT sessions held in good conditions.

Based on the findings of the present study, it can be concluded that if an individual has an insomnia problem, group CBT cannot produce a good result, but individual and self-help approaches can reduce over 70% of the initial insomnia score. Furthermore, in a study by Keffer et al., the intervention group was classified into two immediate and delayed treatment groups in the case of assessing night sweats, depression and total vasomotor symptoms. Treatment sessions were designed weekly and consist of education, relaxation training and cognitive restructuring.

In this regard, they reported a positive effect in the group with immediate treatment, but in the group whose treatment was delayed, the result was the opposite, and all of these three scores were increased; for example, the score for night sweats was higher than twice the initial score. According to this finding, the start of on-time onset of group therapy is noticeable, and if the treatment begins at a later stage, the result can be obtained in the opposite way (14).

Although in the study of Lorroy et al, the symptoms measured by the Kupperman and Blatt Menopausal Index questionnaire separately did not have a significant alteration after group CBT, but the total score represents a 20% decrease from the initial score, indicating the effectiveness of the group approach (4).

Study limitation

We weren't able to meta-analyze the present work due to the alteration in the questionnaires used to measure the symptoms, and the difference in the implementation method, including the number of treatment sessions or the number of participants in the group meetings. Moreover, as a result of the low and moderate quality of most studies involved in this systematic review, more studies with high quality should be conducted in individual and self-help CBT approaches to measure the impact of these approaches on more varied symptoms of menopause.

Conclusion

Finally, it can be concluded that although the indirect method is more cost-effective, it has less impact than the face-to-face method, and if there are possibilities, it is better to use face-to-face approaches to achieve a better result. However, in countries with fewer facilities, the self-help CBT (indirect methods) can be beneficial

Ethical Considerations: For this study, no approval was required from a medical ethics committee as no experiments were done on human beings.

Peer-review: Externally peer-reviewed.

Author Contributions

L.M, A.K were involved in the conception and design of the idea, data interpretation and preparation of manuscript. All authors (L.M, A k, N CH, B.A) participated in the statement and approved the final version of the manuscript

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- Appendix A:

Uncorrected Proof

Figure 1. PRISMA Flow Diagram.

Table 1: The classification of the climacteric symptoms improved by CBT.		
Vasomotor symptoms	Psychological symptoms	Organic disorder
Hot flash	Depression	myalgia
Night sweat	Anxiety	Urinary complaints
Vertigo	Insomnia(sleeping problems)	Vaginal dryness
Headache	Nervous	Joint and muscle pain
Palpitation	Melancholy	
Paresthesia	Fatigue	
Cardiac complaints	Irritability	
	Sexual problems	

Face-to-Face CBT methods

Table2- the efficiency of individual CBT on Climacteric symptoms

Author / year/ country	Study design	Sample size	Specifications of population	Comparison condition	scale	Intervention	Main findings				
Nowakowski 2017 Texas (33)	Clinical trial	N total: 40	mean age= 55 ± 6.2 reported ≥ 1 nocturnal hot flash	menopause education control (MEC) pre and post treatment	1.Insomnia Severity Index (ISI) 2. Center for Epidemiologic Studies Depression Scale (CES-D)	menopause education control (MEC) and cognitive behavioral therapy for menopausal insomnia (CBTMI)	SX*	Pre-treatment	Post-treatment	MD (%)	P value
						Insomnia Severity	CBTMI	15±3.5	4±3.7	-11 (73%↓)	=0.003
							MEC	16±4.2	10±5.0	-6 (37%↓)	
						Depression	CBTMI	16±9.0	8±7.4	-8 (50%↓)	=0.019
								MEC	15±11.1	13±9.2	
						4 sessions 50 minute over 8 weeks (Psycho- education					

						Cognitive Interventions)							
Khoshbooi 2012 Iran (32)	RCT	N total: 42 N intervention:20 N control:22	age range:41-55 with a depression score between 21 - 56	Control group Follow up periods	BDI-II Questionnaire	(I-CBT) 8 sessions 60 minute over 8 weeks skills group information based on cognitive behavioral assumptions	SX depression	Pre-test 32.30± 8.73	Post test 10.85± 6.17	4weeks 11.75± 6.59	MD (%) -20.55 (63%↓)	=0.001	
								34.09± 8.34	32.77± 6.92	33.77± 7.17	-0.32 (0.9%↓)		
Hunter 1996 South London (17)	RCT	N total: 61 N CBT: 27 N HRT:19 N control:15	age range 45-71 women who reported hot flashes (or night sweats) once a week or more frequently	CBT compare with hormone therapy (HRT) and no treatment control group (NT) Follow up periods	1.Women's Health Questionnaire 2.a checklist for assessment of hot flashes	4 sessions 60 minute over 6-8 weeks Relaxation, rhythmic breathing Cognitive-behavioural to	SX HF/NS frequency	Baseline 28.08± 21.06	Monitor 28.87± 25.41	Post-treatment 14.37± 16.47	Follow-up 11.41 ± 17.52	MD (%) -16.67 (59%↓)	<0.01
								42.92± 33.46	37.25 ± 35.43	11.75± 14.63	9.50 ± 14.06	-33.42 (77%↓)	<0.01
								24.19± 19.65	22.19± 18.14	23.19± 16.26	20.07 ± 17.87	-4.12 (17%↓)	>0.05

						cope with hot flushes	HF/NS problem rating	CBT	5.49 ± 2.58	5.28 ± 2.37	3.13 ± 1.77	3.65 ± 2.39	-1.84 (33%↓)	<0.01
								UPT	5.36 ± 1.98	5.33 ± 2.47	5.13 ± 1.39	5.23 ± 2.04	-0.13 (2.4%↓)	>0.05
								control	4.21 ± 1.83	3.32 ± 1.63	3.82 ± 1.71	3.82 ± 2.23	-0.39 (9.2%↓)	>0.05

*SX= the abbreviation of symptoms

Table 3-The efficiency of group CBT on menopausal symptoms

Table 3-The efficiency of group CBT on menopausal symptoms												
Author / year/ country	Study design	Sample size	Specifications of population	Comparison condition	scale	intervention	Main findings					
Soori 2018 Iran (21)	RCT	N Total:76 N intervention:38 N control:38	rage age:47 -57 rage of time passed from menopause: 1 to 4 years	Control group Pre and post treatment	The Depression, Anxiety, and Stress Scale (DASS-21)	6 sessions 60 to 90 minutes Groups of 11 to 12 women	Sx*	Pre- treatment	Post treatment	1 month later	MD (%)	P value
							9.63± 3.72	2.63 ±1.97	2.35 ±1.66	-7.01 (72%↓)	< 0.001.	
						Depression	8.50 ±3.42	7.81 ±3.97	7.44 ±2.66	-1.06 (12%↓)	> 0.05	
Larroy 2015 Spain	quasi- experim ental	N total:53 N intervention:28 N control:25	Age range:42 to 55	Control group	1.Blat’s Kupperman Menopausal Index (BKMI)	8 sessions 120 minutes weekly	SX	Pre- test		Post test	MD (%)	P value
							Hot	8.29± 3.91		4.29± 3.76	-4 (48%↓)	<0.001

(23)				Pre and post treatment	2. Hospital Anxiety and Depression Scale (HADS)	Groups of 8 -10 women Psycho education, relaxation , exercise and nutrition, Kegel exercises. sexual re-education, problem-solving,		U	10.4± 2.58	10.8± 2.86	0.40 (3.8%↑)	> 0.05
							Nervous	+	4.46± 1.64	3.64± 2.04	-0.82 (18%↓)	<.0.05
								U	3.40± 1.91	3.60± 2.00	0.20 (5.8%↑)	> 0.05
							Melancholia	+	2.14± 0.93	1.25± 0.84	-0.89 (41%↓)	<0.001
								U	1.68± 1.18	1.60± 1.19	0.80 (47%↑)	> 0.05
							Anxiety	+	11.79± 3.05	8.14± 3.19	-3.58 (30%↓)	<0.001
								U	10.60± 1.98	10.28± 1.43	-0.32 (3%↓)	> 0.05
							Depression	+	6.71± 3.71	4.79± 2.63	-1.92 (28%↓)	<0.001
								U	4.65± 3.69	4.88± 3.39	0.23 (4.9%↑)	> 0.05
							Intensit	+	28.75± 5.75	19.36± 8.62	-9.39	<0.001

											(32%↓)		
									28.88± 6.63	28.48± 5.97	-0.40 (1.3%↓)	> 0.05	
Norton 2014 South London (20)	RCT	N total:93 N intervention:48 N control:45	Mean age:53.09±5.4	control group follow up periods	HFNS problem rating (HFRS)	4 session Weekly 160 minutes Groups of 6-8 women received a relaxation/paced breathing CD	SX	baseline	6 weeks	26 weeks	MD (%)	P value	
			18 years or older				HF/NS problem rating	5.87± 2.28	3.75± 0.76	4.54± 0.8	-1.33 (22%↓)	=0.001	
			having problematic hot flashes and night sweats (HFNS)				HF/NS frequency	5.87± 2.28	Not significant difference	Not significant difference			
							HF/NS frequency	63.15± 49.24	60.67± 1.61 Small significant reduction		-2.48 (3.9%↓)	<0.05	
							HF/NS frequency	63.15± 49.24	Not significant difference	Not significant difference			
Green 2013 Canada (34)	a pilot study	N total: 8	Age range: 40– 60	Pre and post treatment	1.The Hot Flash related Daily Interference Scale HFRDIS;	10 session Weekly 160 minutes Groups of 4 women	SX	Pre-treatment		Post treatment		MD (%)	P value
							Hot Flash Daily Interference	39.8 ±12.4		16.9±9.5		-22.90 (57%↓)	=0.01
							Anxiety	19.8 ±6.0		12.8 ±6.7		-7 (35%↓)	=0.00

					2.The Greene Climacteric Scale GCS	Psychoeducation, Cognitive restructuring,, relaxation , Behavioral modification for urogenital complaints	Depression	6.9 ±3.6		4.6±4.1		-2.3 (33%↓)	=0.04
					3.The Montgomery–Asberg Depression Rating Scale MADRS;		variety of menopausal		23.1 ±10.7		19.0 ±13.7		-4.1 (17%↓)
					4.The Hamilton Anxiety Scale								
Ayers 2012 London (19)	RCT	N total:93 N intervention:48 N control: 45	average age: 53.09 years women having 10 or more problematic hot flaflashshes and night sweats (HF/NS) a week for at least a month	control group follow up period	subscale of the HFRS	4 session	SX	Baseline		6wks	26wks	MD (%)	P value
						Weekly 160 minutes Groups of 4 women	HF/NS problem rating	6.00± 2.15		3.01± 2.11	2.86±2.11	-3.14 (52%↓)	=0.001
								5.79± 2.76		4.97± 2.44	4.18± 2.45	-1.61 (27%↓)	
						Using PowerPoint presentations, a relaxation/paced breathing CD, and handouts.	HF/NS frequency	61.83± 38.17		43.85± 42.16	36.77± 50.71	-25.06 (40%↓)	=0.004
								56.69± 50.43		49.67± 48.55	44.05± 45.18	-12.64 (22%↓)	

Khoshbooi i 2012/2011 Iran (31, 32)	RCT	N total:44 N intervention:22 N control:22	aged range: 41-55 with a depression score between 21 and 56	Control group Pre and post treatment + follow up	BDI-II Questionnaire	16 sessions	SX	Pre-test	Post test	4wks	MD (%)	P value	
						twice weekly	depression	33.95± 9.64	12.04± 5.89	12.63± 6.41	-21.32 (62%↓)	=0.001	
						160 minutes		Psycho-education Cognitive Interventions Behavioral Intervention	34.09± 8.34	32.77± 6.92	33.77± 7.17		-1.13 (3.3%↓)
Larroy 2011 Spain (4)	A pilot study	N total:49 N intervention: 21 N control:28	Range age:43 - 56	Control group Pre and post treatment	1.Hospital Anxiety and Depression Scale – HADS- 2.Kupperman and Blatt Menopausal Index	8 sessions	SX	Pre-treatment		Post treatment		MD (%)	P value
						weekly	Anxiety	6.43± 4.3		5.24± 3.40		-1.19 (18%↓)	< 0.010
								10.60± 1.98		10.28± 1.43		-0.32 (3%↓)	> 0.05
						160 minutes	Depression	4.05± 3.19		2.76± 2.98		-1.29 (31%↓)	<0.025
								4.72± 3.69		4.88± 3.39		0.16 (3.3%↑)	>0.05
						psycho education, relaxation, Kegel exercises, and problem-solving techniques	Inten	14.14± 7.03		11.24± 6.47		-2.9	<0.030

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2006					Rating Scale MRS	weekly 90 minutes		10 weeks before	before beginning	after last session		
Switzerland (35)					2.The Hospital Anxiety and Depression Scale (German version)	Groups of 4–8 women	Hot flashes	4.3± 2.2	3.4± 2.0	2.6± 1.7	-1.7 (39%↓)	<0.01
						Relaxation techniques, breathing, , Exercise for coping with sexual problem	Cardiac complaints	1.4± 1.7	1.7± 2.1	0.8± 0.6	-0.6 (42%↓)	<0.01
						one follow-up group session 3 months after the intervention	Sleeping problems	3.1± 2.5	3.3± 1.9	3.7± 4.8	0.6 (19%↑)	N.S**
							Depressive mood	3.6± 2.5	3.8± 2.8	2.6± 2.2	-1 (27%↓)	<0.02
							Irritability	3.4± 2.2	4.1± 2.5	3.2± 2.4	-0.2 (5.8%↓)	N.S
							Reduced effectiveness	3.8± 2.3	4.2± 2.7	3.2± 2.3	-0.6 (15%↓)	<0.04
							Sexual problems	4.8± 3.1	4.3± 3.2	3.4± 2.7	-1.4 (29%↓)	0.06
							Urinary complaints	1.0± 1.3	1.4± 1.4	1.1± 1.2	0.1 (10%↑)	N.S
							Vaginal dryness	4.1± 3.5	4.0± 3.0	2.9± 2.5	-1.2 (29%↓)	<0.03

								Joint and muscle pain	3.1± 2.6	2.7± 2.1	2.6± 2.0	-0.5 (16%↓)	N.S	
								Anxiety	7.7± 4.5	8.2± 4.8	6.2± 4.2	-1.5 (19%↓)	<0.01	
								Depression	5.8± 4.4	6.7± 5.4	4.7± 3.9	-1.1 (18%↓)	<0.02	
Keefer 2005 New York (14)	Pilot study	N total: 19 N Immediate: 11 N Delayed: 8	mean age = 51.0± 4.7	follow up periods	1.The Women’s Health Questionnaire 2.daily vasomotor symptom diary	Participants were randomized into either immediate treatment or delayed treatment Immediate group treatment 8 sessions weekly 90 minutes Groups of 4–6 women. psychoeducation, cognitive restructuring and	SX	Pre-treatment		Post treatment		MD (%)	P value	
							Hot Flashes	immediate	65.63± 71.06		37.81± 58.44		-27.82 (42%↓)	=0.21
								delayed	66.54± 60.63		58.75± 95.13		-7.79 (11%↓)	
							Night Sweats	immediate	11.73± 8.76		6.91± 8.25		-4.82 (41%↓)	=0.09
								delayed	32.89± 23.47		68.00± 88.12		35.11 (>100%↑)	
							Distress Rating	immediate	3.78± 2.22		2.59± 2.71		-1.19 (31%↓)	=0.06
								delayed	4.86± 1.48		5.15± 1.60		0.29 (6.3%↑)	

						paced respiration education,	Problem Rating	immediate	4.42± 1.97	2.72± 2.79	-1.7 (38%↓)	=0.18
							delayed	9.17± 12.97	3.83± 1.78	-5.34 (58%↓)		
							Total Vasomotor	immediate	78.27± 44.73	44.73± 62.43	-33.54 (42%↓)	=0.01
							delayed	98.50± 64.98	126.75± 121.85	28.25 (28%↑)		
*SX= the abbreviation of symptoms												
**N.S= Not Significant												

Indirect CBT methods

Table 4 :The efficiency of self-help CBT on menopausal symptoms

Author / year/ country	Study design	Sample size	Specifications of population	Comparison condition	scale	intervention	Improvement score						
Hardy 2018 United Kingdom (36)	multicenter randomized controlled trial	N total: 124 N intervention :60 N control:64	Range age: 45-60 Working women having problematic HF/NS for at least 2 months	Control group follow-up period	Hot Flash Rating Scale as used in the MENOS2 trial	self-help cognitive behavior therapy The final SH-CBT intervention was an A5 sized, color booklet with instructions and four chapters (with information, exercises and homework tasks) to be completed over 4 weeks.	SX*		baseline	6 weeks	20 weeks	MD (%)	P value
							HF/NS problem rating	—	6.25± 1.97	4.38± 2.21	4.36± 2.29	-1.89 (30%↓)	6w: P<0.00 1
								C	6.80± 1.90	6.16± 2.31	5.80± 2.30	-1 (14%↓)	20w: P=0.01
							HF/NS frequency	—	53.13± 34.34	40.59± 26.03	34.28± 27.62	-18.85 (35%↓)	6w: P=0.01 20w: P=0.05
								C	54.28± 38.11	54.02± 43.00	46.03± 37.92	-8.25 (15%↓)	

McCurry 2016 western Washington State (37)	A single-site, randomized clinical trial	N total: 106 N CBT: 53 N MEC: 53	Range age:40 -65 with moderate insomnia symptoms ([ISI] score, ≥12) and 2 or more daily hot flashes.	Menopause education control (MEC) follow-up periods	Insomnia Severity Index [ISI] score	Telephone-Based Cognitive Behavioral Therapy Six CBT-I or MEC telephone sessions in 8 weeks behavioral sleep plan Stimulus control instructions, behavioral sleep plan,	SX	baseline	8weeks	24weeks	MD (%)	P value
							Insomnia CBT-I	15.6± 0.8	5.7± 1.3	4.9± 1.2	-10.7 (71%↓)	< .001
							MEC	16.8± 1	12.1± 1.4	9.4± 1.7	-7.4 (46%↓)	< .001
							CBT-I	-	baseline – 15.7± 4.7	baseline – 22.8± 5.9	-22.8	= 0.03
							MEC	-	baseline – 7.1± 7.5	baseline – 11.6± 7.8	-11.6	= 0.003
	RCT	N total:92	Range age: 44–77	control group			SX	baseline	6 weeks	3 month	MD (%)	P value

Stefanopoulou 2014 London (38)		N intervention : 47 N control: 45	age from 18 years or older with problematic hot flashes and night sweats (HF/NS score > 2) for at least 1 month and minimum frequency of 10 flashes per week	follow-up periods	The Hot Flash Rating Scale (HFRS)	Telephone-guided Self-Help Cognitive Behavioral Therapy Women completed a Self-Help CBT intervention (booklet and relaxation/paced breathing CD) during a 4-week period. women also received one 'guiding' telephone call from a clinical psychologist two weeks into treatment	HF/NS frequency	-	55.52± 38.34	37.85± 30.33	28.54± 27.55	-26.98 (48%↓)	= 0.001
							U	56.69± 50.43	49.67± 48.55	44.05± 45.18	-12.64 (22%↓)		
							HF/NS problem rating	-	6.23± 2.16	3.74± 1.87	2.98± 1.36	-3.25 (52%↓)	< 0.0001
								U	5.79± 2.76	4.97± 2.44	4.18± 2.45	-1.54 (26%↓)	
Norton 2014 South London (20)	RCT	N total: 92 N intervention :47 N control: 45	Mean age:53.09±5.4 18 years or older having problematic HFNS (score >2)	control group follow-up periods	HFNS problem rating (HFRS)	self-help cognitive behavior therapy the material in booklet form; and received a relaxation/paced breathing CD during a 4-week period.	SX	baseline	6weeks	26weeks	MD (%)	P value	
							HF/NS problem rating	-	5.87± 2.28	3.79± 0.58	4.68± 0.83	--1.19 (20%↓)	6w: P< 0.001
								U	5.87± 2.28	-	-		26w: P= 0.001
							HF/NS	-	63.15± 49.24	60.67± 0.21 Small significant reduction	-2.48 (3.9%↓)	Small significa nt	

								63.15± 49.24	-	-			
Ayers 2012 London (19)	RCT	N total:92 N intervention : 47 N control: 45	average age: 53.09 years women having 10 or more problematic hot flashes and night sweats a week for at least a month	control group follow-up periods	subscale of the HFRS	self-help cognitive behavior therapy Self-help CBT includes a self-help book completed during a 4-week period and two contacts with a clinical psychologist (one introductory session and a guiding telephone call 2 week into treatment)	SX	Baseline	6weeks	26weeks	MD (%)	P value	
							HF/NS problem rating	5.84± 1.93	2.96± 1.76	3.07± 1.93	-2.77 (47%↓)	6w: p< 0.001	
								5.79± 2.76	4.97± 2.44	4.18± 2.45	-1.61 (27%↓)	26w: P= 0.005	
								HF/NS frequency	70.68± 57.49	49.20± 39.24	44.94± 42.70	-25.74 (36%↓)	6w: P=0.66 8
									56.69± 50.43	49.67± 48.55	44.05± 45.18	-12.64 (22%↓)	26w: P < 0.05

*SX= the abbreviation of symptoms

Table 5: Quality of studies								
study	random sequence generation	allocation concealment	blinding of participants and personnel	description of drop-outs	power analysis (N>50)	intention-to-treat analysis or no drop-outs	Total score	Quality rating
Soori/2018/Iran (20)	0	1	1	1	1	1	5	high
Hardy/2018/ United Kingdom (33)	0	1	1	1	1	0	4	moderate
Nowakowski/ 2017/Texas(30)	0	1	0	0	0	0	1	low
McCurry/2016/ Western Washington State (34)	0	1	1	1	1	0	4	moderate
Larroy/2015/ Spain (21)	0	0	0	0	1	0	1	low
Norton/2014/ South London (19)	0	1	0	0	1	0	2	low
Stefanopoulou/ 2014/London (35)	0	1	0	1	0	0	2	low

Green/2013/ Canada (31)	0	0	0	1	0	1	2	low
Ayers/2012/ London (18)	0	1	1	1	1	0	4	moderate
Khoshbooi/ 2012/ Iran (29)	0	1	0	1	1	0	3	moderate
Khoshbooi/ 2011/ Iran (28)	0	1	0	1	1	0	3	moderate
Larroy/ 2011/ Spain (4)	0	0	0	1	0	0	1	low
Alder/ 2006/ Switzerland (32)	0	0	0	0	0	1	1	low
Keefer/ 2005/ New York (13)	0	1	0	1	0	0	2	low
Hunter/ 1996/ South London (1616)	0	0	1	0	1	1	3	moderate