

Massage Therapy for Alleviating Menopausal Transitional Period Symptoms among Women employed at Suez Canal University Hospital

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Abstract

Background: Massage therapy is an old independent nursing intervention. It has effect on endocrine and circulatory systems and can regulate hormonal production, improve physiological functions, and promote muscle relaxation. Many menopausal transitional symptoms expected to benefit from massage sessions. **Aim of the study:** was to investigate the effect of massage therapy on reducing menopausal transitional period symptoms among women at Suez Canal University. **Subjects and methods:** The study conducted on females employed at Suez Canal University Hospital in Ismailia city. **Design:** Quasi-experimental design was adopted. **Sampling:** Purposive sample of 74 healthy women during their menopausal transitional period and didn't use hormonal replacement therapy. **Tools of data collection:** A structured interviewing questionnaire was used to ask about symptoms of menopausal transitional period (pre and post intervention). **Procedure:** Women met the criteria of selection were randomly assigned to interventional or control group. Interventional group received 30 min massage treatment session two times per week for 8 weeks (16 sessions in total). Evaluations were done after 8th, 16th sessions, and after 2 weeks of intervention. **Results:** Women in massage therapy group had significant improvement in many menopausal transitional period symptoms as decreasing in the frequency of hot flushes attacks and night sweats, decrease of menstrual pain, decrease at all urinary symptoms and dyspareunia. Highly significant improvement was observed in the psychological symptoms. **Conclusion and recommendations:** Massage therapy was effective in reducing many menopausal transitional period symptoms. So, it is important to incorporate massage therapy into nurses' daily practice with ensuring institutional support needed.

Keywords: Menopausal transitional period symptoms, massage therapy

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I. Introduction

Menopausal transition defined as the time period from the beginning of menstrual cycle irregularity to reach the final menstrual period (FMP) (Gjelsvik., 2013). This period includes physiologic changes as women approach reproductive senescence. Evidence supports the clinical importance of this period for many women as a period of temporal changes in their health and quality of life. (Harlow & Paramsothy, 2011).

Menopausal transition is divided to early and late transition; early transition defined by a persistent difference in consecutive menstrual cycle length of seven days or more, begins on average 6-8 years before the FMP. Late transition, defined as an episode of 60 or more days of amenorrhea, begins on average 2 years before the FMP (Harlow and Paramsothy., 2011). Perimenopause includes menopausal transition and one year after final menstrual period. This last year is called very late perimenopause (Prior and Hitchcock., 2011).

During this period, ovarian activity declines (estrogenic activity is reduced), leads to different signs & symptoms. Often, the first sign is menstrual irregularity. Vasomotor symptoms include hot flashes, palpitation, fatigue and weakness (Cook., 2016). They tend to occur at night, interrupting sleep patterns causing insomnia. Other important physical changes are vaginal dryness, headache, irritability, mood swings & nervousness, difficulty concentrating, depression, memory loss and breast tenderness. (Paudyal and Nepal., 2014; O'Malley, 2015).

Varieties of alternative methods have been used for managing menopausal transitional period symptoms such as aromatherapy massage or massage only (Pacholyk, 2015). As in nursing's early days, massage therapy is still promoted in today's nursing textbooks as a way to manage pain, increase comfort, and preserve function of major body systems. But, throughout the 20th century, massage was less practiced and lost ground with the increased reliance on analgesics, increased monitoring and documentation demands on nurses' time and increased technologically based protocols. (Ruffin, 2011)

Massage may be the oldest and simplest form of care. Since Florence Nightingale, nurses have been trained in massage therapy and have routinely administered massages to patients. In 1882, the “American Florence Nightingale,” began instructing nursing students in the art of massage, ultimately prompting the head nurses at the hospital to request a course at their own expense. Several early nursing texts described massage as a basic nursing skill, and writings from the 1920s indicate that massage was at that time still firmly embedded in the nursing process and seen as an essential part of patient care plans. (Ruffin, 2011). In Eastern cultures, massage has been practiced continually since ancient times. Egyptian tomb paintings show people being massaged. (Borysenko, 2014; Skogar and Lakk 2016).

Massage is the scientific manipulation of soft tissue of the body, as a part from mere rubbing. These manipulations are effective for the purpose of producing effects on the muscular, nervous, and respiratory system also, on the local and general circulation of the blood and lymph. Massage can be seen as a means of inducing relaxation and promoting the body systems to heal and improve their functioning (Borysenko, 2014).

Human body responses to massage through mechanical responses and reflexive responses. Examples of mechanical response are increasing blood circulation, reducing swelling and breaking up of scar tissue. The reflex effect of massage is more prominent than its mechanical action such as general relaxation and decrease blood pressure (Justin, 2012). The sensory receptors situated in the skin, gets stimulated as the skin is touched, pressed, or rubbed. The afferent (sensory) neuron transmits information from the tissues and organs of the body to the central nervous system which release endorphin, enkephalin and other pain reducing neuro-chemicals. In addition, it stimulates parasympathetic nervous system and promotes relaxation, decrease insomnia, improve sleeping pattern, increase alertness and ability to concentrate, as well as less anxiety, and decrease stress related hormone such as nor epinephrine and cortisol. (Beth and Simonso, 2008; Charles, 2014).

Massage therapy can be helpful for women as they go through menopause. It can stimulate the pituitary, adrenal, thyroid, and parathyroid glands, which help balance production of hormone and lower the number of hot flashes. This version of body work can help balance the body's systems. Long-term outcomes can include stronger immunity and health, less chronic muscle tension, less chronic pain, and a more positive body image, (Charles, 2014).

Studies suggested that fat cells as well as endocrine glands which producing hormones can profoundly affect on human health (Kathleen, 2013). In fatty areas of the body as in abdominal area, thighs, and gluteal muscles estrogen hormone are manufactured and stored. Mobilize fatty globules or deposits (adipose tissues) by the application of massage spreading over a larger area can melt or breakdown of adipose tissues (by the heat produced from increased blood circulation during the massage) and aiding its absorption by the lymphatic system. (Rath et al., 2008). Fat breakdown is associated with infusing of estrogen hormone; some studies examined the effect of exercise or other signals the body receives on fat breakdown and infusing the hormones. They suggested that estrogen resulting from fat breakdown can help premenopausal women overcome their symptoms (Kathleen, 2013).

Classic massage “Swedish massage” is a mechanical manipulation of body tissues with rhythmical pressure including various combinations of stroking, rubbing, kneading, and vibration. It incorporates different types of strokes. Strokes vary in both pressure and direction. It is including stripping-short strokes which performed in the same direction as the muscle fibers, friction-circular or short strokes which performed with back-and-forth movements across the muscle, effleurage—which is light, long, skimming, often circular and applied with the palm of the hand, and wringing which is a working of the muscle between both hands in a motion that mimics wringing out a towel (Mostafa et al., 2015).

Massage is an independent nursing intervention that is widely accepted and associated with very minimal risk. During performing massage nurses can use some type of lotion to which the patient has no allergy or aversion. Nurses should frequently ask about feedback on stroke style, pressure, depth, and paying close attention to the patient's body language. Before administering a massage, quiet the environment and eliminate distractions as possible during the massage (Westman, 2016). Precautions to don't perform massage include some conditions such as contagious diseases including any cold or flu, fever, women with recent operations or acute injuries, skin diseases, varicose veins, bruising, neuritis, sunburn, cuts, abrasions, undiagnosed pain and inflammation, including arthritis. Contraindications for massage therapy include cardio-vascular conditions, phlebitis thrombosis, hypertension, edema, high blood pressure, those with pacemakers, and cancer. (Sharpe et al., 2007; Bivd, 2014)

Nurses play an important role in initially identifying women with troublesome symptoms (Speedl et al., 2014). Nurse assesses women in order to formulate nursing diagnoses about symptoms and problems of the menopausal transition period, plans nursing care through better understands of woman options to develop a personal plan tailored to her individual needs, then implements a plan of care and provide education directed to ways of managing symptoms and or problem to keep and restore function. And then, evaluates the nursing care that is being provided and modifies the plan as needed (Bevans and Sternberg, 2012; Association of rehabilitation nurses, 2015; Warren, 2016).

Significance of the study:

Symptoms of menopausal transition period are very common problems among women. They experience a number of physical, emotional and social symptoms which affect on daily living. Prevalence of these symptoms differs from woman to another. (Borgelt et al., 2010).Abedzadeh, (2015) reported that the prevalence of common symptoms were 68.5% hot flashes & sweating, 37.3% vaginal dryness and 30.7% sexual problems. As regarding the severity of the symptoms, the most severe symptoms were hot flashes and excessive sweating. There are 66% of the women in this period were at a definite risk of illness and 34% were at a moderate risk of illness. Many disorders during menopausal transition had significantly greater stressful life events. (Mohamed et al., (2015).

Egyptian women do not prefer to use medication for menopausal transitional symptoms as they believe that it may cause some side effect and some complications. Alternative and complementary therapies are increasingly popular among women who seeking alternatives to pharmacological treatment for managing menopausal transitional symptoms (Gamus 2017). Because of the role of nurses in providing menopausal care is probably under-utilized (Warren, 2016), so this study aimed to evaluate the effect of massage therapy on reducing the symptoms of menopausal transitional period as a method can be used by nurses.

Aim of the study:

This study aims to investigate the effect of massage therapy on alleviating menopausal transitional period symptoms among women at Suez Canal University Hospital.

Research hypothesis:

Abdominal and back massages alleviate menopausal transitional period symptoms among employed women at Suez Canal University Hospital.

Subjects and Methods

(1) Technical design

The technical design involves the research design, setting, target population, sampling design and tools of data collection.

Research design

Quasi-experimental design was adopted in this study to investigate the effect of abdominal and back massage on alleviating symptoms of menopausal transitional period among women in Suez Canal University Hospital.

Study Setting

The study conducted at Suez Canal University Hospital in Ismailia city.

Target population

Target population of this study was healthy women during menopausal transitional period.

Study Sample

Sample size

The sample size was calculated according to the following equation:

$$n = \frac{k \times 2\sigma^2}{(MD)^2} :$$

N Sample size

K Digital number of groups

Σ is the standard deviation

MD The difference in effect of two groups. (Haeng, 2008)

So, according to the calculations the sample size was 37 women within each group (massage group and control group).

Sample:

Purposive sample of 74 women during menopausal transitional period were recruited in the study according to inclusion and exclusion criteria. Suitable women were listed and from the prepared list the women randomly assigned into study group (where abdominal and back massage performed) or control group (without any intervention).

Inclusion criteria: Women entered in menopausal transitional period naturally, aged from 45 to 55 years, and had been complaining of at least 2 menopausal transitional period symptoms.

Exclusion criteria: Women had any chronic or acute diseases, had been using hormonal replacement therapy or any kind of treatments for at least six months

Tool of Data Collection

Based on the relevant literature the researcher prepared the following tool of data collection:

A structured interviewing questionnaire: It consisted of three parts: the first included personal data as age, education, occupational, and marital status, and included also obstetrical history as number of pregnancies, labors, abortions, living children, and family planning methods used. The second part included menstrual history as cycle interval, pain during menstruation. The third part asked about symptoms of menopausal transitional period (pre and post intervention) as vasomotor symptoms, urinary symptoms, vaginal symptoms and psychological symptoms.

Tool validity:

The tool was revised by five expertises for clarity, relevance, applicability, comprehensiveness, understanding and easiness for implementation. According to their suggestions, the modifications were applied before data collection.

Pilot study:

A pilot study was carried out on 10% of the study sample to test the validity of the tool and feasibility of the study, and necessary modifications were done according to the results of pilot study. Women involved in pilot study were excluded from the study sample.

(2) Administrative design and ethical considerations:

Official letters presented to the manager of Suez Canal University Hospital to gain formal approval to conduct the study.

Ethical considerations:

Informed consent was obtained from the women after they were informed about the nature, process, and expected outcomes of the study. Women were reassured that the study is safe and the information obtained only for the purpose of the study, also they informed about her rights to withdraw at any time she want throughout the study.

(3) Operational design

- Preparatory phase:

Preparation of lists of study groups:

From the study settings, the researcher selected 74 women which met the selection criteria and accepted to participate in the study. The researcher wrote each women name in piece of paper. All paper pieces were put in a bottle and by simple random method women were assigned to the study group or control group (37 women in abdominal and back massage group, and 37 women in control group). Finally, lists of study and control groups were written.

Procedure

Data collected through period of 7 months from begging of January 2016 to the end of July 2016. The researcher was available daily in study setting to assess and manage women under study. The researcher introduced herself to all women then explained the purpose of the study in order to obtain their cooperation.

• **Interviewing phase**

Firstly, the researchers interviewed each woman individually and filled the questionnaire. All data needed about women's personal characteristics, menstrual, obstetrical, family planning history and their menopause transitional symptoms were collected. The interview consumed about 25 minutes for each women.

• **Interventional phase:**

1- Study group (Massage group):

By the researcher each woman in this group received massage therapy. Massage sessions performed at a privet room in the hospital to ensure women privacy. The treatment involved an abdominal and back massage. They were received 30 min massage treatment session two times per week for 8 weeks (16 sessions in total).

2- Control group (no intervention group)

Women in this group didn't receive any intervention. They assessed regarding menopause transitional symptoms at the beginning of the study and reassessed after the study.

- **The study intervention (massage therapy):**

Technique of Abdominal Massage

Women were instructed to assume supine position and a cushion was placed under the women's knees to keep the abdomen relaxed. Then the researchers applied gently effleurage massage. The effleurage massage is done with the palm of the hand or fingers with rhythmic and gentle rubbing movements start at lower abdomen in the form of circular stroking movements toward right and left. The strokes were slow, smooth and continuous and intensity of the given pressure was 4 with a scale of 0–10, where 0 is no pressure and 10 is crushing pressure..(Lotfipur-Rafsanjani et al., 2015).

Technique of Back massage:

This technique was used by whole hand "effleurage", Use the whole surface of both hands. Massage reasonably firmly upwards from the lower back all the way up to the neck, then gentler pressure, circle around and back to the lower back region (5 to 10 minutes) (Buyukyitmaz and Asti 2013).

- **Evaluation phase and follow up:**

The researchers reassessed the massage and control group for menopause transitional symptoms. The evaluation performed after 8 sessions and after 16 sessions of intervention. Follow up done after other 2 weeks to assess presence of the symptoms.

(4) Statistical Design

The collected data were organized, tabulated and analyzed using statistical package of social science (SPSS) 17.0 programs. The data was presented in numbers and percentages. Mean and standard deviation were calculated for quantitative data. Chi-square (X^2) test was used for qualitative data. T test and one way ANOVA test were used for quantitative data. P value equal or less than 0.05 considered significant value.

II. Results

The highest frequency of women under study was married (78.4% in massage group and 54.1% in control group), from urban residence, their mean age was 49.05 ± 3.98 for massage group and 49.94 ± 3.65 for control group. Secondary level of education presented in 48.6% of massage group and high level of education presented 40.5% of control group and semi-professional occupations were the work of the majority of women. There were no statistical significance differences between the studied groups regarding menstrual data. The mean of the menstrual interval was 26.51 ± 8.91 for massage group and 28.27 ± 12.18 for control group. Also, no statistical significance differences were observed between the studied groups regarding obstetrical history, and using of contraceptive methods. Normal delivery was 79.4% in massage group and 85.29% in control.

Table (1) presents comparison between study and control group regarding to their vasomotor symptoms during and after intervention. As shown, there was significant decrease in the frequency of hot flushes attacks and night sweats among women in the study group where percentage of women had 3-9 attacks per day decreased from 27% before intervention to 16.2% after 8 and 16 sessions then decreased to 10.8% after 2 weeks follow up. Concerning night sweat, percentage of women hadn't night sweats increased from 8.1% before intervention to 13.5% after 8th session, then 45.9% after 16th session then 51.4% at 2 weeks after study. Also, significant differences were observed when comparing study and control groups regarding night sweats. On the other hand, intensity and length of hot flushes attacks decreased slightly among study group without statistical significant differences but, there was a significant differences when compared study group with control group after 8 sessions regarding intensity and length of hot flushes attacks.

Table (2) indicates significant improvement at all urinary symptoms in the study group through the study. As shown, in the study group 75.7% of women hadn't stress incontinence at 2 weeks follow up compared to 10.8% of women before the study and 83.8% of women hadn't urge incontinence at 2 weeks follow up compared to 13.5% before study. Comparing study with control group shows significant differences only at 2 weeks follow up for stress and urge incontinence and after 16th session for dysuria.

Table (3) shows significant improvement in the symptom of dyspareunia in the study group, where only 5.4% of women had dyspareunia at 2 weeks follow up compared to 48.6% before the study. Significant differences were also observed when comparing study and control groups regarding dyspareunia through the study. On the other hand, no significant change was observed regarding abnormal vaginal discharge in the studied groups.

Table (4) shows that menstrual interval didn't affected by intervention at all, but pain during menstruation was significantly improved for the study group ($p = 0.001$). Comparing to control group, there were significant decrease in level of pain for study group after 8th, 16th, and 2 weeks follow up.

Table (5) presents psychological symptoms changes in the studied groups and compare between them. Results indicate that there were statistical significant improvements among women in the study group during and after intervention regarding symptoms of irritability and depression. Comparing to control group significant

differences in the level of irritability were observed after 16th session and at 2 weeks of follow up. Concerning symptom of depression, significant differences between studied groups observed after 8th session, 16th, and at 2 weeks of follow up.

III. Discussion

The current study found significant improvement in some menopausal transitional period symptom. There was significant decrease in the frequency of hot flushes attacks and night sweats among women in the massage group. Intensity and length of hot flushes attacks decreased slightly among study group without statistical significant differences. Also, significant improvements were observed in symptom of dyspareunia and all urinary symptoms (stress and urge incontinence and dysuria) in the massage group through the study.

Darsarehet et al., (2012) conducted a randomized placebo-controlled clinical trial at a menopausal clinic in Tehran. The study aimed to evaluate the effect of massage and aromatherapy massage in reducing menopausal symptoms, as obtained through the Menopause Rating Scale. The study sample comprised 90 women who were assigned to an aromatherapy massage group, a massage only group, or a control group. Each Participant in the aromatherapy massage group and massage only group received 30 minute treatment sessions twice a week for 4 weeks. Participants in aromatherapy massage group were massaged with aroma oil, whereas participants in the massage only group were massaged with plain oil. No treatment was provided to control group participants. The study concluded that both massage and aromatherapy massage were effective in reducing menopausal symptoms.

In the same line, a study conducted to evaluate the effect of therapeutic massage on climacteric symptoms and insomnia in postmenopausal women. Their results revealed that, therapeutic massage group had improvement in subjective data related to climacteric symptoms according to Menopause Quality of Life questionnaire. (**Oliveira et al., 2012**). Also, study conducted by **Hutton et al., (2015)** who compare among physical interventions, behavioral interventions, natural health products, and pharmacologicals to manage hot flushes. They found that physical therapies as massage has increased and they recommended it for those women who need relief from their hot flushes.

Improvement of menopausal transitional period symptoms as hot flushes, urge incontinence, and dyspareunia among women in massage therapy group can be explained by releasing and absorption of estrogen resulting from breakdown of adipose tissues. Breakdown of adipose tissues occur as a result of effect of heat produced from increased blood circulation during the massage over a larger fatty areas. So, women reported improvement in their symptoms. (**Rath et al., 2008; Kathleen, 2013**).

In the same line, **Kassolik et al., (2013)** conducted study to determine the effectiveness of massage therapy in the management of stress urinary incontinence. The study included 50 years old women with stress incontinence and treated with massage therapy. The procedure included keeping women in supine position with maintaining abdominal muscle relax. Massage therapy start with superficial stroking toward the armpits then pubis, deep stroking with a brush, stroking of the pyramidal muscle, dubbing of the pyramidal muscle, kneading of the straight abdominal muscle and finally kneading of the oblique muscle of the abdomen. The massage session lasted for 20 minutes and repeated twice a week. The therapy was continued for 4 weeks. The results of this study showed that applying massage therapy contributed to immediately decreased amount of urine leakage following the massage therapy by 21%, and after one month later a complete remission of symptoms were observed by 100% and improved the quality of patient's life.

The effect of massage therapy on the improvement of stress incontinence can be explained by positive effect of massage on the improvement of the function of the bladder. The activity of the bladder can be affected indirectly thanks to its specific construction. Massage of the abdominal muscles and urinary bladder contributes to normalization of venous blood distribution in the region. Muscles cells undergo regeneration due to dilatation of the blood vessels and congestion in the involved region. This mechanism increases muscles elasticity, improves their firmness and improves their contractility. For this reason, elaboration of the region can affect the function of bladder sphincter muscles (**Herderschee et al., 2011**)

Among menstrual characteristics of the studied women, only level of pain was significantly reduced for the massage group comparing to control group. Many studies conducted to evaluate the effect of massage with or without aromatic oils on relieving of menstrual pain. Result of **Lai, et al., (2012) and Aval, et al., (2014)** agreed with the study result. They studied menstrual pain relieving by using abdominal massage with aromatic essential oils or abdominal massage only without aromatic oils. They found significant improvement in menstrual pain for the two groups.

Abdominal massage helps in decreasing menstrual pain when trying to detoxify the body by increases blood flow within the abdominal area to increase oxygen to the organs and relaxes muscles tension. Touch therapy aspect of abdominal massage provides soothing heat and comfort in females; it aligns the uterus to their proper positions and releases emotional tension (**Rebecca, 2014**).

Results of this study indicate that there were statistical significant improvements among women in the study group during and after intervention and when comparing to control group regarding symptoms of irritability and depression. Many studies concerned to study the psychological problems during menopausal

transition or postmenopause periods and evaluate the effect of non-pharmacological measures including massage therapy. Gamus (2017) conducted a study to review the evidence on non-pharmacologic, non-herbal management treatments of integrative and complementary medicine in climacteric disorders. His finding indicated some evidence that massage, acupuncture, and yoga can alleviate symptoms of depression.

Also, **Taavoni et al.,(2013)** included 87 women who had entered menopausal period naturally. For every three women, one was allocated to the aromatherapy massage group, one to the massage therapy group, and one to the control group. Participants in the massage groups received 30 min massage sessions twice a week for four weeks. Odorless liquid petrolatum (“soft paraffin”) used with massage therapy groups and aromatic oils used for aromatherapy massage group. No treatment was given to participants in the control group, who continued with their usual daily routines. The massage was applied to the abdomen, thighs, and arms. The study results revealed that the most prevalent psychological symptoms for all women were: irritability, physical and mental exhaustion, anxiety, and depressed mood. Subjects who received massage therapy alone or with aromatic oils reported fewer symptoms after the sessions.

In the same line, **Lotfipour et al., (2015)** supported this result. Their study included evaluation for the effect of massage therapy on symptoms of depression in postmenopausal women. In this clinical trial, menopausal women were recruited based on the selection criteria and were randomly divided into three groups namely control, aromatherapy massage and massage group. In massage group, the women received a 30 min massage per week for 8 weeks duration, and the massage was done using effleurage. They found that massage improve depression symptoms. They interpret their finding as massage improves the brain’s bloodstream and strengthens the care and support feeling. Also **Oliveira et al., (2011)** who study the benefits of massage in postmenopausal women with insomnia they found improvement in sleep patterns in addition to significant improvement in depression and anxiety .

On the other hand, some studies have reported that there are no significant differences between massage with and without aromatherapy on improvement of psychological symptoms (**Soden et al., 2004**). Also **Kuriyama et al., (2005)** study psychological benefits of aromatherapy massage, they concluded that massaging only without aromatherapy affected the anxiety score but did not change participants’ depression score.

In the researcher point of view, psychological symptoms as mood-changes, irritability, and depression have been linked to hormonal changes. (**WHO1996&Soares 2017**). The beneficial effects of massage therapy might be due to increased levels of dopamine and serotonin and decreased level of cortisol and level of stress hormones (**Field 2005**). Through cutaneo-muscles stimulation on the surface of the body which occurs by massage, the receptors of touch, pressure, vibration, heat and pain are activated and these stimuli are transported to the central and autonomous nervous systems, unleashing neuro-chemical reactions. (**Guimaraes et al., 1997**).

In conclusion, the majority of previous studies were concerned with managing psychological symptoms with massage therapy and few studies conducted to evaluate effect of massage therapy on vasomotor, urinary, and vaginal symptom for women in transitional period. The current study results were agreed with previous studies who reported that massage therapy was beneficial for many transitional period symptoms.

IV. Conclusion And Recommendations:

Massage therapy is effective in reducing many menopausal transitional period symptoms. Significant improvements were observed in psychological symptoms, urinary symptoms. Number of hot flashes attacks and night sweats decreased significantly, and dysparunia alleviated. Providing gynecological clinics with nursing manuals and reputable online sources can help nurses to teach simple massage techniques. Ensure institutional support to incorporate massage into nurses' daily practice is important. Future researches are recommended to study effect of massage therapy on symptoms of transitional period of menopause with using other techniques of massage therapy and including large sample size.

Table (1) : Comparison between study and control group regarding to their vasomotor symptoms.

Vasomotor symptoms (hot flushes)	Study group					Control group					Sig.3	Sig.4	Sig.5
	Before	After 8 sessions	After 16 sessions	2 weeks follow up	Sig.1	Before	After 8 sessions	After 16 sessions	2 weeks follow up	Sig. 2			
Frequency													
<3/day	25 (67.6)	30 (81.1)	30 (81.1)	31 (83.8)	0.006	31 (83.8)	29 (78.4)	29 (78.4)	31 (83.8)	1	0.839	0.839	-----
3-9/day	10 (27)	6 (16.2)	6 (16.2)	4 (10.8)		4 (10.8)	6 (16.2)	5 (13.5)	4 (10.8)				
≥ 10/day	2 (5.4)	1 (2.7)	1 (2.7)	2 (5.4)		2 (5.4)	2 (5.4)	3 (8.1)	2 (5.4)				
Intensity													
Mild	10 (27.02)	17 (45.9)	23 (62.2)	23 (62.2)	0.101	31 (83.8)	29 (78.4)	28 (75.7)	28 (75.7)	0.98	0.01	0.144	0.17
Moderate	17 (45.9)	12 (32.4)	14 (37.8)	10 (27)		4 (10.8)	6 (16.2)	6 (16.2)	6 (16.2)				
Severe	10 (27.02)	8 (21.6)	--(---)	4 (10.8)		2 (5.4)	2 (5.4)	3 (8.1)	3 (8.1)				
Length of attack													
1-2 min.	15 (40.5)	17 (45.9)	15 (40.5)	21 (56.8)	F _{ttest} 0.455	27 (72.9)	28 (75.7)	29 (78.4)	29 (78.4)	0.79	0.05	0.59	1.00
3-5 min.	22 (59.4)	20 (54.1)	22 (59.5)	16 (43.2)		10 (27.1)	9 (24.3)	8 (21.6)	8 (21.6)				
Mean ± SD	2.76±1.16	2.54±1.17	2.81±967	2.27±7.73		2.46±0.99	2.32±944	2.27±962	2.27±96				
Night sweats													
Absent	3 (8.1)	5 (13.5)	17 (45.9)	19 (51.4)	0.000	--(---)	--(---)	--(---)	--(---)	1	0.005	0.000	0.00
No sleep interruption	11 (29.7)	30 (81.1)	16 (43.2)	14 (48.6)		27 (72.9)	27 (72.7)	27 (72.7)	27 (72.9)				
Interrupt sleep	23 (62.2)	2 (5.41)	4 (10.8)	4 (10.8)		10 (27.1)	10 (27.1)	10 (27.1)	10 (27.1)				

Sig.1: between the study group at different timings (P value for Freidman test) Sig.2: between the control group at different timings (P value for Freidman test)

Sig.3: between study and control groups after 8 sessions (P value for Chi-Square test) Sig.4: between study and control groups after 16 sessions (P value for Chi-Square test)

Sig.5: between study and control groups after 2 weeks follow up (P value for Chi-Square test)

*significant at P≤0.05

Table (2) : Comparison between study and control group regarding to their urinary symptoms.

Urinary symptoms		Study group					Control group					Sig.4	Sig.5	Sig.6
		Before	After 8 sessions	After 16 sessions	2 weeks follow up	Sig.1	Before	After 8 sessions	After 16 sessions	2 weeks follow up	Sig. 2			
Stress incontinence	No symptom	4 (10.8)	8 (21.6)	24 (64.9)	28 (75.7)	0.000	15 (40.5)	16 (43.2)	16 (43.2)	16 (43.2)	0.99	0.7	0.129	0.00
	1-3 w	27 (72.9)	29 (78.4)	13 (35.1)	9 (24.3)		21 (56.8)	20 (54.1)	21 (54.1)	20 (54.1)				
	Daily	6 (16.2)	--(---)	--(---)	--(---)		1 (2.7)	1 (2.7)	--(---)	1 (2.7)				
Urge incontinence	No symptom	5 (13.5)	15 (40.6)	27 (72.9)	31 (83.8)	0.000	20 (54.1)	21 (56.7)	21 (56.8)	21 (56.7)	0.99	0.139	0.144	0.00
	1-3 w	32 (86.5)	22 (59.4)	10 (27.1)	6 (16.2)		17 (45.9)	16 (43.3)	16 (43.2)	16 (43.2)				
	Daily	--(---)	--(---)	--(---)	--(---)		--(---)	--(---)	--(---)	--(---)				
Dysuria	No symptom	10 (27.02)	19 (51.4)	31 (83.9)	25 (67.6)	0.000	21 (56.8)	20 (54.1)	20 (54.1)	20 (54.1)	0.99	0.81	0.005	0.23
	1-3 y	27 (72.97)	18 (48.6)	6 (16.2)	12 (32.4)		16 (43.2)	17 (45.9)	17 (45.9)	17 (45.9)				
	Monthly	--(---)	--(---)	--(---)	--(---)		--(---)	--(---)	--(---)	--(---)				

Sig.1: between the study group at different timings (P value for Freidman test) Sig.2: between the control group at different timings (P value for Freidman test)

Sig.3: between study and control groups after 8 sessions (P value for Chi-Square test) Sig.4: between study and control groups after 16 sessions (P value for Chi-Square test)

Sig.5: between study and control groups after 2 weeks follow up (P value for Chi-Square test)

*significant at P≤0.05

Table (3) : Comparison between study and control group regarding to vaginal symptoms.

Vaginal Symptoms		Study group					Control group					Sig.3	Sig.4	Sig.5	
		Before	After 8 sessions	After 16 sessions	2 weeks follow up	Sig.1	Before	After 8 sessions	After 16 sessions	2 weeks follow up	Sig.2				
Dysparunia; pain, burning or soreness															
Yes (only married women)		18 (48.6)	4 (10.8)	2 (5.4)	2 (5.4)	0.000	19 (51.4)	20 (54.1)	20 (54.1)	20 (54.1)	0.993	0.000	0.000	0.00	
No (married & unmarried women)		19 (51.4)	33 (89.2)	35 (94.6)	35 (94.6)		18 (48.6)	17 (45.9)	17 (45.9)	17 (45.9)					
Abnormal vaginal discharge															
Absent		13 (35.1)	13 (35.1)	15 (40.5)	11 (29.7)	0.472	21 (56.7)	21 (56.7)	23 (62.2)	22 (59.5)	0.738	0.008	0.007	0.000	
Present		24 (64.9)	24 (64.9)	22 (59.5)	26 (70.3)		16 (43.2)	16 (43.2)	14 (37.8)	15 (40.5)					

Sig.1: between the study group at different timings (P value for Freidman test) **Sig.2:** between the control group at different timings (P value for Freidman test)
Sig.3: between study and control groups after 8 sessions (P value for Chi-Square test) **Sig.4:** between study and control groups after 16 sessions (P value for Chi-Square test)
Sig.5: between study and control groups after 2 weeks follow up (P value for Chi-Square test)
 *significant at P≤0.05

Table (4) : Comparison between study and control group regarding to their menstrual characteristics.

Menstrual history	Study group					Control group					Sig. 3	Sig. 4	Sig. 5	
	Before	After 8 sessions	After 16 sessions	2 weeks follow up	Sig.1	Before	After 8 sessions	After 16 sessions	2 weeks follow up	Sig.2				
Menstrual Interval														
20-25 days	17(45.95)	16(43.24)	16(43.24)	16(43.24)		10(27.03)	11(29.73)	11(29.73)	11(29.73)					
26-60 days	20(54.05)	21(56.76)	21(56.76)	21(56.76)		27(72.97)	26(70.27)	26(70.27)	26(70.27)					
Mean ± SD	26.67±6.16	26.6±6.17	27.24±8.56	27.24±8.95	0.97	29.57±12.18	27.75±4.86	27.75±7.74	27.75±7.74	One way ANOVA 0.59	0.45	0.79	0.79	
Pain during menses														
No pain	5(13.51)	6(16.22)	12(32.43)	9(24.32)	0.0015	15(40.54)	15(40.54)	15(40.54)	15(40.54)	Chisquare test 0.99	0.001	0.000	0.000	
Mild (0-3)	8(21.62)	12(32.43)	19(51.35)	16(43.24)		3(8.11)	3(8.11)	3(8.11)	3(8.11)					
Moderate (4-7)	12(32.43)	13(35.14)	6(16.22)	10(27.03)		5(13.51)	5(13.51)	4(10.81)	4(10.81)					
Severe (8-10)	12(32.43)	6(16.22)	0(0)	2(5.41)		14(37.84)	14(37.84)	15(40.54)	15(40.54)					

Sig.1: between the study group at different timings (P value for Freidman test) **Sig.2:** between the control group at different timings (P value for Freidman test)
Sig.3: between study and control groups after 8 sessions (P value for Chi-Square test) **Sig.4:** between study and control groups after 16 sessions (P value for Chi-Square test)
Sig.5: between study and control groups after 2 weeks follow up (P value for Chi-Square test)
 *significant at P≤0.05

Table (5) : Comparison between study and control group regarding to psychological symptoms.

Psychological symptoms		Study group					Control group					Sig.3	Sig.4	Sig.5
		Before	After 8 sessions	After 16 sessions	2 weeks follow up	Sig.1	Before	After 8 sessions	After 16 sessions	2 weeks follow up	Sig.2			
Irritability	Mild	2(5.41)	4(10.8)	18(48.6)	20(54.1)	0.000	6(16.2)	7(18.9)	7(18.9)	8(21.6)	0.998	0.59	0.03	0.00
	Moderate	12(32.4)	19(51.4)	11(29.7)	16(43.2)		18(48.6)	17(45.9)	17(45.9)	18(48.6)				
	Severe	23(62.2)	14(37.8)	8(21.6)	2(10.8)		13(35.2)	12(32.4)	12(32.4)	11(29.7)				
Severity of depression symptoms	None	2(5.41)	8(21.6)	23(62.2)	20(54.1)	0.000	11(29.7)	10(27.1)	10(27.1)	10(27.1)	0.99	0.000	<0.00	
	Mild	16(43.2)	13(35.1)	12(32.4)	17(45.9)		5(13.5)	4(10.8)	4(10.8)	4(10.8)				
	Moderate	14(37.8)	16(43.2)	2(5.4)	--(-)		10(27.1)	12(32.4)	11(29.7)	13(35.1)				
	Severe	5(13.5)	--(-)	--(-)	--(-)		11(29.7)	11(29.7)	12(32.4)	10(27.1)				

Sig.1: between the study group at different timings (P value for Freidman test) **Sig.2:** between the control group at different timings (P value for Freidman test)
Sig.3: between study and control groups after 8 sessions (P value for Chi-Square test) **Sig.4:** between study and control groups after 16 sessions (P value for Chi-Square test)
Sig.5: between study and control groups after 2 weeks follow up (P value for Chi-Square test)
 *significant at P≤0.05

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