The Psychological Effects of Aromatherapy-Massage in Healthy Postpartum Mothers

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This study examined the effect of aromatherapy-massage in healthy postpartum mothers. A quasi-experimental between-groups design was used. Mothers who received aromatherapy-massage were compared with a control group who received standard postpartum care. Thirty-six healthy, first-time mothers with vaginal delivery of a full-term, healthy infant participated in this study. Sixteen mothers received a 30-minute aromatherapy-massage on the second postpartum day; 20 mothers were in the control group. All mothers completed the following four standardized questionnaires before and after the intervention: 1) Maternity Blues Scale; 2) State-Trait Anxiety Inventory; 3) Profile of Mood States (POMS); and 4) Feeling toward Baby Scale. In the aromatherapy-massage group, posttreatment scores significantly decreased for the Maternity Blues Scale, the State-Anxiety Inventory, and all but one of the Profile of Mood States subscales. Posttreatment scores in the intervention group significantly increased in Profile of Mood States-Vigor subscale and the Approach Feeling toward Baby subscale. Scores in the intervention group significantly decreased in Conflict Index of Avoidance/Approach Feeling toward Baby subscale. Our results suggest that aromatherapy-massage might be an effective intervention for postpartum mothers to improve physical and mental status and to facilitate mother-infant interaction. J Midwifery Womens Health 2006;51:e21–e27

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INTRODUCTION

The postpartum period is critical for new mothers and their families. A new mother's physical and mental status could be adversely affected by increased tension, anxiety, and fatigue.[1]

Researchers have studied postpartum mood changes including maternity blues, anxiety, and depression since the 1960s. Maternity blues is defined as "a transitory mood disturbance, which includes feelings of irritability, anxiety, headache, confusion, forgetfulness, and depersonalization, as well as elation, appearing for a week or more."[2,3] The overall incidence of maternity blues is estimated from 26% to 85% among postpartum mothers in Western countries,[4] whereas it is estimated at approximately 25%[5] to 35%[6] in Japan. Although maternity blues is a transitory and brief episode of mood disturbance, it is strongly associated with postpartum depression.[6,7]

Maternity blues consists of physical discomfort and psychological difficulties, and "physical and emotional stresses make this time one of anxiety or even depression."[8] It is essential to prevent new mothers from experiencing the deterioration of physical and mental status. Studies indicate that emotional, tangible, and practical help and informational support are positively related to a mother's mental and physical health.[9,10] Moreover, concrete and direct comfort measures, such as aromatherapy and/or massage, may represent preventive interventions that can improve postpartum physical and mental conditions for mothers. These measures have recently been practiced around the time of birth and in the postpartum period in clinical settings by nurses and midwives.[11,12]

Massage is recognized as a complementary or alternative therapy.[13] In the peripartum period, the effects of massage in infants, pregnant women, mothers, and fathers have been studied for 20 years.[14–16] These studies have confirmed the use of massage is effective for reducing labor pain, decreasing stress hormones, alleviating depression and anxiety, and increasing interactive behaviors between parent and child. Field et al.[17] conducted a study that compared the effects of massage with relaxation for depressed adolescent mothers. In this study, massage therapy was more effective than relaxation therapy for decreasing depression and anxiety.

Aromatherapy is an intervention using various fragrant oils (essential oils) extracted from plants. The effects of aroma in combination with footbaths[18] or warm perineal baths[19] in the peripartum period have been investigated. These studies suggested that an aroma bath might de-

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crease fatigue, pain, and discomfort and facilitate perineal wound healing. Aromatherapy-massage is massage using odorless carrier oils with essential oils, which percutaneously enter the body. Most of the studies on the effects of aromatherapy-massage have been conducted in palliative care,[20,21] ICU care,[22,23] and the field of mental health.[24] These studies have reported that massage—including foot massage or body massage, with or without aroma—alleviated anxiety and pain and improved moods and well-being.

Few studies have been conducted on the effects of aromatherapy-massage on postpartum mothers in maternity care settings. Yuhara et al.[25] conducted a between-group comparison study of the effects of aromatherapy-massage and bed rest. There were no significant differences between the 2 groups on electrocardiogram (ECG): coefficient of variance of heart rate variability (CV_{RR}); serum norepinephrine; and Profile of Mood States scores.

The purpose of this study was to investigate the effects of full-body aromatherapy-massage on various mood states of normal postpartum mothers. In addition, the effects of aromatherapy-massage on mothers' feelings toward their babies were explored. Although there are at least 2 variables in aromatherapy-massage, olfactory stimulation, and somatosensory stimulation, aromatherapy-massage in most clinical settings is usually put into practice as simply "aromatherapy-massage." Thus, we first examined the effects of aromatherapy-massage, not with the divided variables (aroma and massage), but as one integrated intervention.

METHODS

A quasi-experimental between 2 groups designed with convenience sampling was used in this study. The study was conducted at a middle-sized hospital in urban Tokyo between December 2002 and June 2004. Eligible mothers satisfied the following inclusion criteria: 1) age between 20 and 40 years old, 2) married, 3) no serious chronic medical conditions, 4) primipara, 5) full-term normal vaginal delivery, 6) no clinically abnormal findings in neonatal examinations, and 7) Japanese ethnicity.

The researcher explained the research protocol to eligible mothers, who received a leaflet on the first postpartum day in the maternity ward. Those who gave informed consent were consecutively enrolled and assigned to either the control group or the aromatherapy-massage group.

The following 4 instruments were administered: 1) Maternity Blues Scale (Japanese version). Stein[26] developed a scale for measuring maternity blues in 1980. It consists of 13 items with a 0-1 to 0-5 Likert scale; possible scores range from 0 to 26 points. The version used in the study was translated into Japanese in 1991.[5] External validity of this scale has been confirmed.[27] A score of 8 or higher indicates a diagnosis of maternity blues.[5,27] 2) Profile of Mood States (Japanese version). McNair et al.[28] developed a scale for measuring moods in 1971. The version used in the study was translated into Japanese in 1990.[29] The Profile of Mood States rates 6 subcategories: Tension-Anxiety, Depression-Dejection, Anger-Hostility, Vigor, Fatigue, and Confusion. The scale has adequate concurrent validity and good internal consistency ($r = .95$). The subcategories of the Japanese version have adequate reliability (Cronbach's $\alpha = .779$) and concurrent validity ($r = .368$ to $r = .551$).[29,30] 3) State-Trait Anxiety Inventory (STAI, Japanese version). Spielberger et al.[31] developed a scale for measuring state and trait anxiety in 1970, and the version used in the study was translated into Japanese in 1991.[32] The STAI comprises 20 items and assesses how the subject feels at that moment in terms of severity. The STAI scores increase in response to stress and decrease under relaxing conditions. Research has demonstrated that the STAI has adequate concurrent validity and internal consistency ($r = .83$). Reliability (Cronbach's $\alpha = .92$)[33] and validity of the subcategories in the Japanese version have been demonstrated. A State-Anxiety score of 42 or higher indicates a high anxiety level; a score from 31 to 41 signifies a normal anxiety level; and a score from 22 to 30 indicates a low anxiety level. 4) Revised Feelings toward Baby Scale. Hanazawa[34] developed a Japanese version of the Revised Feelings toward Baby Scale in 1992. This scale consists of 28 adjective items rating "Approach" or "Avoidance" toward one's own baby; ratings are on a 4-point scale from "not at all" to "extremely." In addition, the Degree of Conflict Index (calculated as the Avoidance Feeling score/Approach Feeling score $\times$ 100) reflects ambivalence in a mother's feeling toward her baby. Possible scores range from 0 to 52. Reliability and concurrent validity for this scale were demonstrated ($r = .85$).

In the morning of the second postpartum day, mothers in the aromatherapy-massage group completed the questionnaires before and after receiving a 30-minute aromatherapy-massage. The mothers of the control group completed the same questionnaires with the same 60-minute interval as the aromatherapy-massage mothers.

The participants in the aromatherapy-massage group

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received a 30-minute massage from a certified nurse-midwife who has 20 years of clinical experience. She completed a 1-year training course in aromatherapy and massage and is a certified aromatherapy instructor. The participants received aromatherapy-massage while lying in bed, in clean, single hospital rooms in the maternity ward. The room temperature was kept between 24°C and 26°C, the window blind was closed, and the room lights were turned off during the massage.

Aromatherapy-Massage Procedure

The principal investigator developed the massage procedure with advice from a certified Anma-Massage-Acupressure therapist and 4 certified nurse-midwives with more than 15 years of clinical experience. Participants were first treated in the prone position. The massage procedure was:

Back: slow strokes parallel to the spine.

Neck/shoulder: slow strokes from the neck to the shoulder and firm strokes along the side of the shoulder blade.

Buttocks: simultaneous strokes from the buttocks to the iliac crest.

Back/shoulder/hands: slow, hand-over-hand strokes parallel to the spine from the base of the spine to the shoulders, and then along the arms and past the end of the hands.

Hands/fingers: press the fleshly part of the palm between the thumb and index finger; gently squeeze and lightly pull each finger; and then stroke slowly from the shoulder past the end of the fingers.

Participants were then treated in the supine position. The massage procedure was:

Torso: placing the hand gently on the solar plexus and adding a gentle rocking motion from side to side.

Chest/hollow of clavicula: simultaneously placing the hand gently on the hollow of the clavicula, using slow strokes from the sides of the chest to the axilla and shoulders.

Shoulder to neck/head: slowly stroke from the shoulders to the back of the head, pulling the neck.

Legs: long and slow strokes from the foot to the thigh.

Feet: friction from the toe to the heel, making circles over the ankle.

Oils used in the massage contained Neroli (*Citrus aurantium*) and Lavender (*Lavendula officinalis*), which have been anecdotally reported effective for stress and anxiety in the peripartum period.[35] Sedative effects of these essential oils have also been reported.[36,37] The massage oil was compounded by using 3 drops of Neroli and 7 drops of Lavender per 100 mL of Squalane. The concentration of essential oils was thus 0.5% (1 drop is converted into .05 mL).

Control Group Procedure

The participants of the control group stayed with their babies in single hospital rooms and received standard care in the maternity ward. The room environment was the same as the aromatherapy-massage group.

The Statistical Package for the Social Sciences (SPSS) version 12.0 J for Windows was used for all analyses. Univariate analyses were conducted to evaluate differences in the demographic characteristics and preintervention questionnaire scores between 2 groups. Differences in pre- and posttest scores of each questionnaire were calculated and compared between the 2 groups. A P value less than .05 was set as the level of statistical significance.

This study was approved by the ethics committee at the hospital where it took place. Written informed consent was obtained from the participants.

RESULTS

The 36 eligible mothers meeting the inclusion criteria were enrolled, and no one refused or dropped out during the study period. The mean ($\pm$SD) age of all participants in this study was 31.9 $\pm$ 4.2, and the range was from 24 to 39. The 2 groups were similar in demographic and birth characteristics (Table 1).

There were no significant differences between groups on the mean pretest scores of each questionnaire. Table 2 shows the results of the comparison of the 2 groups on the Maternity Blues and State-Anxiety scales.

The results showed that mothers in the aromatherapy-massage group experienced significantly lower maternity blues scores after receiving aromatherapy-massage than those of the control group. By using a clinical cutoff point (a score of 8 or higher) to indicate maternity blues, there were 5 mothers (31.3%) in the aromatherapy-massage group whose baseline scores before the session indicated this diagnosis and 3 mothers (15%) in the control group. After completing the session, no mothers had posttest scores indicating maternity blues in the aromatherapy-massage group; 2 mothers (10%) in the control group had scores indicating maternity blues (P = .035).

The scores on the State-Anxiety instrument were also significantly lower in mothers in the aromatherapy-massage group. By using a clinical cutoff point (a score of 42 or higher) to indicate high anxiety, there were 5 mothers in each group whose baseline scores indicated high anxiety. After the session, all of these mothers in the aromatherapy-massage group came down into the normal (31–41) or low anxiety range (22–30). On the other hand, all 5 mothers in the control group, whose scores

Table 1. Demographic and Birth Characteristics Among 36 Mothers and Infants*

Variables	Group: Aromatherapy-Massage (n = 16)	Group: Control (n = 20)	*P* Value†
Mother			
Age (y)	31.6 (4.6)	32.3 (3.9)	.679
Education (%)			.418
High school	2 (12.5)	1 (5.0)	
College	14 (87.5)	19 (95.0)	
Occupation (%)			.400
House wife	11 (68.8)	11 (55.0)	
Full-/part-time job	5 (31.3)	9 (45.0)	
Duration of delivery (min)	551.3 (308.4)	699.7 (372.2)	.209
Blood loss (mL)	330.6 (171.9)	266.1 (143.2)	.227
Infant			
Gestational age (wk)	39.6 (1.0)	39.6 (1.2)	.982
Apgar score	9.1 (0.7)	8.8 (1.0)	.266
Birth weight (g)	2880.1 (325.5)	3021.4 (357.5)	.299
Gender (%)			.214
Male	5 (31.3)	10 (50.0)	
Female	11 (68.8)	10 (50.0)	

*Values are means (SDs) unless otherwise noted.

†Based on *t* test or χ^2 test as appropriate.

indicated high anxiety, still remained at the high anxiety level ($P = .002$).

Table 3 shows the results of the Profile of Mood States subscales between groups. Mothers in the aromatherapy-massage group showed significantly lower scores on Tension-Anxiety, Depression-Dejection, Anger-Hostility, Fatigue, and Confusion subscales. After the massage session, they had higher scores on the Vigor subscale than

Table 2. Differences in Pre- and Posttest Scores on the Maternity Blues and State-Anxiety Instruments for the Aromatherapy-Massage and the Control Groups*

Scale	Group: Aromatherapy-Massage (n = 16)	Group: Control (n = 20)	*P* Value†
Maternity Blues, mean	−3.4 (2.3)	−0.6 (1.8)	
Maternity Blues, median	−3.5 (−5.0, −1, 0)	−0.5 (−2.0, 0.0)	.001
State-Anxiety (STAI), mean	−13.4 (7.5)	−0.9 (5.3)	
State-Anxiety (STAI), median	−11.5 (−15.8, −9.0)	−0.0 (−4.0, 0.8)	.0001

*Values are means (SDs) and medians (25 percentile, 75 percentile).

†Based on Mann-Whitney *U* test.

Table 3. Differences in Pre- and Posttest Scores on the Profile of Mood States (POMS) Instrument for the Aromatherapy-Massage and the Control Groups*

Subscales of POMS	Group: Aromatherapy-Massage (n = 16)	Group: Control (n = 20)	*P* Value†
Tension-Anxiety, mean	−8.9 (6.2)	−1.4 (4.7)	
Tension-Anxiety, median	−7.0 (−13.5, −4.0)	−1.5 (−5.5, −0.8)	.001
Depression-Dejection, mean	−3.1 (4.0)	0.0 (3.9)	
Depression-Dejection, median	−2.0 (−3.8, −1.0)	0.0 (−1.8, 0.0)	.015
Anger-Hostility, mean	−2.6 (3.9)	−0.2 (1.3)	
Anger-Hostility, median	−1.0 (−3.5, 0.0)	0.0 (−0.8, 0.0)	.006
Vigor, mean	4.4 (4.9)	0.0 (3.1)	
Vigor, median	5.0 (0.3, 8.8)	0.0 (1.8, 2.0)	.008
Fatigue, mean	−6.3 (5.7)	−0.5 (3.7)	
Fatigue, median	−4.0 (−9.8, −2.0)	−1.0 (−3.8, 2.0)	.001
Confusion, mean	−3.4 (2.8)	−1.3 (1.7)	
Confusion, median	−3.0 (−4.8, −1.3)	−1.0 (−2.8, 0.0)	.009

*Values are means (SDs) and medians (25 percentile, 75 percentile).

†Based on Mann-Whitney *U* test.

the control group. All mothers (100%) in the aromatherapy-massage group showed decreased the scores on Tension-Anxiety and Fatigue subscales after the session. In the control group, 12 mothers (60%) decreased these scores, and 8 mothers (40%) increased or did not change their scores ($P = .016$).

The results on the Feelings Toward Baby Scale in the aromatherapy-massage group showed that the scores on the "Approach" Feeling Toward Baby subscale were significantly higher ($P = .005$), whereas the scores of "Avoidance" Feeling were a little lower ($P = .097$). As a result, in the aromatherapy group, the scores on the Conflict Index of Avoidance/Approach Feeling Toward Baby were significantly lower ($P = .013$).

DISCUSSION

The results of this study indicate that mothers in the aromatherapy-massage group had significantly lower scores on scales measuring Maternity Blues, State-Anxiety, and 5 of the 6 subscales of Profile of Mood States: Tension-Anxiety, Anger-Hostility, Depression-Dejection, Fatigue, and Confusion. They also had higher scores on the Profile of Mood States subscale "Vigor" after the

massage session than those in the control group. In addition, they had higher scores on "Approach" Feeling and lower scores on "Avoidance" Feeling, which resulted in lower scores on the composite score of Conflict Index of Avoidance/Approach Feeling.

The effects of the aromatherapy-massage seen in the lower scores on anxiety and depression were consistent with other massage studies of depressed mothers.[17] The lower scores on anxiety measures also are seen with other aromatherapy-massage studies on patients in palliative[20,21] or postoperative ICU care.[22,23] According to the Cochrane Database Systematic Review[38] on the effects of aromatherapy and massage for cancer patients, the positive effect most consistently found from massage or aromatherapy-massage was on anxiety, but effects on depression, fatigue, anger, and hostility were variable. The researchers suggested replications were needed to strengthen the evidence for these factors. It was confirmed in this study that aromatherapy-massage decreased Fatigue, Anger-Hostility, and Confusion and increased Vigor subscale scores in the aromatherapy-massage group compared with the control group.

We noted that the mothers in the aromatherapy-massage group whose baseline scores indicated maternity blues and high anxiety showed a shift to normal limit scores after the intervention, whereas those in the control group remained in the same or higher scores over the same period of time.

Our results could have been influenced by the emotional support the mothers received through the aromatherapy-massage, by being touched gently and warmly by other people.[39] Both emotional and physical support was provided at the same time by the midwife, one of the essential aims of postnatal care.[40] When new mothers have sufficient physical and emotional support from others, negative feelings may be alleviated during the "taking in phase,"[41] allowing more energy and awareness of the baby, which might assist in the transition to motherhood.

The positive effects of aromatherapy-massage as an olfactory-somatosensory-tactile integrated therapy were seen in this study. These results suggest the need for further investigation. Aromatherapy-massage consists of many factors. It is a complex process, including rest, aroma for olfactory stimulation, and receiving massage as somatosensory, tactile stimulation. In previous massage studies,[14–17,20–25,42,43] each intervention mentioned above was effective in alleviating "negative" mental status. On the other hand, some of the studies[20–23] reported that there were no significant differences between massage with and without aroma. This finding suggests that the effects of the aromatherapy-massage in this study would mainly come not from the aroma intervention but from the massage intervention. However, effects of olfactory stimulation using essential oils have been demonstrated in the experimental animal,[36,37] in human studies,[44]and in dental clinical settings.[45]

If massage with or without aroma has the same effects on the mother's physical and mental conditions, use of essential oils will not be necessary for postpartum massage therapy. The mother's original smell,[46,47] is an important stimulus for the newborn. Hence, a key point for midwives is not to disturb the mother's original smell and/or the smell of breast milk, but to maintain a newborn-friendly olfactory environment. On the other hand, if the effects of essential oils in aromatherapy-massage are confirmed in clinical settings, clinicians can positively use them for more purposes.

Limitations of the study include the quasi-experimental design. Although baseline demographic and questionnaire data suggested that the 2 groups were similar, a randomized trial should be carried out to support our findings. Another limitation of this study comes from the small sample size and the fact that there was only 1 intervention that combined 2 forms of therapy: massage and aromatherapy. Finally, the study only assessed short-term effects over a period of 1 hour; long-term effects were not tested in this study.

In summary, our results suggest that aromatherapy-massage can improve mental status and feelings toward the baby for healthy postpartum mothers compared with women in a no intervention group. Additional study is needed to identify the relative benefits of the addition of aromatherapy to massage, the effective duration of massage, and the added effects of aromatherapy-massage in addition to emotional support for postpartum mothers.

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