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THE EFFECT OF EFFLEURAGE MASSAGE ON LABOR PAIN, ANXIETY LEVEL, AND DURATION OF LABOR: A RANDOMIZED CONTROLLED TRIAL

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Abstract

Objective: The aims was to investigate the effects of effleurage massage on pregnant women's anxiety level, the degree of their labor pain, and the duration of their labor process.

Methods: This randomized controlled study was conducted with 64 pregnant women, divided into two groups. The pregnant women in the experimental group underwent effleurage message for 30 minutes when dilatation was D_1 (3-4 cm), D_2 (5-6 cm) and D_3 (8-9 cm), and all women received routine care. Data were collected using the Socio-demographic Form, State and Trait Anxiety Inventories, Visual Analogue Scale, Labor Process Assessment Form, and the End of Labor Assessment Form.

Results: The experimental group pain scores and anxiety scores were significantly lower than controls (p=0.001 and; p<0.05, respectively). Furthermore, the labor duration of the experimental group was significantly shorter than controls (p=0.001).

Conclusion: Effleurage massage appears to be effective in reducing labor pain and anxiety, and also shortened the duration of labor in this population.

Keywords: *Anxiety, effleurage, labor, pain, pregnant.*

Introduction

Labor is a physiological process in which the fetus and the products of conception are expelled into the external environment by regular and painful uterine contractions with dilation and effacement of the cervix, but it is also an emotional, complex and individual experience that has psychological effects and includes pain, fatigue, fear and stress.[1-4]

Labor pain is one of the most severe acute pain types known, experienced as both visceral and somatic pain.[3,5] Labor pain is different from other types of pain; it is part of a natural process that the mother voluntarily endures for her baby, is expected and a preparation process, and occurs at certain intervals.[5,6] Although labor pain is physiological, unmanaged labor pain has negative effects on the health of the mother and the fetus.[7]

Anxiety is an adaptation mechanism that helps individuals cope with a threat or distress.[8] The birth process is a stressful experience. Stress is defined as the uncertain outcome of any demand placed on the body.[9] Anxiety caused by the unknown and fear of birth are important factors affecting the birth process.[10] Studies examining the anxiety rates of women in labor have reported values ranging from 32.6%[9] to 51.7%[11]. Stress in the mother due to labor pain activates the mother's sympathetic nervous system, increasing the release of Adrenocorticotropic hormone (ACTH), cortisol, epinephrine, norepinephrine and beta-endorphin.[5] Anxiety during labor causes an increase in stress hormones (adrenaline, noradrenaline and dopamine). These hormones reduce uterine blood flow and uterine contraction activity. These hormonal effects, which are directly caused by anxiety and stress related to birth, are reported to increase the perception of labor pain, prolong labor, lead to operative delivery, and have negative effects on the fetus and newborn.[9,10] Long labor periods have negative effects on the health of the mother and fetus.[12,13]

Midwives have assisted in birth in all cultures with the responsibility of ensuring a healthy birth process that is safe for the mother and the baby, with the least possible intervention, using mostly natural techniques. For a healthy birth process, the hormones that play a role in birth must be in a certain harmony. In this process, midwives have the responsibility to reduce anxiety during birth and control labor pain, shorten the labor period and end it in the healthiest way for the mother and the baby, and to independently perform non-pharmacological methods such as massage in cooperation with the pregnant woman for these purposes.[7-19]Boateng et al.[20] reported that all midwives and nurses were awere that non-pharmacological methods are utilized for managing labor pain. They most frequently employed sacral massage, deep breathing exercises, and diversional therapy.

Massage is a traditional treatment method used for centuries in many cultures for the relief and treatment of many diseases.[21] Swedish massage is a type of massage therapy intended to relieve muscle tension by applying pressure to muscles and bones, which enhances blood flow.[22,23] Swedish massage is also known as classical massage. The basic movements/techniques in Swedish massage are effleurage, petrissage, friction, tapotement and vibration; vibration was added in the early 19th century.[24] Each session usually lasts 30 to 60 min., which may include some or all of the basic techniques, and the massage usually begins on the back.[21-25] Swedish massage has been widely used in physiotherapy since the first half of the 20th century.[26,27] The Swedish effleurage massage technique involves circular, long, sliding movements of the muscles from proximal to distal using the palms of both hands.[22,23] It is anticipated that the use of the effleurage massage technique during the birth process will increase the pregnant woman's ability to cope with pain, reduce anxiety levels, shorten the duration of labor, and thus reduce the risk of both the mother and the fetus from complications related to labor.[22,23] The use of effleurage massage during labor activates gate control mechanisms at the spinal cord level by reducing sensory interactions and stimulating the release of endogenous opioids. Massage helps reduce hypoxia by relieving muscle spasms and stimulating the nervous system to release substances like endorphins and serotonin. This in turn, increases the pain threshold, making it effective for pain relief.[28]

Several previous studies have reported the beneficial effects of massage during labor on reported pain and anxiety and the actual labor process;[1,4,6,8,29-32] However, the effleurage massage technique used in the current study differs from these previous studies in terms of the method of application, areas where it is applied, duration of massage, sample groups, data collection and processing.

This study is a randomized controlled trial aimed at investigating the effects of effleurage massage techniques on maternal labor pain, anxiety levels and the labor process.

Research Hypotheses

H_1: Using the effleurage massage technique is effective in decreasing women's anxiety levels in the labor process.

H_2: Using the effleurage massage technique is effective in decreasing women's labor pain in the labor process.

H_3: Using the effleurage massage technique is effective in shortening the duration of labor in the labor process.

Methods

Study Setting

This study was conducted at the Maternity and Children's Hospital, which provides health services in Adana province in the southern region of Turkey. The hospital was selected for the study because it was be only maternity hospital in the city at the time the research was conducted.

Target Population and Sample

The target population was all pregnant women who were admitted to the delivery room of the hospital between the 1st of March and the 30th of May, 2017. In this hospital, the number of vaginal deliveries was approximately 10,000 per year in 2016. A power analysis was performed using Medcalc for the sample size. The standard deviation of the pain scale values was accepted as 0.7 in various measurements. Identification of the differences between the groups at α=0.05, β=0.20 required 32 pregnant women in the experimental group and 32 pregnant women in the control group; the sample of the study thus included 64 pregnant women.[33,34]

The experimental and control groups in this study were identified using simple randomization. Randomization was performed according to the days of the week, thus preventing researcher selection bias when assigning the participants to the experimental and control groups.[35] The pregnant women admitted to the hospital on Wednesdays, Fridays, and Sundays formed the experimental group, and those who were admitted on Mondays, Tuesdays, and Saturdays formed the control group, while women presenting on Thursdays were not included.

Inclusion criteria for the participants were as: pregnant women who volunteered to participate in the study; who were primipara; who were in their 38th to 42nd gestational week; who had a dilatation of 3 cm or more; who had a single fetus with cephalic presentation; and who could speak Turkish. Those who received induction, who used labor anesthesia/analgesics, and who had a risky pregnancy were excluded.

Data Collection Tools

Data were collected through the Socio-demographic Form (SDF), the State Anxiety Inventory (STAI-S) and the Trait Anxiety Inventory (STAI-T), the Visual Analogue Scale (VAS), the Labor Process Assessment Form (LPAF), and the End of Labor Assessment Form (ELAF).

Socio-demographic Form (SDF): The SDF is composed of 23 questions including 7 questions about the pregnant women's socio-demographic features and 16 questions about their obstetrics features. The form was developed by the researchers in line with the literature review.

State Anxiety Inventory (STAI-S) and Trait Anxiety Inventory (STAI-T): The STAI-S and STAI-T scales were developed by Spielberger, Gorsuch and Lushene in 1970, and Turkish language validity and reliability were performed by Öner and Le Compte in 1983.[36] They comprise two scales with a 4-point Likert scale that includes 20 items in each for measuring state and trait anxiety. While the STAI-T includes the options (1) "not at all", (2) "somewhat", (3) "moderately so", and (4) "very much so", the STAI-S includes the options of (1) "rarely ", (2) "sometimes", (3) "often", and (4) "almost always". While the positive statements in the scales indicate negative emotions, reverse statements indicate positive emotions. When the reverse items are scored, values of 1 are converted to 4, and values of 4 are converted to 1. Items 1, 2, 5, 8, 10, 11, 15, 16, 19, and 20 are the reverse statements in the STAI-S, and items 21, 26, 27, 30, 33, 36, and 39 are the reverse statements in the STAI-T. The scores on each scale range between 20 and 80. Higher scores indicate a higher anxiety level.[36]

Visual Analogue Scale (VAS): The severity of maternal pain associated with the labor process was measured with VAS. VAS is a 10cm scale divided into ten equal intervals with the "no pain" statement on the left and the "extreme pain" statement on the right. Each interval indicates an increasing level of pain represented by the numbers from left to right.[37]

Labor Process Assessment Form (LPAF): The form was prepared by the researchers to collect clinical data including fetal heart rate (FHR), cervical opening dimension, contraction severity, pulse, systolic blood pressure (SBP), diastolic blood pressure (DBP), and body temperature.

End of Labor Assessment Form (ELAF): The form was prepared by the researchers to collect outcome data including time of birth, newborn APGAR scores, maternal health, the level of satisfaction concerning the massage, and a desire for having massage in subsequent labors.

To identify the comprehensibility and usability of the de nova data collection forms, 10 pregnant women were included in a pilot study. After the necessary revisions were made in line with the results obtained, the data collection tools were finalized. The women who participated in the pilot study were not included in the sample group.

Data Collection

Data were collected by the researcher using the SDF, VAS, STAI-T, STAI-S, LPAF, and ELAF through face-to-face interviews and based on maternal self-reportings.

The pregnant women in the experimental group were administered effleurage massage for 30 minutes when dilatation was D_1 (3-4 cm), again when dilatation was D_2 (5-6 cm) and a third intervention when D_3 (8-9 cm), and they also received routine care practices. The pregnant women in the control group received only routine care practices. The routine practices included introducing the delivery room, informing about the labor process, and administering vital signs, non-stress test (NST), contraction, effacement, and dilatation follow-ups every two hours. During the labor process, the pregnant women were not administered any routine non-pharmacological methods by midwives (Figure 1).

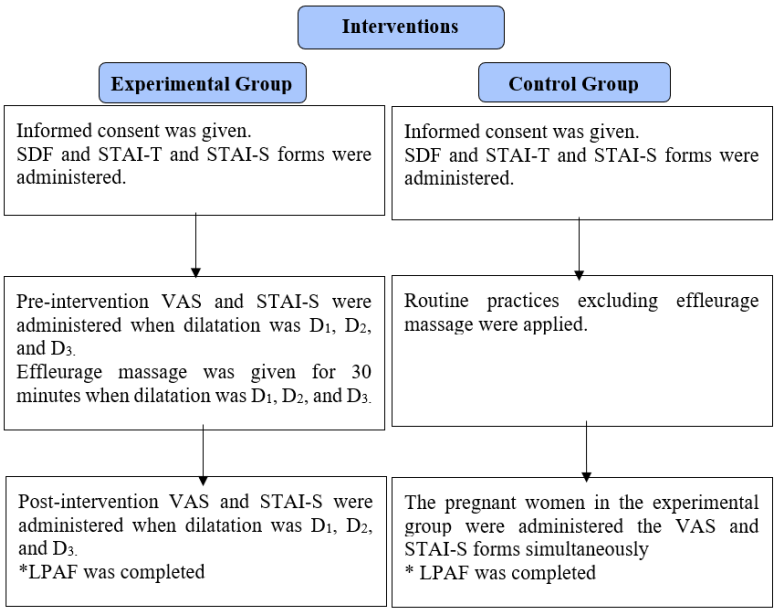

Figure 1. Intervention in experimental and control groups.

Massage Procedures with the Effleurage Technique

Data were collected within three months by one researcher according to the randomization on the days determined for the experimental and control groups. After the woman was informed about the purpose of the study and her informed consent was received, the privacy of the pregnant woman was protected. The researcher washed her hands, kept them at body temperature, and found a comfortable position for her and the pregnant woman. The researcher applied liquid Vaseline to her hands and gave the pregnant woman an effleurage massage for 30 min. (including during contraction), involving 10 min. on her hips and sacrum, 10 min. on her waistline and shoulders, 5 min. on her left and right hands, and 5 min. on the left and right feet. Once the pregnant woman involved in the study gave birth and was sent to the postnatal care clinic, another pregnant woman was accepted for follow-up. The researcher followed up with the pregnant woman until they gave birth and were sent to the postnatal care clinic.

The researcher who gave massage to pregnant women completed her undergraduate degree in the midwifery department and received five days of theoretical and practical training on effleurage massage technique from an expert in physical therapy and rehabilitation. Following the course, the researcher did her apprenticeship in a physical treatment and rehabilitation clinic for 15 days. The researcher received a theoretical and practical exam administered by an expert trainer, and she performed successfully (Figure 2).

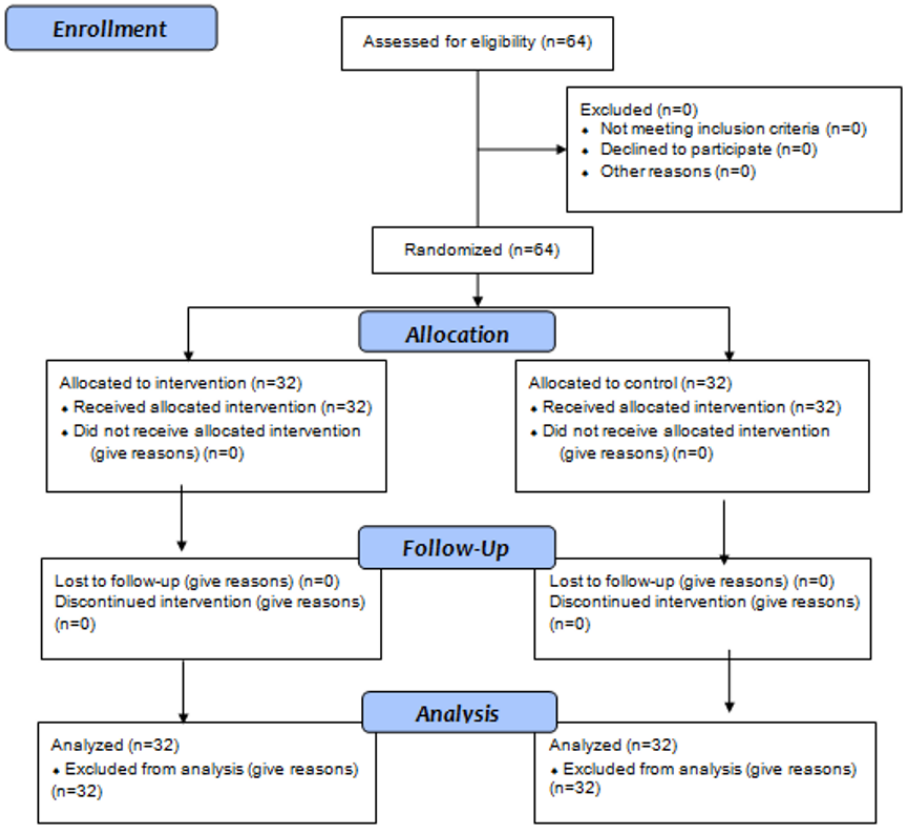

Figure 2. Consort flow diagram (2020).

Statistical Analysis

Statistical analysis was performed using SPSS, version 22 (IBM Inc.,Armonk, NY,USA). The conformity test for normal distribution was evaluated with the Shapiro-Wilks Test. Scores were analyzed using descriptive statistics, including mean± standard deviation (SD) and median and interquartile range (IQR). Repeated measures were analyzed using nonparametric tests for repeated measures data in factorial designs (F1-LD-F1 design) for continuous data that were not normally distributed. When the interaction was significant, the groups were evaluated independently. The Mann-Whitney U test was utilized to compare two independent groups. The critical significance level was at The Mann-Whitney U test was utilized two independent groups. The critical significance level was set at $p<0.05$, and the result of pairwise comparisons for post hoc tests were presented with adjusted *p*-values.

Results

No complications to the interventions were reported in mothers or the fetuses. No problems were encountered during the data collection process.

Cronbach's alpha internal consistency was 0;733. STAI-T internal consistency in this study was found as 0,811 before the intervention when dilation was 3-4 cm and 0;716 after the intervention; STAI-S internal consistency coefficient was 0;848 when dilation was 5-6 cm and 0;823 after the intervention; STAI-S internal consistency coefficient was 0;856 when dilation was 8-9 cm, and 0;801 after the intervention.

Sixty-four women took part, with a mean age of 22.08±2.73 years. The mean gestational week was 38.60±0.73. Of the participating women, 61(90.6%) wanted one of their relatives to be with them during labor.

This study found no differences between the groups in terms of their socio-demographic and obstetric features (Table 1). Moreover, The groups did not differ in terms of their STAI-T scores ($p>0.05$).

The women in the experimental group reported significant decreases in the VAS scores at D_1 , D_2, and D_3 (p=0.015; p<0.05) after the intervention in comparison to the values before the intervention. In contrast, the control group, reported significant increases in VAS scores at D_1 (p=0.001; p<0.001), D_2 (p=0.001; p<0.001), and D_3 (p=0.001; p<0.001) after the intervention compared to their scores before the intervention (Table 2, Figure 3).

Table 3 shows the STAI-S scores before and after the intervention within and between the groups. A significant lower mean STAI-S score was found in the experimental compared to the control groups at dilatation D_1, D_2, and D_3 after the intervention (p<0.05), (see Table 3 and Figure 4).

Table 1. Socio-demographic and obstetric characteristics of the participating women.

Characteristics of the participants		Experimental (n=32) n (%)	Control (n=32) n (%)	Total (n=64) n (%)	*p*
Age	**21 years old and under**	14 (43.8)	17 (53.1)	31 (48.4)	0.617
	22 years old and older	18 (56.3)	15 (46.9)	33 (51.6)	
Education level	**Primary school and under**	15 (46.9)	21 (65.6)	36 (56.3)	0.208
	Secondary school and older	17 (53.1)	11 (34.4)	28 (43.8)	
Income perception	**Good**	14 (43.8)	14 (43.8)	28 (43.8)	1.000
	Middle	10 (31.3)	10 (31.3)	20 (31.2)	
	Low	8 (25.0)	8 (25.0)	16 (25.0)	
Living place	**Province**	17 (53.1)	14 (43.8)	31 (48.4)	0.119
	District	9 (28.1)	16 (50.0)	25 (39.1)	
	Village	6 (18.8)	2 (6.3)	8 (12.5)	
Gestational week	**37 and week under**	14 (43.8)	21 (65.6)	35 (54.7)	0.132
	38 week and older	18 (56.3)	11 (34,4)	29 (5.3)	
Perception of labor	**Positive**	22 (68.8)	26 (81.3)	48 (75.0)	0.386
	Negative	10 (31.3)	6 (188).	16 (25.0)	
Feeling ready for normal labor	**Yes**	21 (65.6)	27 (84.4)	48 (75.0)	0.197
	No	6 (18.8)	2 (6.3)	8 (12.5)	
	Partially	5 (15.6)	3 (9.4)	8 (12.5)	
Anxiety about labor	**Yes**	20 (62.5)	24 (75)	44 (68,8)	0.418
	No	12 (37.5)	8 (25.0)	20 (31.3)	
Normal labor decision	**Doctor**	3 (9.4)	2 (6.3)	5 (7.8)	0.285
	Woman	21 (65.6)	16 (50.0)	37 (57.8)	
	Partner	8 (25.0)	14 (43.8)	22 (34.4)	
Number of patients in the labor room	**3 person and under**	13 (40.6)	16 (50.0)	29 (45.3)	0.616
	4 persons	19 (59.4)	16 (50.0)	35 (54.7)	

$\chi 2$: Chi-Square Test, Continuity (Yates) Correction and Fisher Full Chi-Square Test, p<0.05 Significance level.

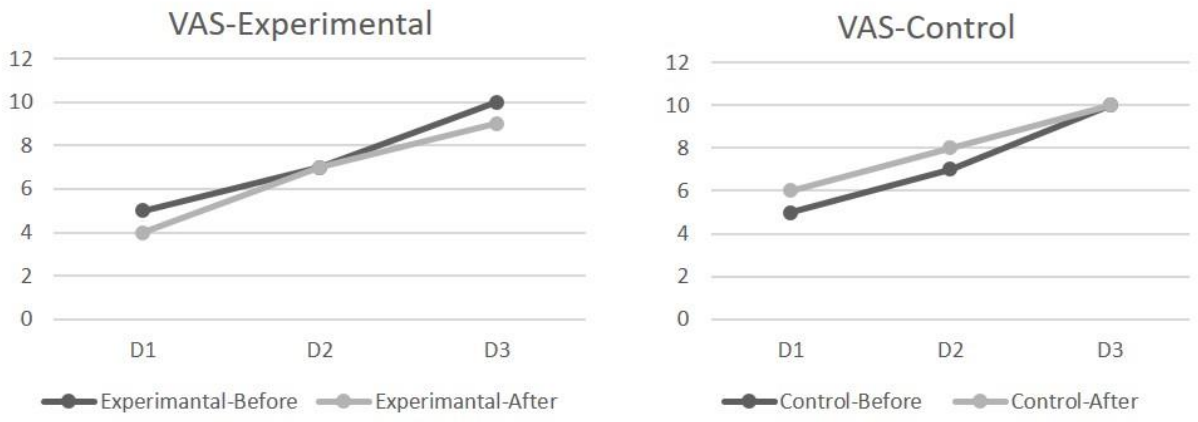

Figure 3. Visual analog scale scores of women before and after intervention.

Table 2. Visual analog scale scores of the women before and after intervention.

VAS	Experimental			Control			Between Groups	Test Statistics; *p* values
	X̄±SD	X̃ (Min-Max)	Within Groups	X̄±SD	X̃ (Min-Max)	Within Groups		
D_1-Before	4.97±0.74	5 (4-6)		4.75±0.72	5 (4-6)		U=429.5 *p*=0.232	Group: WTS=1.279 *p*=0.262
D_2-Before	7.38±0.66	7 (8-8)	FT=63.512 *p*<0.001	7.38±0.66	7 (6-8)	FT=63.512 <0.001	U=95.0 *p*<0.001	Factor: WTS=2693.9 *p*<0.001
D_3-Before	9.88±0.34	10 (9-10)		9.81±0.4	10 (9-10)		U=512.0 *p*=1.000	Group x Factor: WTS=0.662 *p*=0.419
D_1-After	4.09±0.73	4 (3-5)		5.5±0.62	6 (4-6)		U=181.5 *p*<0.001	Group: WTS=110.3 *p*<0.001
D_2-After	6.91±0.82	7 (6-8)	FT=64.000 *p*<0.001	7.97±0.59	8 (7-9)	FT=64.000 <0.001	U=480.0 *p*=0.495	Factor: WTS=1947.5 *p*<0.001
D_3-After	9.31±0.64	9 (8-10)		9.91±0.3	10 (9-10)		U=251.5 *p*<0.001	Group x Factor: WTS=13.878 *p*<0.001
D_1-Before	4.97±0.74	5 (4-6)	Z=-4.644 *p*=0.001	4.75±072	5 (4-6)	Z=-3.692 *p*=0.001	U=429.5 *p*=0.232	Group: WTS=4116.7 *p*<0.001
D_1-After	4.09±0.73	4 (3-5)		5.5±0.62	6 (4-6)		U=181.5 *p*<0.001	Factor: WTS=0.463 *p*=0.499
								Group x Factor: WTS=78.194 *p*<0.001
D_2-Before	7.38±0.66	7 (6-8)	Z=-2.434 *p*=0.015	7.38±0.66	7 (6-8)	Z=-3.624 *p*=0.001	U=95.0 *p*<0.001	Group: WTS=15.575 *p*<0.001
D_2-After	6.91±0.82	7 (6-8)		7.97±0.59	8 (7-9)		U=480.0 *p*=0.495	Factor: WTS=0.312 *p*=0.578
								Group x Factor: WTS=22.538 *p*<0.001
D_3-Before	9.88±0.34	10 (9-10)	Z=-3.819 *p*=0.001	9.81±0.4	10 (9-10)	Z=-1732 *p*=0.083	U=512.0 *p*=1.000	Group: WTS=8.396 *p*=0.005
D_3-After	9.31±0.64	9 (8-10)		9.91±0.3	10 (9-10)		U=251.5 *p*<0.001	Factor: WTS=14.936 *p*<0.001
								Group x Factor: WTS=29.274 *p*<0.001

X̄: Mean, X̃: Median, SD: Standard deviation, Min: Minimum, Max: Maximum, U: Mann-Whitney U test, Z: Wilcoxon test, WTS: Wald type statistics.
D: Dilatation, D_1 (3-4 cm), D_2 (5-6 cm) and D_3 (8-9 cm).

Table 3. The participating women's state anxiety inventory scores before and after the intervention.

STAI-S	Experimental			Control			Between Groups	Test Statistics; *p* values
	X̄±SD	X̃ (Min-Max)	Within groups	X̄±SD	X̃ (Min-Max)	Within groups		
D_1-before	45.25±3.91	46 (37-50)		44.88±4.06	45 (36-52)		U=478,5 *p*=0.652	Group: WTS=11.60 *p*<0.001
D_2-before	48.13±3.03	49 (37-52)	FT=9.673 *p*=0.008	51.78±2.21	52 (46-57)	FT=39.190 *p*<0.001	U=144,0 *p*<0.001	Factor: WTS=27.63 *p*<0.001
D_3-before	47.25±1.27	47 (44-49)		48.38±1.7	48 (46-54)		U=332,5 *p*=0.013	Group x Factor: WTS=2.06 *p*=0.157
D_1-after	44.09±1.28	44 (41-46)		52.5±3.33	53 (45-59)		U=10,5 *p*<0.001	Group: WTS=490.97 *p*<0.001
D_2-after	47.09±0.82	47 (46-49)	FT=43.569 *p*<0.001	52.06±1.54	52 (50-55)	FT=36.111 *p*<0.001	U=0,0 *p*<0.001	Factor: WTS=17.26 *p*<0.001
D_3-after	45.22±2.14	45 (36-48)		48.03±1.2	48 (45-51)		U=93.0 *p*<0.001	Group x Factor: WTS=48.24 *p*<0.001
D_1-before	45.25±3.91	46 (37-50)	Z=-1.528 *p*=0.127	44.88±4.06	45 (36-52)	Z=-4.775 *p*<0.001	U=478,5 *p*=0,652	Group: WTS=43.45 *p*<0.001
D_1-after	44.09±1.28	44 (41-46)		52.5±3.33	53 (45-59)		U=10.5 *p*<0,001	Factor: WTS=32.24 *p*<0.001
								Group x Factor: WTS=59.40 *p*<0.001
D_2-before	48.13±3.03	49 (37-52)	Z=-2.269 *p*=0.023	51.78±2.21	52 (46-57)	Z=-0.374 *p*=0.709	U=144.0 *p*<0.001	Group: WTS=189.40 *p*<0.001
D_2-after	47.09±0.82	47 (46-49)		52.06±1.54	52 (50-55)		U=0 *p*<0.001	Factor: WTS=0.829 *p*=0.366
								Group x Factor: WTS=2.54 *p*=0.116
D_3-before	47.25±1.27	47 (44-49)	Z=-4.380 *p*<0.001	48.38±1.7	48 (46-54)	Z=-1.322 *p*=0.186	U=332.5 *p*=0.013	Group: WTS=31.153 *p*<0.001
D_3-after	45.22±2.14	45 (36-48)		48.03±1.2	48 (45-51)		U=93.0 *p*<0.001	Factor: WTS=35.37 *p*<0.001
								Group x Factor: WTS=17.86 *p*<0.001

X̄: Mean, X̃: Median, SD: Standard deviation, Min: Minimum, Max: Maximum, U: Mann-Whitney U test, Z: Wilcoxon test, WTS: Wald type statistics.
D: Dilatation, D_1 (3-4 cm), D_2 (5-6 cm) and D_3 (8-9 cm).

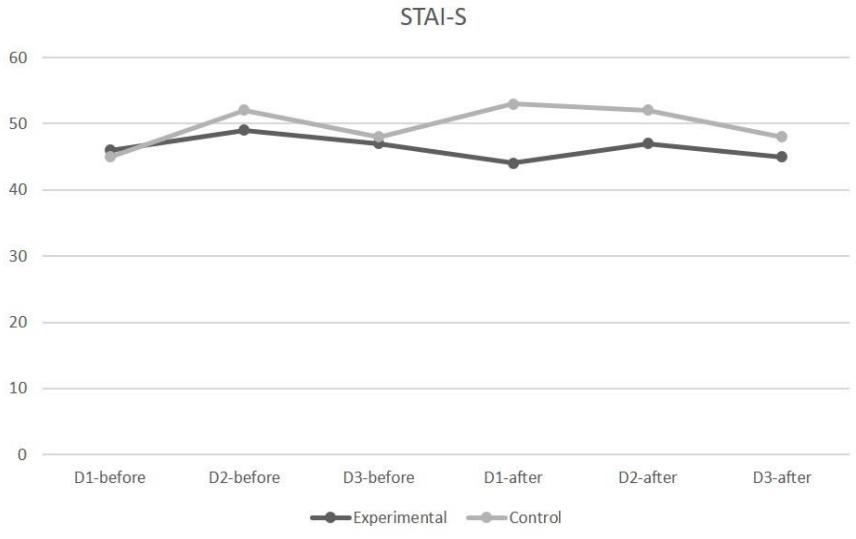

Figure 4. State anxiety inventory scores before and after intervention of women

Table 4. The participating women's duration of labor and its progress according to groups.

Labor Process	Experimental		Control		Between Groups	Test Statistics; *p* values
	X̄±SD	X̃ (Min-Max)	X̄±SD	X̃ (Min-Max)		
Duration of Labor (hour)	6.28±1.39	6.5 (8.32-2.40)	7.92±1.06	7.96 (9.48-5.53)	U=-4.452 *p*=0.001	NA
Cervix						
1st hour	4.63±0.79	4 (4-7)	4.22±0.42	4 (4-5)	U=-2.287 *p*=0.022	
2nd hour	5.53±1.19	5 (4-10)	4.81±0.64	5 (4-6)	U=-2.8182 *p*=0.005	
3rd hour	6.55±1.46	6 (5-10)	5.47±0.67	5 (5-7)	U=-3.374 *p*=0.001	Group: WTS=9,978 *p*=0.003
4th hour	7.67±1.35	7 (5-10)	6.41±0.71	6 (5-8)	U=-4.113 *p*=0.001	Factor: WTS=750,8 *p*<0.001
5th hour	8.58±0.99	8 (7-10)	7.44±0.84	7 (6-9)	U=-4.039 *p*=0.001	Group x Factor: WTS=5,220 *p*<0.001
6th hour	9.43±0.75	10 (8-10)	8.44±0.98	8 (7-10)	U=-3.484 *p*=0.001	
7th hour	9.92±0.29	10 (9-10)	9.19±0.75	9 (8-10)	U=-3.006 *p*=0.003	
Contraction						
1st hour	1.25±0.51	1 (1-3)	1.16±0.37	1 (1-2)	U=-0.684 *p*=0.494	
2nd hour	1.81±0.74	2 (1-3)	1.47±0.51	1 (1-2)	U=-1.861 *p*=0.006	
3rd hour	2.23±0.62	2 (1-3)	1.78±0.55	2 (1-3)	U=-2.835 *p*=0.005	Group: WTS=1.928 *p*=0.100
4th hour	2.57±0.57	3 (1-3)	2.19±0.54	2 (1-3)	U=-2.687 *p*=0.007	Factor: WTS=1085.5 *p*<0.001
5th hour	2,.8±0.33	3 (2-3)	2.63±0.49	3 (2-3)	U=-2.226 *p*=0.026	Group x Factor: WTS=15.644 *p*<0.001

X̄: Mean, X̃: Median, SD: Standard deviation, Min: Minimum, Max: Maximum, U: Mann-Whitney U test, Z: Wilcoxon test, WTS: Wald type statistics, NA: Not-applicable.

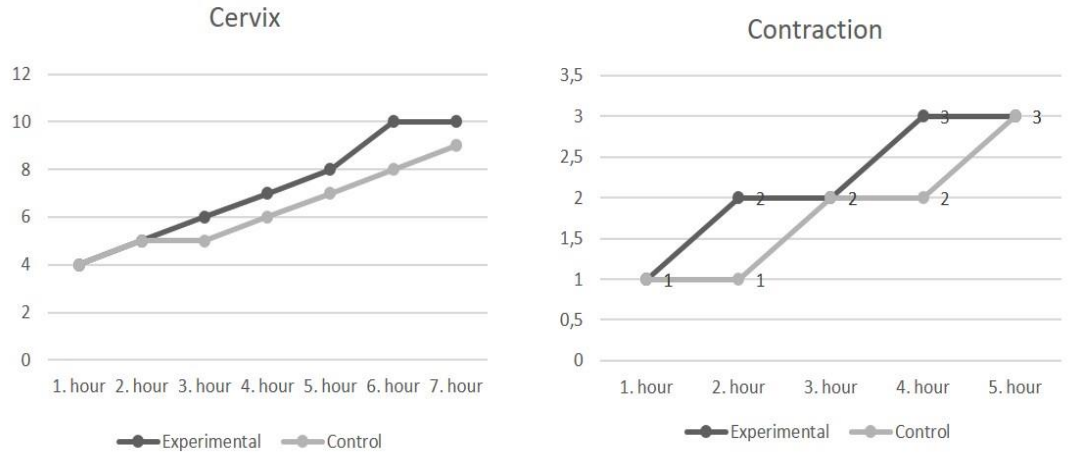

Figure 5. The participating women's duration of labor and its progress according to groups.

Table 4 illustrates findings regarding progress of labor and the duration of labor. The total labor duration of the women in the experimental group was significantly shorter in comparison to the control group (p=0.001; p<0.01), (Table 4, Figure 5).

As the distribution of the data decreased after the seventh hour of labor, the analyses included the data up to seven hours. As it was not possible to measure each woman's data every hour, the analyses included the common measurements. No significant differences were found between the experimental and control groups in terms of vital signs (p>0.05) and all the participating women (n=64) perceived their health as good. None of the participating women had any complications within the duration period between going to the delivery room and going to the postnatal care room (approximately 45 minutes). The mean satisfaction level of the women in the experimental group was 9.91±0.30 and all expressed a desire to have the same intervention in subsequent labors.

There were no differences between the groups in terms of FHR or neonatal APGAR scores (p>0.05).

Discussion

This aim of this study was to investigate the effect of effleurage massage on self-reported labor pain and anxiety levels and the labor process itself. The results showed that the intervention yielded significantly lower pain and anxiety scores in the experimental group. Earlier studies have investigated the effects of massage therapy on labor pain;[5,6,29,32,38-41] but the type of massage, application areas, massage duration, and group characteristics in these studies were different from the present study.

In this study, it was determined that there was no statistically significant difference between the VAS scores before the application between the experimental and control groups (p>0.05), while the pain scores of the control group after the application were statistically significantly higher than the pain scores in the experimental group. As a result of the study, massage application with the effleurage massage technique to the sacrum, hips, shoulders, waist, hands and feet reduced the labor pains of women. Like the study conducted, Gönenç and Terzioğlu[6] conducted a study to determine the effects of massage and acupressure on the labor process. These authors applied massage and acupressure to the women in the experimental group. There was a significant decrease in the perceived pain scores of the women after the application.[6] Unlike this study, massage application points varied, while acupressure application was also performed. Ali and Ahmed conducted a study to evaluate the effects of position changes and back massage on the intensity of labor pain. They found that back massage administered during the first stage of labor reduced pain perception more effectively than changing positions.[29] Türkmen[30] investigated the effects of sacral massage and hot compress on labor pain and comfort level with a randomized controlled trial and applied effleurage and friction massage to the sacral region in D1, D2 and D3 for 10 minutes while pregnant women were sitting or lying on their left side. It was found that massage application reduced the perception of labor pain at 6-7 cm cervical dilatation. According to the study results, the pain average of the hot application group was found to be lower than the massage and control groups. The pain intensity of the massage group was also found to be statistically significantly lower than the control group.[30] Unlike this study, a different massage technique was used for a shorter time on a single region and hot compress application was also performed.

In the management of labor pain, other non-pharmacological methods are also used in addition to effleurage massage techniques. When other studies using nonpharmacological methods were evaluated, Sedat and Forugh[31] investigated the effect of manual massage applied to the hand during the first stage of labor on the intensity and duration of pain in primigravida pregnant women. While the experimental group received 15 min. of manual hand massage, the other group received standard care. It was observed that the pain intensity was significantly lower in the women who received manual massage compared to the other group.[31] The effect of skin therapy methods applied to the lumbar region of pregnant women conducted by İpek[5] was investigated. In the study, continuous 30-minute massages were applied to the massage group during the active and transitional stages of labor. Pain levels were assessed using VAS. It was found that massage reduced pain perception during the active and transitional stages of labor.[5] Unlike this study, it was applied only to the lumbar region and massage was applied only during the active and transitional stages. Ranjbaran et al. conducted a meta-analysis to evaluate the effects of massage therapy on labor pain relief. They found that massage therapy was generally effective in reducing labor pain and recommended its use for primiparous women[41] Analysis of these studies measuring the effects of massage on labor pain showed that the results were similar to the results in the current study and that massage was effective in reducing labor pain. Some other findings in the literature similar to the findings of the current study[32,38,40-42] reported the positive effect of massage in reducing labor pain.

In this study, when the dilation was 3-4, 5-6 and 8-9 cm in the experimental and control groups, a statistically significant difference was found between the mean anxiety scale scores of the pregnant women after the application compared to before the application (p<0.05). It was found that the anxiety levels of the women in the experimental group decreased significantly compared to the control group after the interventions. Although this study showed differences in terms of the type of massage, massage areas, massage durations and group characteristics; there are randomized controlled studies in the literature investigating the effects of massage on anxiety during labor.[4,32] These studies also support our study. Gönenç and Terzioğlu[6] found that massage significantly reduced anxiety levels in pregnant women before and after the application.[6] Mortazavi and Khaki[32] aimed to determine the effects of massage on pain, anxiety and satisfaction during labor in their studies with primiparous pregnant women. They found that anxiety in the latent phase was significantly lower in the massage group compared to the other groups.[32] Chang et al.[4] They evaluated the effects of massage on pain and anxiety levels during labor and found that anxiety levels in the latent phase were significantly different between the two groups.[4] The findings of this study are consistent with other studies in the relevant literature indicating that massage leads to a decrease in anxiety levels during labor.[4,6,32] According to the results we obtained from this study; Effleurage massage has been shown to help reduce anxiety during labor. The findings in the literature support the positive results from our study.

In this study; the total labor durations were examined, and the labor durations of women in the experimental group were found to be significantly lower than those of participants in the control group (p=0.001; p<0.01). The average labor duration in the experimental group was 6.5 hrs, while it was 7.96 hrs in the control group. Similar to this study, Bolbol-Haghighi et al.[1] investigated the effects of massage therapy on labor duration in a study conducted with primiparous pregnant women. While the pregnant women in the experimental group were given massages for at least 30 min. on their lower abdomen, upper thighs, sacral regions, shoulders and legs; routine care was given to the women in the control group. It was found that the duration of the first and second stages of labor was shorter in the experimental group than in the control group.[1] İpek[5] also reported that the active phase duration in the massage group was significantly shorter than in the other groups.[5] Hosseini et al.[43] investigated the effects of massage given to nulliparous pregnant women on the labor process in their experimental study; the experimental group was given massages from the shoulder to the elbow, lumbar region and sacral region. Massage therapy significantly impacts labor duration and progression.[43] Mortazavi and Khaki[32] also reported that massage has positive effects in reducing the duration of labor.[32] These studies investigating the effect of massage on the duration of labor are similar to the results of this study. On the other hand, unlike this study, a number of studies have reported that massage has no significant effect on labor duration or

prolongs labor duration.[6,31,38,39] In the study conducted by Gönenç and Terzioğlu[6], the total labor duration of the control group in terms of the first stage of labor was found to be significantly different from the experimental group, while the duration of the second stage of labor did not show a statistically significant difference between the groups.[6] In a randomized controlled study conducted by Gallo and Santano[39] to understand the effect of massage on labor pain in 46 pregnant women, the mean labor duration of the experimental group was 6.8 hours and the control group was 5.7 hrs, with an average difference of 1.1 hrs, and the mean labor duration of the experimental group was found to be higher than the control group.[39]

In this study, when we evaluated the cervical dilatation and contraction intensity at different times in the experimental and control groups, a statistically significant difference was found in the experimental groups compared to the control groups (p<0.05). The progress of labor in the experimental group was more positive compared to the control group, the progress of dilatation was faster, and the intensity of contractions was higher. It was found that the labor process was more positive, cervical dilatation occurred faster, and the intensity of contractions was higher in the women in the experimental group compared to the control group. Similar to this study, Gönenç and Terzioğlu[6] reported that the rate of completing the cervical dilatation process in the massage group was higher than in the other groups; however, there was no significant difference between the groups.[6] Unlike this study, Türkmen[30] reported that the massage given to pregnant women had no effect on the effacement and dilatation rates in the active and transitional phases.[30]

In this study, it was found that the vital signs of pregnant women in the experimental and control groups were within the normal range. Türkmen[30] also found that massage given to pregnant women did not have a negative effect on the vital signs of pregnant women, which is consistent with the findings of the current study.[30]

When the effect of massage application on the fetus was evaluated in this study, it was seen that it did not affect the heart rates of the fetus according to the groups in terms of heart rates at the 1st, 2nd, 3rd, 4th, 5th, 6th and 7th hrs. It was also seen that it did not affect the APGAR scores of the newborn at the end of birth. These results also show that massage did not negatively affect either the fetus at birth or the newborn in the postpartum period. Similarly, all of the women (n=64) stated that they perceived their health as good, and no complications were observed in all of the women during the postpartum period from the delivery room to the postpartum care clinic (within an average of 45 min.). It also shows that massage did not cause any negative complications in the mother in postpartum period.

In this study, the massage satisfaction levels of the women in the experimental group ranged from 9 to 10, with a mean of 9.91±0.30 and a median of 10. All of the pregnant women in the current study (n=32, 100%) were found to be satisfied with the massage given to them and wanted to have a massage during their next birth. Similar to the current study, studies investigating satisfaction with massage in pregnant women found that the reported satisfaction rates supported the findings in our study.[6,31,32,44,45]

Conclusion

The results of this study demonstrated that effleurage massage applied to the sacrum, hips, waistline, hands, and feet during labor effectively decreased reported anxiety levels, reduced the severity of the labor pain, shortened the duration of labor, and increased overall satisfaction with the labor experience. This suggests that effleurage massage may be beneficial for primigravid women undergoing labor. However, randomized controlled trials with long-term follow-up and a more heterogeneous population are needed to confirm the validity of our findings.

Conflict of Interest

The authors have no conflicts of interest to declare.

Compliance of Ethical Statement

The Ethics committee approval was obtained from the Cukurova University Medical Faculty Non-invasive Clinical Research Ethics Committee (13th of January 2017 with a 60/12 decision number). Official permission was obtained from the hospital where the study was conducted, and informed consent was received from the participants.

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Author Contributions

All authors contributed equally to the article's concept, writing and editing of this article.

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