



## The Effect of Head-Neck and Hand Massage on Spinal Headache After Cesarean Section: Randomized Clinical Trial

Alehe Seyyed Rasooli<sup>1</sup>, Simin Atashkhoei<sup>2</sup>, Akram Ghahramanian<sup>3</sup>,  
Sakine Goljaryan<sup>4</sup>, Leila Zarie<sup>5\*</sup>

<sup>1</sup>Department of Medical-Surgical Nursing, Faculty of Nursing and Midwifery, Tabriz University of Medical Sciences, Tabriz, Iran

<sup>2</sup>Professor of Anesthesiology Al-Zahra Hospital, Tabriz University of Medical Sciences.

<sup>3</sup>Hematology and Oncology Research Center, Medical Surgical Department, Nursing and Midwifery Faculty, Tabriz University of Medical Sciences, Tabriz, Iran

<sup>4</sup>Rehabilitation Faculty, Tabriz University of Medical Sciences

<sup>5</sup>Department of Medical-Surgical Nursing, Faculty of Nursing and Midwifery, Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran

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### ABSTRACT

Caesarean section has been introduced as a method protecting the life of method for and infant and Spinal anesthesia is the most common anesthetic technique used in cesarean section. The rate of headache after spinal anesthesia has been reported from 0.1% to 36% in several studies. Headaches caused after spinal anesthesia are stressful for mothers and prevent desired caring of mothers from infant and lactation. Hence, the current research was conducted to evaluate the impact of head-neck and hand massage on headache severity after spinal anesthesia in women underwent cesarean delivery. The present study is a randomized controlled clinical trial in which 60 patients undergoing cesarean section referring to Tabriz Azad University of Medical Sciences were randomly divided into two intervention groups (massage group on face-neck pressure and massage group. On the pressure points of the hands) and the control group. In the first and second group, massage was performed 3 times a day for 15 minutes over 2 consecutive days on compression points of the head and neck. the following tools were used to collect the data demographic questionnaire and Visual Analogue Scale (VAS). To analyze the data, in addition to descriptive statistics, Repeated Measures ANOVA was used to compare the duplicate data (mean pain severity) in each of the groups and ANOVA test was used to compare the mean pain severity among three groups (inter-group comparisons). Data were analyzed using SPSS 22 software at a significance level of 0.05. The results of this study shows that mean headache severity in the control group was higher than that in the head- neck massage group and the hand massage group, and comparison of intervention groups showed that head-neck massage group had significantly lower headache severity compared to hand massage group and control group. Conclusion: findings of this research suggest that massage therapy affects the severity of headache caused by spinal anesthesia in patients underwent cesarean section surgery.

**Key words:** Head-Neck, Hand Massage, Spinal, Headache, Cesarean

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**Corresponding author:** Leila Zarie

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### INTRODUCTION

Caesarean section has been introduced as a method protecting the life of method for and

infant (1). The rate of cesarean section in Iran has increased by 40 to 60 percent, which is three times greater than global standards. However, cesarean section should be 5 to 15 percent based on WHO(2) . Spinal anesthesia is the most common anesthetic technique used in cesarean section, since it reduces the rate of intubation, bleeding,

maternal pulmonary aspiration, and fetal distress. It also results in decreased mortality rate by one sixteenth and it is considered as a low-risk method(3, 4) . However, it is associated with several side effects, including post-dural-puncture headache (PDPH), which leaves significant impact on post-operative well-being of patients (5) . The rate of headache after spinal anesthesia has been reported from 0.1% to 36% in several studies(6). Some studies have reported it in one third of patients(4). In a research conducted by Pirbudack (2014), the rate headache after spinal anesthesia was reported 40%(7). Conservative measures are considered as the first therapeutic measures for this type of headache (7). To prevent and treat this types of headaches, physicians usually use non-opioid analgesics, non-steroidal anti-inflammatory drugs, benzodiazepines, or opioids, while none of these methods has been completely effective so far. Most of drug treatments are associated with side effects and nurses cannot use them without physician prescription(5, 8, 9). Headaches caused after spinal anesthesia are stressful for mothers and prevent desired caring of mothers from infant and lactation (10) .

Inadequacy of analgesics to relieve pain is one of the factors made nursing systems pay more attention to complementary treatments and non-drug methods to relieve the pain(11). Nurses can use independent measures, including non-drug methods to relive the pain. One of the non-drug and non-invasive nursing interventions is massage therapy (9). Reducing the level of stressful hormones such as cortisol, epinephrine and norepinephrine, and thus reducing the anxiety, massage is effective in patients' relaxation. It improves the quality of life of patients through decreasing the physical and psychological symptoms (12). A systematic research conducted by Young-Ren Yun (2016) and Cheng and Hang (2013) on the impact of massage therapy emphasized on conducting studies, especially the randomized controlled trial type of study, with larger sample size and with long-term follow-up(12). Hence, the current research was conducted to evaluate the impact of head-neck and hand massage on headache severity after spinal anesthesia in women underwent cesarean delivery.

## MATERIALS AND METHODS

The current research is a randomized controlled clinical trial. Sampling was started after obtaining permission from the Ethics Committee and

recording the study on the IRCT site. The research environment included the wards of cesarean section 1 and 2 in Al-Zahra Medical Center in Tabriz, northwest of Iran, accounting for the highest rate of delivery. By referring to the selected center and examining the inclusion criteria of study and stating the research objectives, written informed consent was obtained from patients. The inclusion criteria of study included women aged between 18 and 40 years, who underwent cesarean section using spinal anesthesia, the same anesthesiologist, lack of visual impairment, and having the reading/writing literacy. Exclusion criteria of study included having a history of headache (migraine, sinusitis, meningitis), suffering from preeclampsia, patients with a history of underlying diseases (having hypertension and neuromuscular diseases), brain tumors, post-dural-puncture headache more than once, history of previous spinal anesthesia, and  $30 > \text{BMI} < 20$ . In this research, the following tools were used to collect the data:

1-Female social-individual demographic questionnaire, including age, marital status, educational level, economic status, job, number of pregnancies, and number of children

-Visual Analogue Scale (VAS): it was used to determine the headache severity. It includes a line with 10 cm in length, which one side of it is written without pain, and the other side of it is written severe pain. The precision and accuracy of VAS has been confirmed in the study conducted by Mohseni et al (2012). To ensure the reliability of the scale, intraclass correlation coefficients were used. Accordingly, the scale was marked by 10 patients with headache in the first turn. One minute later, patients were asked to re-mark the severity of their headache in VAS. The interval of one minute was selected since pain severity does not change significantly during this time. After entering 10 pairs of headache score in SPSS, intraclass correlation coefficient was calculated. Due to lack of similar study, a pilot study with sample size of 5 people was performed in each group. After pilot study and given 95% confidence level the test power of 80%, sample size was determined to be 20 people for each group using G-Power software. In the next stage, random blocks with volume 3 and allocation ratio of 1: 1: 1 were used and subjects were assigned into two groups of intervention (massage therapy group on the pressure points of face and neck, massage therapy group on the pressure points of hands) and control group.

Random numbers related to this method were produced using Random Allocation Software. To avoid the bias, the random allocation of subjects to the study groups was hidden and this process was remained hidden until interventions. In order to hide the allocation process, consecutive dark and numbered pockets were used. In the first group, headache severity was recorded in the data recording sheet by researcher before the start of intervention by using the VAS scale. Then, the massage was used 3 times per day for 15 minutes during 2 consecutive days on the pressure points of head and neck (Masseter, Trapezius Sternomastoid, and Temporalis) in patients hospitalized in cesarean ward 1.

In the second group, headache severity was recorded in the data recording sheet by researcher before the start of intervention by using the VAS scale. Then, the massage was used 3 times per day for 15 minutes at hours of 11.30, 16.30, and 20.30 on the pressure points of hands (Zhong Zhu, Yang Chi, Thai Ling, Shen Men) in patients hospitalized in cesarean ward 2. Massage was applied for both groups on the patient bed by researcher who had been trained in massage therapy classes for one week, with a relaxed rhythm and a pressure at the tolerance threshold of patient in the form of index and middle fingers in clockwise direction on pressure points. At the end of massage, each of the mentioned pressure points was pressed for one minute steadily by fingers. Then, headache severity was recorded in the data recording sheet by help of researcher and using VAS scale after each intervention.

Massage was started with or without headache in both of the groups and severity of headache during the first 24 hours and 48 hours after cesarean section was recorded in the checklists and because of patients' discharge after 48 hours, in order to know the headache severity after discharge during the first week after the cesarean section, patients completed the checklist.

It should be noted that in a phone call by client for 5 days, they provided required trainings on completion of the checklists for patients. Control group patients were selected among those patients hospitalized in cesarean section wards 1 and 2 and received only routine measures.

The time of asking question on severity of headache during the first 24 hours and 48 hours after cesarean section was simultaneous in two intervention groups, and because of patients' discharge after 48 hours, in order to know headache severity during the first week of cesarean delivery, patients completed the checklists, in which they recorded the beginning and end of the pain in the form. It should be noted again that in a phone call by client for 5 days between hours 9 to 10 (based on patient's request), they provided required trainings on completion of the checklists for patients. The time of interventions was planned in a way that they did not interfere with patient appointment, delivering the shifts, the implementation of the medication orders, and the visiting. Accordingly, the times of 11:30, 16:30 and 20:30 were considered. In addition, those mothers were selected who had attendance to take care of the newborn during the interventions, so that mother can have required cooperation with researcher during the intervention without any concern and stress on caring her infant.

To analyze the data, in addition to descriptive statistics (mean, standard deviation, confidence interval), Repeated Measures ANOVA was used to compare the duplicate data (mean pain severity) in each of the groups and ANOVA test was used to compare the mean pain severity among three groups (inter-group comparisons). Data were analyzed using SPSS 22 software at a significance level of 0.05.

FINDINGS

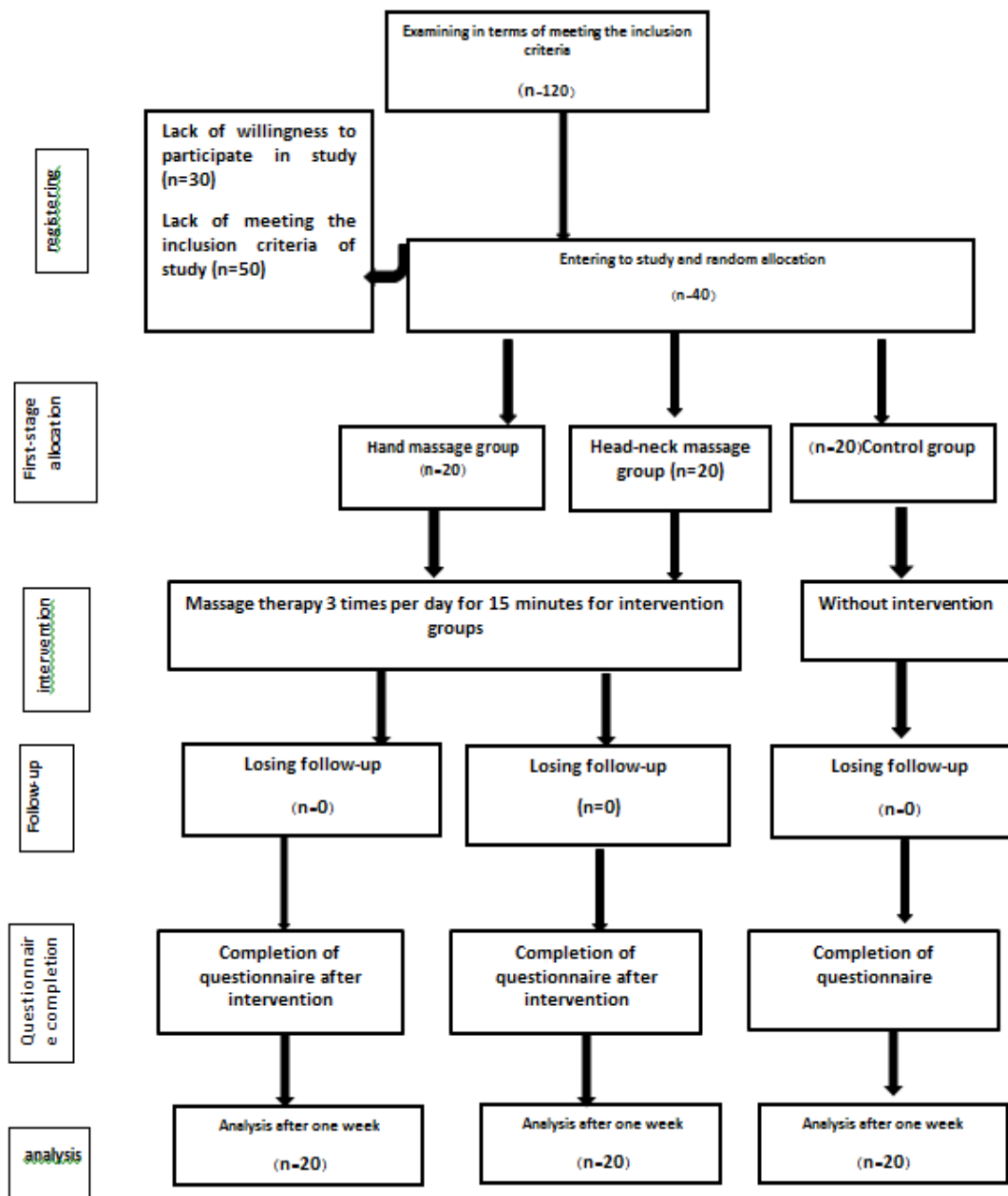


Diagram 1. flow diagram related to trial

Findings of Table 1 and 2 showed no significant differences among three groups in terms of quantitative and qualitative variables of social-individual characteristics of women ( $P > 0.05$ )

**Table 1. Comparison of qualitative demographic variables among patients separately in terms of groups**

		Group			P value
		Control	Head and neck	hand	
Educated level	Elementary	3 25%	4 33.3%	5 41.7%	0.891
	Guidance	4 36.4%	3 27.3%	4 36.4%	
	High school	8 30.8%	11 42.3%	7 26.9%	
	Academic	4 40%	2 20%	4 40%	
	Illiterate	1 100%	0 0%	0 0%	
	Income level	Income equals to expenditure	11 26.8%	16 39%	
	Income more than expenditure	2 66.7%	0 0%	1 33.3%	
	Income less than expenditure	7 43.8%	4 25%	5 31.3%	
Employment status	employed	1 33.3%	0 0%	2 66.7%	0.766
	housekeeper	19 33.3%	20 35.1%	18 31.6%	

**Table 2. Comparison of quantitative demographic variables of the patients studied in separate groups**

Underlying variable	group	mean	SD	95% confidence interval for mean		P value
				Upper limit	Lower limit	
Age (year)	Control	27.80	7	24.52	31.07	.879
	Head and neck	26.85	5.44	24.30	29.39	
	Hand	27.45	5.32	24.95	29.94	
Pregnancy	control	1.55	0.94	1.10	1.99	0.575
	Head and neck	1.35	0.67	1.03	1.66	
	Hand	1.30	0.73	0.95	1.64	
Children number	control	1.55	0.88	1.13	1.96	0.520
	Head and neck	1.50	0.68	1.17	1.82	
	Hand	1.30	0.57	1.03	1.56	
height (cm)	control	159.4	5.98	156.64	162.25	0.443
	Head and neck	159	6.60	155.90	162.09	
	Hand	161.50	7.03	158.20	164.79	
weight (kg)	control	75.62	9.58	71.13	80.11	0.672
	Head and neck	74.85	10.82	69.78	79.91	
	Hand	77.82	12.16	72.13	83.51	

**Table 3. Mean and SD of headache severity in the studied groups at different times of assessment (n = 20)**

time	Group	Mean	SD
Headache severity in the first day	Control	0.25	1.11
	Head and neck	1	1.65
	hand	0.70	2.17
Headache severity in the second day	Control	0.30	1.34
	Head and neck	1.20	2.33
	hand	0.65	2.05
Headache severity in the third day	Control	3.40	2.74
	Head and neck	0.40	1.27
	hand	1.70	2.81
Headache severity in the fourth day	Control	3.50	3.18
	Head and neck	0.25	1.11
	hand	1.50	2.58
Headache severity in the fifth day	Control	2.50	3.01
	Head and neck	0	0
	hand	0	0
Headache severity in the sixth day	Control	0.75	2.31
	Head and neck	0	0
	hand	0.40	1.78
Headache severity in the seventh day	Control	0.40	1.27
	Head and neck	0	0
	hand	0	0

**Table 4. Comparison of three groups in terms of the mean severity of headache during the study**

Group	Mean	SD	P value
Control	4.81	2.30	P< 0.001
Head and neck	0.65	1.63	
hand	2.69	3.13	

The above table illustrates that headache severity in the control group was increased from the first day to the third day, then, it was gradually reduced. Considering the hand massage group, findings revealed that headache severity was increased from the first day to the third day, then, it was

gradually reduced. Considering the head-neck massage group, headache severity was increased from first day to second day, then, it was gradually reduced and reached to zero at days 5, 6, and 7.

Findings of above table illustrate that there was a significant difference between the studied groups in terms of headache severity (p <0.001) and this

reduction was significant in the head -neck massage group.

Diagram 1 illustrates that the mean headache severity in the control group was higher than that in the head- neck massage group and the hand massage group, and comparison of intervention groups showed that head-neck massage group had significantly lower headache severity compared to hand massage group and control group.

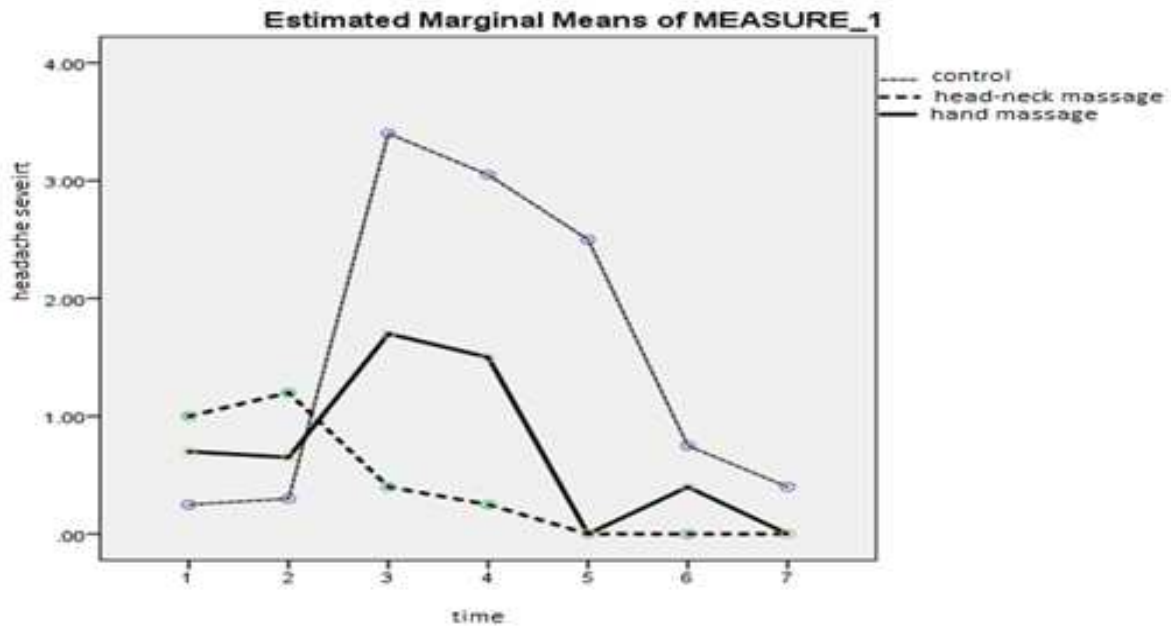


Diagram 1. Headache severity in the studied groups at different times

## DISCUSSION

The current research was carried out to compare the impact of massage therapy on headache severity caused by spinal anesthesia in women underwent cesarean delivery. In the current research, mean headache severity after spinal anesthesia was 4.81 in the control group, 2.69 in the hand massage group, and 0.65 in head-neck massage group. Findings of this research revealed significant difference among three groups in terms of severity of headache ( $p < 0.001$ ). The control group showed higher mean headache severity compared to head-neck massage and hand massage groups. In addition, comparison between intervention groups revealed that head-neck massage group had significantly lower headache severity compared to hand massage group ( $p < 0.001$ ) and the difference between them was significant. Findings of a randomized clinical trial carried out by Khachian et al (2016) under title of "comparing the impact of acupressure and touch on headaches caused by spinal anesthesia after cesarean section" on 90 women underwent spinal anesthesia revealed that both acupressure and touch were effective in the level of headache caused by spinal anesthesia in women underwent

cesarean section. However, the impact of acupressure was much higher. Thus, acupressure can be used along with other conventional treatments to control and treat these headaches (9). The research conducted by Elahi et al (2005) to investigate the impact of massage on the severity and frequencies of chronic tension headache on 25 women with tension headache revealed significant differences before, during, and after intervention, so massage therapy can reduce tension headaches (13). Findings of a clinical trial under title of impact of hand and leg massage on pain after cesarean section surgery by Latifi et al (2012) on three groups of hand-leg massage, leg massage, and control revealed that hand-leg massage reduced the pain after surgery significantly in first 24 hours after surgery. The pain severity in both intervention groups showed significant reduction compared to control (14). In a research carried out by Jahangiri et al (2012) in Iran on 10 male patients with migraine headache, intervention was applied in the form of massage and neck and spine manipulation. Findings of the research revealed that massage and neck manipulation reduced the headache severity significantly (15). The study conducted by Young-Ren Yen (2016) to examine the impact of massage therapy on shoulder pain in adults aged 18 years and older revealed that



massage therapy had a significant impact on decreasing the shoulder pain. Findings of this research are in line with findings of current study (16). In a research conducted by Quin et al to determine the impact of therapeutic massage on a non-malignant chronic headache on 10 patients, findings revealed that massage did not affect headache severity(17). This finding is inconsistent with finding of our study, which it might be due to small sample size of study.

**Limitation:** this research was conducted at Tabriz Educational-Therapeutic Center, so its findings cannot be generalized to other private centers.

**Recommendations:** it is recommended that similar studies to be conducted in different wards on women and men with different types of surgical procedures with spinal anesthesia.

**Conclusion:** findings of this research suggest that massage therapy affects the severity of headache caused by spinal anesthesia in patients underwent cesarean section surgery. In this method, not only the patients are not damaged, but also it can be performed everywhere due to its low cost. Therefore, it is better to use it as one of the non-drug therapies.

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