



The Effects of Massage Therapy by the Patient's Relative on Vital Signs of Males Admitted in Critical Care Unit

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ABSTRACT

Background: Changes in vital signs may affect the myocardial oxygen demand. Massage therapy has been used in intensive care units to relieve patients' physical and psychological problems. In all of the studies massaging has been done by a nurse and the patients' family did not have any role.

Objectives: The present study aimed to examine the effects of massage therapy by patient's relative on vital signs of patients with acute coronary syndrome and acute myocardial infarction.

Patients and Methods: A randomized controlled trial was conducted on 60 male patients hospitalized in coronary care units. In the intervention group, massage therapy was done by one of the patient's male relatives on the third day of admission. The control group only received the routine care. Vital signs were recorded before and after the massage therapy session. SPSS 11.5 software was employed to analyze data using chi-square, Fischer exact test, independent t-test, paired t-test and descriptive statistics.

Results: The pre intervention mean of systolic blood pressure of the intervention group were 126.36 ± 16.80 and changed to 121.70 ± 13.31 after the massage therapy session ($P = 0.021$). The mean pulse rate of the intervention group was 79.46 ± 10.41 and reached 69.30 ± 9.47 after the intervention ($P = 0.001$). The mean respiration rate of the intervention group also decreased after massage ($P = 0.001$). No significant changes were observed in diastolic blood pressure and temperature of the intervention group. No significant changes were observed in vital signs of the control group either.

Conclusions: Massage therapy by the patients' relative, decreased systolic blood pressure, pulse and respiration rates of patients admitted in critical care Unit (CCU). Because of the useful effects of those changes, it can be recommended that massage therapy by a member of the patient's family be used to balance vital signs of patients admitted in CCU. This study was registered at Iranian Registry of Clinical Trials (IRCT). The registration number of the study is IRCT201112048296N1.

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► Implication for health policy/practice/research/medical education:

Massage therapy by the patient's relative can stabilize the vital signs of patients admitted in CCU. Nurses and the hospital authorities are recommended to involve the patients' family members in the process of massage therapy and balancing the patients' vital signs.

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1. Background

Cardiac diseases, pain, anxiety, and fear can cause hemodynamic instabilities such as increase of pulse rate, blood pressure, and breathing rate (1). Anxiety, tachycardia and hypertension in patients suffering from acute coronary syndrome (ACS) and acute myocardial infarction (AMI) may increase the work of the heart and fatality of the disease (2, 3). Vital signs are sensitive toward pain and are affected by nervous system function (4). Unrelieved acute pain also affects cardiovascular, pulmonary, and endocrine systems and stimulates sympathetic nerves and as a result causes increase in blood pressure, pulse rate, and the respiration rate and depth (5). Rymaszewska *et al.* have reported that patients admitted in intensive care units and those who have undergone cardiac surgery, have been very anxious before and after the operation (6). This anxiety causes irritability and agitation, increased basal metabolic rate, catecholamine release, and changes in vital signs such as hypertension and tachycardia that consequently increase the myocardial oxygen demand (7). In recent years, alternative and complementary therapies such as music therapy, relaxation, guided imagery, reflexology, herbal medicine, hypnosis, therapeutic touch, and therapeutic massage have been used to decrease the mentioned side effects (8). "Massage therapy" is one of the oldest care methods (9) and of the most common complementary treatment methods (10). The massage aims to help treating the nervous and cardiovascular system effectively and cause a feeling of well-being, relaxation and comfort (11).

In the case of the effect of massage therapy on vital signs, some studies have been conducted and inconsistent results have been achieved. Combron *et al.* reported that massage therapy can decrease systolic blood pressure and increase diastolic blood pressure (12). Massage can positively affect vital signs of patients admitted in ICU that may be due to its relaxant and anti-stress effects (13). According to Wang *et al.*, foot and hand massage can decrease the pain and reduce the respiration and heart rates; however, it doesn't affect blood pressure significantly (14). Holland and Pokorny showed that massage can significantly reduce the heart and respiration rates as well as the systolic and diastolic blood pressures (15). However, Hattan *et al.* and Cox and Hayes reported that massage has no effect on physiological parameters such as blood pressure, pulse rate and respiration (16, 17). Massage therapy has been used in intensive care units to reduce patients' physical and psychological problems (18) and to prevent sympathetic responses (19). However, in all the mentioned studies massaging has been done by a nurse and the patients' family did not play a role. Also in previous studies, a limited part of the body had been massaged for a short time (about 15 to 20 minutes). No previous study has investigated the effects of total body massage done by a patient's relative, on vital signs of patients suffering from ACS and AMI.

2. Objectives

The present study aimed to examine the effects of massage therapy by patient's relative on vital signs of patients with ACS and AMI.

3. Patients and Methods

It was a randomized controlled trial conducted on male patients hospitalized in coronary care units (CCU) of Shahid Beheshti hospital in Kashan, Iran. The participants meeting the inclusion criteria were identified and invited to the study by daily file review of patients' admitted to CCU wards and consulting with their treating physicians. The criteria for inclusion were: being male, being admitted in CCU, having a medical diagnosis of ACS or AMI, being literate, being alert, length of stay more than two days, willing to participate in the study, and not having severe dyspnea, fever, cardiac pacemaker, pulse rate less than 60/min, history of second degree burn in more than 25% of the body surface, known mental disorder, known infectious disease or hepatitis and jaundice, amputated limb, known adrenal gland disorder, known skin problem, diagnosed deep vein thrombosis, dialysis fistula and history of bone fracture in the past 2 months and previous history of massage therapy. The criteria for exclusion were: loss of consciousness, receiving warfarin and having cardiac arrest during the past 72 hours.

3.1. Sample Size

According to the previous studies (Cutshall *et al.*), and based on the following formula ($\alpha = 0.95$, $1-\beta = 0.8$, $d = 1.7$ and $\delta = 3.12$) (20), 23 people were needed for each group but 30 patients were selected in each group for more certainty. Samples were selected consecutively among the patients admitted in CCU and patients who entered the study were randomly allocated into the groups by tossing a coin (Figure 1). Data collection tool consisted of two parts. The first part included demographic data (age, marital status, occupation, patient's education, patient relative's education, patient's medical diagnosis and history of hospitalization). The second part included a table to record the patient's vital signs (diastolic blood pressure, systolic blood pressure, pulse rate, temperature, and respiration rate). Systolic and diastolic blood pressures were measured with a German Empire-N mercury sphygmomanometer, from the left arm, after resting for 15 minutes lying on back. Also, the radial pulse rate of the left hand was measured and recorded. Body temperature was measured by an oral thermometer for 5 minutes. Respiration was measured for one minute without patient's notice. In the intervention group, massage therapy was done by one of the patient's male relatives or family members on the third day of admission (because of passing the acute stages of the disease and training the patient's relative to do the massage therapy), after the physician's permission and after the patient's consent, in a private atmosphere

(in a private room or after drawing the curtains around the patient). A male relative was selected by each patient then he was trained for the massaging method. Then he was tested and after passing the test he was allowed to massage the patient. The training sessions of the relatives were conducted individually in a 2 hour session, on a human mannequin, in the practice room of nursing school. All the training sessions were conducted by the second researcher who had previously received the certificate in massage therapy. For each participant in the intervention group, one session of massage therapy (for 60 minutes) was done by the patient's relative. Almond oil was used for effleurage and massage facilitation. Back, shoulder deltoid muscles, front and posterior parts of legs, arms, forearms, front and back parts of thighs, palms and fingers, metatarsus, front and back of feet and toes, belly and chest, auxiliaries and neck muscles of the patients were massaged. Massage techniques used included static massage, surface tension techniques, stretching massage, superficial lymph unload, transverse friction techniques, and myofascial releasing techniques (21). All the massage sessions were conducted in the evening shifts. Areas with inflammation, petechiae, ecchymosis, subcutaneous hemorrhage, wounds and edema were not massaged. Half an hour before and 15 minutes after the end of massage therapy (in a condition which the patients were resting at least for 15 minutes) vital signs were measured. During massage therapy, the patients' heart rhythm was being monitored. The patients' personal information was collected through interviews and the clinical information extracted from the patients' files. For the control group there was no treatment and patients just received the routine care of the unit. In the control group, vital signs were measured and recorded first then they rested in bed for 75 minutes, when vital signs were re-examined.

3.2. Ethical Considerations

The current study was approved by the research institutional review board and the research ethics committee of Kashan University of Medical Sciences. The aim of the study was explained to all the participants and all of them signed the informed consent form before participation and were assured about the confidentiality and freedom to participate in the study. Data collection was done after permission of the hospital and units authorities.

3.3. Data Analysis

SPSS 11.5 software was employed to analyze the data using chi-square, Fisher exact test, independent t-test, paired t-test and descriptive statistics. A P value less than 0.05 was selected as significant level in all the tests.

4. Results

The average age of the participants was 58.9 ± 15.63 . Also, 90% of the patients were married, 65% were employed,

35% were retired or unemployed, 60% had primary school education and none of them had experienced massage therapy previously. The largest number of relatives (76%) were the patients' son and they mostly (60%) had high school education. The summary of the participants' characteristics are presented in Table 1. The pre intervention mean of systolic and diastolic blood pressure of the intervention group were 126.36 ± 16.80 and 77.76 ± 9.43 respectively which changed to 121.70 ± 13.31 and 76.23 ± 8.61 respectively, after the massage therapy session ($P = 0.021$ and $P = 0.164$ respectively). The mean of systolic and diastolic blood pressure of the control group did not change significantly at the end of the study (Table 2). The mean of pulse rate of the intervention group was 79.46 ± 10.41 before massaging and reached 69.30 ± 9.47 after the intervention ($P = 0.001$). The mean of the pulse rate of the control group at the beginning and the end of the study did not change significantly. An independent sample t-test was used, and a significant difference was observed between the pulse rates of both groups at the end of study (Table 2). The mean of the body temperature of the intervention group was 36.99 ± 0.51 before massaging which changed to 36.97 ± 0.44 after massage ($P = 0.565$). The average body temperature of subjects in the control group did not change significantly at the end of the study. No significant difference was observed between the mean of body temperature in the two groups, both before and after the intervention (Table 3). The respiration rate mean of the intervention group was 23.03 ± 3.86 before the intervention that reached 20.43 ± 3.59 after massage ($P = 0.001$). The respiration rate mean did not differ significantly in the control group at the end of the study. No significant difference was observed between the respiration rate mean in the two groups, both before and after the intervention (Table 3).

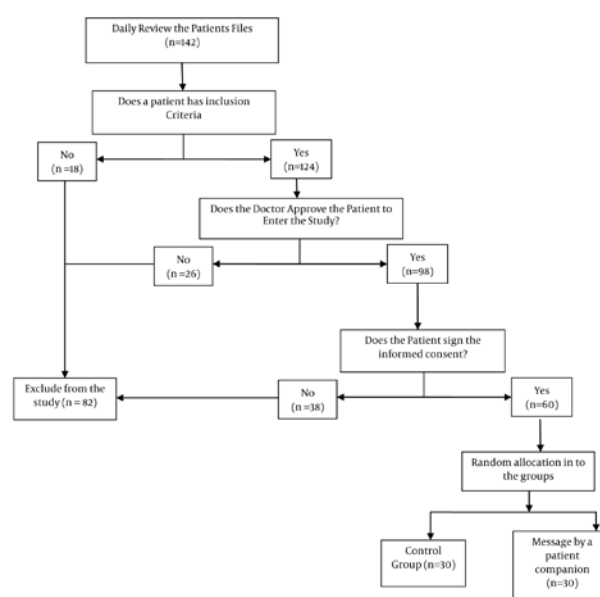


Figure 1. The Process of Sampling

Table 1. Personal Characteristics of the Patients

	Intervention, No. (%)	Control, No. (%)	P
Age, Mean ± SD	61.13 ± 13.58	56.66 ± 17.39	0.483
Medical diagnosis			0.342
Acute coronary syndrome	19 (63.33)	25 (83.33)	
Myocardial infarction	11 (36.66)	5 (16.66)	
Level of education			0.539
Elementary	21 (70)	21 (70)	
Secondary or higher	9 (30)	9 (30)	
Marital status			0.163
Married	29 (96.7)	26 (86.7)	
Single or widowed	1 (3.3)	4 (13.4)	
Previous hospitalization			0.500
Yes	12 (40)	19 (63.3)	
No	18 (60)	11 (36.7)	

Table 2. Mean of Systolic and Diastolic Blood Pressures and Pulse Rate of the Two Groups Before and After the Intervention

	Group		P (t Test)
	Massage by the Patient's Relative, Mean ± SD	Control, Mean ± SD	
Systolic blood pressure			
Before the intervention	126.36 ± 160.80	132.26 ± 16.80	0.478
After the intervention	121.70 ± 13.31	124.96 ± 15.92	0.392
P (Paired t Test)	0.021	0.151	
Diastolic blood pressure			
Before the intervention	77.76 ± 9.43	76.73 ± 10.64	0.179
After the intervention	76.23 ± 8.64	77.40 ± 10.54	0.597
P (Paired t Test)	0.164	0.288	
Pulse rate			
Before the intervention	79.46 ± 10.41	84.60 ± 13.41	0.083
After the intervention,	69.30 ± 9.47	84.66 ± 12.97	0.001
P (Paired t Test)	0.001	0.949	

Table 3. Mean Scores of Body Temperature of the Two Groups Before and After the Intervention

	Group		P (t Test)
	Massage by the Patient's Relative, Mean ± SD	Control, Mean ± SD	
Body temperature			
Before the intervention	36.99 ± 0.51	37.07 ± 0.52	0.902
After the intervention	36.97 ± 0.44	37.09 ± 0.37	0.565
P (Paired t Test)	0.332	0.083	
Respiration rates			
Before the intervention	23.03 ± 3.86	21.13 ± 4.05	0.226
After the intervention	20.43 ± 3.59	21.30 ± 4.16	0.251
P (Paired t Test)	0.001	0.134	

5. Discussion

The results of the current study indicated that the whole body massage therapy reduces systolic blood pressure. Hajihosseini *et al.* (2006) have indicated that massaging comatose patients legs reduces the mean of systolic blood pressure (13). Degirmen *et al.* have also reported that massaging feet and hands in post caesarean women not only affects pain control, but also reduces systolic blood pressure significantly (22). The mean of diastolic pressure of the patients in the present study did not significantly change after the massage therapy session. This finding is not consistent with the findings of Combron *et al.* (2006) who studied the changes in blood pressure after various forms of therapeutic massage and reported that massage therapy did not reduce the diastolic blood pressure significantly (12). However, Hajihosseini *et al.* and Degirmen *et al.* have reported that massage therapy of feet and hands have reduced the mean of diastolic blood pressure in comatose (13) and post caesarean patients (22). To justify the effect of massage therapy on blood pressure, Shiri (2010) has written that massage increases the pressure in tissues. Then, the gradient of pressure between the tissues and vessels will increase, and it facilitates the movement of liquids between tissues and vessels and vice versa. Such movement adjusts physiological criteria such as blood pressure (21). On the other hand, massage may distract the patient and consequently reduce his anxiety (23) that can finally decrease blood pressure and pulse rate. Also massage may induce the patients a sense of comfort and relaxation (24) and then endorphins may be secreted (25), vessels are being more dilated, the blood flow increases within the superficial vessels of body (26) and blood pressure will reduce. The results of the present study showed that massage therapy decreases pulse rate. This finding is consistent with some of the previous studies. Lindgren *et al.* have examined the physiological responses of healthy people to massage. They reported that pulse rate significantly reduced at 5 minutes after massage and this reduction continued for one hour (19). Shaban *et al.* have also studied the effect of foot massage on vital signs of patients admitted in intensive care unit and reported that the mean of heart beats reduced after the intervention (18). Hajihosseini *et al.* (13) and Degirmen *et al.* (22) have also reported that massage can decrease the heart rate. However, Degirmen *et al.* have found that this effect is over after 90 minutes (22). The reduction of pulse rate after the massage may also be related to the anxiolytic and parasympatomimetic effects of massage therapy (19, 24). The results of the present study indicated that massage therapy did not affect body temperature significantly. Further research is suggested to confirm the findings of the current study. A few studies are available on the effects of massage on body temperature. One study has reported that massage increases metabolism by 16.6% for a few minutes (27). On the other hand, the reduction

in anxiety, cortisol (19) and epinephrine (28) during massaging can be effective in continuity or temporariness of the mentioned effect. No significant difference was observed between the respiration rates in the two groups, both before and after the intervention. However, in the massage therapy group, the respiration rate significantly decreased after the intervention. Degirmen *et al.* have also reported that massage therapy in post caesarean women reduced the mean of respiration rate and this effect has lasted for 90 minutes (22). Such an effect has lasted for one day in the study by Hajihosseini *et al.* (13). The current study examined the effects of massage therapy by the patient's relative on vital signs of male patients admitted in CCU and showed that massage therapy by the patients' relatives, decreased systolic blood pressure, pulse and respiration rates of patients admitted in CCU. Because of the useful effects of those changes on the reduction of the myocardial oxygen demand, and comforting and anxiolytic effects of massage, it can be recommended that massage therapy by a member of the patient's family be used to balance vital signs of patients admitted in CCU. Individual characteristics of the persons who did the massage therapy may have affected the patients' anxiety levels and his vital signs. Such factors were beyond the control of the researchers. The patients' vital signs were measured 15 minutes after the massage therapy session. It is suggested that another study be done to examine vital signs in a longer period of time after massaging to find the lasting time of the effects.

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Authors' Contribution

Mohsen Adib-Hajbaghery (MAH) and Rahman Rajabi-Beheshtabad (RRB) were responsible for the study conception and design; Ali Abasi (AA) helped in the process of sampling, Ismail Azizi-Fini (IAF) and MAH made critical revisions to the paper for important intellectual content. RRB performed the data collection; MAH performed the data analysis, prepared the draft of the manuscript and supervised the study.

Financial Disclosure

The authors declare that they have no competing interests.

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References

1. Woods SL. Cardiac nursing. Philadelphia: Wolters Kluwer Health/ Lippincott Williams & Wilkins; 2010.
2. Hayes J, Cox C. Immediate effects of a five-minute foot massage on patients in critical care. *Intens Critic Care Nurs.* 1999;**15**(2):77-82.
3. Sharafi F. *The effect of Benson relaxation technique on anxiety of in patients with myocardial infarction* [M.Sc dissertation]. Tarbiat Modares University. 1994.
4. Akinpelu A, Olowe O. Correlative study of 3 pain rating. Scales among obstetric patients. *Afr J Med Med Sci.* 2002;**13**(2):123-6.
5. Brunner LS, Suddarth DS, Smeltzer SCOC, Bare BG. *Brunner and Suddarth's textbook of medical-surgical nursing*. Philadelphia: Lippincott; 2000.
6. Rymaszewska J, Kiejna A, Hadrys T. Depression and anxiety in coronary artery bypass grafting patients. *European Psychiatry.* 2003;**18**(4):155-60.
7. Eastwood J. *Nurses role in the cardiac catheterization laboratory*. In: Moser DK, Riegel B, editors. Cardiac nursing. Philadelphia, Pa.; Edinburgh: Elsevier Saunders; 2008.
8. Smith CA, Collins CT, Cyna AM, Crowther CA. Complementary and alternative therapies for pain management in labour. *Cochrane Database Syst Rev.* 2006(4):CD003521.
9. Sherman KJ, Cherkin DC, Kahn J, Erro J, Hrbek A, Deyo RA, et al. A survey of training and practice patterns of massage therapists in two US states. *BMC Complement Altern Med.* 2005;**5**:13.
10. Barnes PM, Bloom B, Nahin RL. Complementary and alternative medicine use among adults and children: United States, 2007. *Natl Health Stat Report.* 2008(12):1-23.
11. Kimber L, McNabb M, Mc Court C, Haines A, Brocklehurst P. Massage or music for pain relief in labour: a pilot randomised placebo controlled trial. *Eur J Pain.* 2008;**12**(8):961-9.
12. Cambron JA, Dexheimer J, Coe P. Changes in blood pressure after various forms of therapeutic massage: a preliminary study. *J Altern Complement Med.* 2006;**12**(1):65-70.
13. Hajhosseini F, Avazeh A, Elahi N, Shariati A, Souri H. The effect of massage on comatos patients' vital signs, hospitalized in intensive care units. *Arak Uni Med Sci J.* 2006;**9**(3):26-35.
14. Wang HL, Keck JF. Foot and hand massage as an intervention for postoperative pain. *Pain Manag Nurs.* 2004;**5**(2):59-65.
15. Holland B, Pokorny ME. Slow stroke back massage: its effect on patients in a rehabilitation setting. *Rehabil Nurs.* 2001;**26**(5):182-6.
16. Cox C, Hayes J. Physiologic and psychodynamic responses to the administration of therapeutic touch in critical care. *Intens Critic Care Nurs.* 1999;**15**(6):363-8.
17. Hattan J, King L, Griffiths P. The impact of foot massage and guided relaxation following cardiac surgery: a randomized controlled trial. *J Adv Nurs.* 2002;**37**(2):199-207.
18. Shaban M, Haji Amiry P, Mehran A, Kahrari S. Evaluation of immediate effect of foot massage on patient's vital signs in a general intensive care unit. *Hayat.* 2004;**10**(20):71-80.
19. Lindgren L, Rundgren S, Winso O, Lehtipalo S, Wiklund U, Karlsson M, et al. Physiological responses to touch massage in healthy volunteers. *Auton Neurosci.* 2010;**158**(1-2):105-10.
20. Cutshall SM, Wentworth LJ, Engen D, Sundt TM, Kelly RF, Bauer BA. Effect of massage therapy on pain, anxiety, and tension in cardiac surgical patients: a pilot study. *Complement Ther Clin Pract.* 2010;**16**(2):92-5.
21. Shiri M. *Massage therapy*. Aeeizh; 2010.
22. Degirmen N, Ozerdogan N, Sayiner D, Kosgeroglu N, Ayranci U. Effectiveness of foot and hand massage in postcesarean pain control in a group of Turkish pregnant women. *Appl Nurs Res.* 2010;**23**(3):153-8.
23. Billhult A, Maatta S. Light pressure massage for patients with severe anxiety. *Complement Ther Clin Pract.* 2009;**15**(2):96-101.
24. Buttagat V, Eungpinichpong W, Chatchawan U, Kharmwan S. The immediate effects of traditional Thai massage on heart rate variability and stress-related parameters in patients with back pain associated with myofascial trigger points. *J Bodyw Mov Ther.* 2011;**15**(1):15-23.
25. Kaada B, Torsteinb O. Increase of plasma β -endorphins in connective tissue massage. *General Pharmacol.* 1989;**20**(4):487-9.
26. Eungpinichpong W. *Therapeutic Thai Massage*. Bangkok: Chonromdek Publishing House; 2008.
27. Cuthbertson D. The effect of massage on the metabolism of normal individuals. *QJM.* 1932;**1**(3):387-400.
28. Field T, Diego M, Hernandez-Reif M. Massage therapy research. *Develop Rev.* 2007;**27**(1):75-89.