



RESEARCH ARTICLE

EFFECTIVENESS OF HAND AND FOOT MASSAGE ON POSTOPERATIVE PAIN AMONG ABDOMINAL SURGERY PATIENTS IN INTENSIVE CARE UNITS: A QUASI-EXPERIMENTAL STUDY

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ABSTRACT

Background: Postoperative pain remains a significant challenge among abdominal surgery patients despite the use of pharmacological pain management. Hand and foot massage is a simple, safe, and cost-effective complementary therapy that may reduce pain and improve patient comfort. **Objective:** To assess the effectiveness of hand and foot massage on pain at the surgical site among abdominal surgery patients. **Methods:** A quantitative quasi-experimental pretest and post-test control group design was adopted. Thirty abdominal surgery patients admitted to the Surgical ICU of Dayanand Medical College and Hospital (DMCH), Ludhiana, were selected using purposive sampling and allocated into experimental (n=15) and control (n=15) groups. Pain was assessed using the Numerical Pain Rating Scale before and after intervention. The experimental group received hand and foot massage twice daily for two consecutive days. **Results:** Significant reductions in pain scores were observed in the experimental group compared to the control group. Post-intervention observations on Day 1 and Day 2 showed statistically significant differences ($p=0.0001$) in pain reduction. **Conclusion:** Hand and foot massage is an effective non-pharmacological nursing intervention for reducing postoperative pain among abdominal surgery patients.

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INTRODUCTION

Pain is a general term that describes uncomfortable sensations in the body. It stems from activation of the nervous system. Pain can range from annoying to debilitating, and it can feel like a sharp stabbing or a dull ache. Pain can be constant, can start and stop frequently, or can occur under certain conditions. People respond to pain differently. Some people have a high tolerance for pain, while others have a low tolerance. For this reason, pain is highly subjective¹. Pain is a universal experience that can span a vast spectrum of intensity, from mild distress to excruciating agony. Pain defined by the International Association for the study of pain (IASP) "as an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage."² Pain is an unbearable sensation and makes the patient exposed to dangers. The proverb, no gain without pain may not be always true in postoperative period. It is well recognized that pain inadequately relieved is lethal and can lead to many complications in the postoperative period. Therefore, the pain resulted from surgery must be relieved absolutely³. Combination of Pharmacological and non-pharmacological therapies are desirable to attain the total pain relief. In man's hunt to gain liberty from pain, a few non-pharmacological therapies have been trendy for centuries.

But the result of these measures remains scientifically untested. Additional works on these therapies makes inroads in the discipline of pain relief.⁴ Analgesics have maximum effective dose; increasing the dose cannot increase pain relief but may increase side effects. Tolerance also may occur when larger doses of medicines are needed to provide the same amount of pain relief as the previous smaller dose. Although 12 pharmaceutical medications continue to serve as a major contributor to pain management, non-pharmaceutical techniques are increasingly used to provide pain relief.⁵

Physiological response to pain creates harmful effects that prolong the body's recovery after surgery. Patients routinely report mild to moderate pain even though pain medication has been administered. Complementary strategies based on some research findings are needed to supplement postoperative pain relief using pharmacologic management.⁶ Massage is the simple way of easing postoperative pain as well as aiding relaxation, promoting a feeling of well being and a sense of receiving good care. Massage is also thought to increase the threshold of pain through the release of endorphin. Massage is recognized as a safe treatment modality without risk or side effect.⁷ Foot and hand massage has the potential to assist in pain relief.

Massaging the foot and stimulates the receptors that activate the non-painful nerve fibers, preventing pain transmission from reaching consciousness.⁸ The foot and hand massage are an appropriate non pharmacological intervention in relieving acute postoperative pain in patient after abdominal surgery. The feet are easily accessible and can be massaged without disturbing the patient's privacy.⁹

Material and Methods

A quantitative quasi-experimental pre-test and post-test control group design was used. The study was conducted in the Surgical Intensive Care Unit of Dayan and Medical College and Hospital (DMCH), Ludhiana, Punjab. Thirty patients who had undergone open abdominal surgery were selected through non-probability purposive sampling technique. Fifteen patients were assigned to the control group and fifteen to the experimental group. The patients included were of greater than 18 years of age and having second & third postoperative day. Patients excluded were those who are using any other complimentary treatment, having limb surgery and injury, having DVT, infection, on tramadol and having restricted limb movement. Pain intensity was measured using the Numerical Pain Rating Scale (0–10). In intervention the experimental group received hand and foot massage using coconut oil twice daily for two consecutive days. Each session lasted approximately 30 minutes and was administered one hour before pain medication.

Pre-intervention

- Written permission taken from the institution.
- Screening of the patients undergone abdominal surgery in surgery unit on the basis of inclusion and exclusion criteria was done.
- Obtained the written informed consent from the patients/attendants.
- The study subjects i.e., 30 were drawn from the target population by using non-probability purposive sampling allocation at the time of data collection into control group (n1= 15) and experimental group (n2= 15).
- Interview, Observation, Records and Reports were used to collect data regarding socio-demographic profile and clinical profile.

Pain level is assessed by using numerical pain rating scale

Intervention: Following guidelines were followed for the intervention:

Foot massage

- Foot of the patient placed in convenient position.
- Stood in front of the patient.
- Applied 5ml of coconut oil on feet. Gentle foot massage was given in left foot.
- Spread oil on the feet and leg and rub the oil from the heels to sole and toes.
- Stood in front of the patient.
- Hold the heel in one hand and start rotating the ankle in a gentle motion, four times left and four times right. Use the thumb and start to massage the top of the feet in a circular movement from toes to ankle.
- Hold the foot firmly, gently pull and rotate each toe three times right and three times left.
- Again massage the back of the toes and ball of the foot in a circular movement.

- Then finish the massage with gentle strokes along the feet and leg with fingertips.
- The steps 1-9 were repeated for right foot.
- Foot massage was given for 7 minutes 30 second.
- Foot massage given at morning, evening before 1 hour of pain medication for two consecutive days.

Hand massage:

- Hand of the patient placed inconvenient position.
- Stood at the left side to the patient.
- Applied 5ml of coconut oil. Gentle massage given left hand.
- Face the palm down. Press with the thumbs and make little circles around the wrist bone.
- Turn the wrist over and stroke the inside of the wrist with thumbs.
- Press firmly and stroke toward the palms and back to the wrist.
- Stroke should move towards the knuckles and then back towards the wrist.
- Then massage of the each fingers.
- Stroke the palm with firm, even motions that move away from the wrist. Then massage the center of the palm using circular motion and continue to the right hand.
- The steps 1-9 were repeated for right hand.
- Hand massage given at morning, evening before 1 hour of pain medication for two consecutive days.

Post intervention: After intervention pain level assessed by using numerical pain rating scale in experimental and control group.

RESULTS

The baseline pain scores were comparable between the experimental and control groups. However, significant reductions in postoperative pain were observed following hand and foot massage. Baseline analysis revealed a mean age of 39.06 ± 10.56 years for the control group and 48.86 ± 17.06 years for the experimental group. Statistical analysis established baseline homogeneity across major variables like gender, habitat, religion, and occupation, though expected regional variations in age, education, and socioeconomic strata were observed. Clinical parameters were balanced across both groups. Diagnoses primarily involved pancreatitis (46.67% control, 20.00% experimental) and bowel inflammation (26.67% both groups), alongside liver cirrhosis and intestinal blockages. High comorbidity rates (diabetes and hypertension) were noted in both groups. No statistically significant variations in clinical profiles were identified, confirming robust intergroup comparability. Comparative analysis using unpaired t-tests confirmed identical pre-test pain scores at the start of both intervention days. Post-intervention cycles showed highly significant reductions in pain scores within the experimental massage cohort compared to the control group across all observations (O2, O4, O6, O8), supporting the efficacy of the intervention.

DISCUSSION

The study demonstrated that hand and foot massage effectively reduced postoperative pain among abdominal surgery patients.

Table 1. Sociodemographic Profiles

N=30

Socio-demographic Variables	Control Group (n=15) f(%)	Experimental Group (n=15) f(%)	Chi-Square / Inference
Age (Years)			$\chi^2 = 14.167$, df = 4 p = 0.007*
18 – 25	01 (6.67)	03 (20.00)	
26 – 33	07 (46.67)	01 (6.00)	
34 – 41	03 (20.00)	00 (00.00)	
42 – 47	02 (13.33)	01 (6.67)	
48 & above	02 (13.33)	10 (66.67)	
Gender			$\chi^2 = 1.208$, df = 1 p = 0.272 (NS)
Male	06 (40.00)	09 (60.00)	
Female	09 (60.00)	06 (40.00)	
Habitat			$\chi^2 = 2.256$, df = 1 p = 0.133 (NS)
Rural	11 (73.33)	07 (46.67)	
Urban	04 (26.67)	08 (53.33)	
Educational Status			$\chi^2 = 8.200$, df = 3 p = 0.042*
Illiterate	04 (26.66)	03 (20.00)	
Primary	06 (40.00)	00 (00.00)	
Secondary	02 (13.33)	03 (20.00)	
Graduate & above	03 (20.00)	09 (60.00)	
Occupation			$\chi^2 = 3.466$, df = 1 p = 0.063 (NS)
Working	11 (73.33)	06 (40.00)	
Non-working	04 (26.67)	09 (60.00)	

Table 2. Clinical Profile Analysis

N=30

Clinical Profile	Control Group (n=15) f(%)	Experimental Group (n=15) f(%)	Chi-Square / Inference
Medical Diagnosis			$\chi^2 = 8.800$, df = 6 p = 0.185 (NS)
Pancreatitis	07 (46.67)	03 (20.00)	
Bowel Inflammation	04 (26.67)	04 (26.67)	
Liver Cirrhosis	02 (13.33)	03 (20.00)	
Intestinal Obstruction	00 (00.00)	02 (13.33)	
Uterus Cyst	00 (00.00)	02 (13.33)	
Other Conditions	02 (13.33)	01 (6.67)	
Presence of Comorbidities			$\chi^2 = 0.377$, df = 1 p = 0.539 (NS)
Yes	13 (86.67)	14 (93.33)	
No	02 (13.33)	01 (6.67)	

Table 3. Pain Intensity Outcomes

N=30

Observation Interval	Experimental Group (Mean ± SD)	Control Group (Mean ± SD)	Mean Diff.	t-value / p-value
Day1: Morning Pre-Test (O1)	5.47 ± 0.52	5.47 ± 0.52	0.00	t = 0.000 p = 1.000 (NS)
Day1: Morning Post-Test (O2)	4.20 ± 0.58	5.47 ± 0.52	1.27	t = 6.360 p = 0.0001*
Day1: Evening Pre-Test (O3)	4.53 ± 0.52	4.53 ± 0.52	0.00	t = 0.000 p = 1.000 (NS)
Day1: Evening Post-Test (O4)	3.47 ± 0.58	4.47 ± 0.52	1.00	t = 5.307 p = 0.0001*
Day2: Morning Pre-Test (O5)	5.00 ± 0.00	5.00 ± 0.00	0.00	t = 0.000 p = 1.000 (NS)
Day2: Morning Post-Test (O6)	3.87 ± 0.64	4.93 ± 0.26	1.06	t = 5.949 p = 0.0001*
Day2: Evening Pre-Test (O7)	4.00 ± 0.00	3.80 ± 0.41	0.20	t = 1.871 p = 0.071 (NS)
Day2: Evening Post-Test (O8)	2.80 ± 0.41	3.80 ± 0.41	1.00	t = 6.615 p = 0.0001*

These findings support previous research indicating that massage therapy stimulates mechanoreceptors, promotes relaxation, enhances circulation, and activates endogenous pain-modulating pathways.

As a nursing intervention, hand and foot massage is simple, safe, inexpensive, and easy to incorporate into routine postoperative care. The results reinforce the role of nurses in providing holistic pain management strategies beyond pharmacological treatment.

CONCLUSION

The study concluded that hand and foot massage significantly reduced postoperative pain among abdominal surgery patients admitted to intensive care units. Therefore, hand and foot massage can be recommended as an effective complementary nursing intervention for postoperative pain management.

LIST OF ABBREVIATIONS

ABBREVIATIONS	EXPANSION
DMCH	Dayan and Medical College & Hospital
CON	College of Nursing
Dept.	Department
N	Total number of samples
O1	Observation 1
O2	Observation 2
F	Frequency
G	Gauge
%	Percentage
NS	Non-significant
*	Significant
SD	Standard deviation
H ₀	Null hypothesis
χ^2	Chi square

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