

Effect of Foot Massage on Pain Level among Patients after Abdominal Surgery

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Abstract

Background: Nurse has an integral role in pain management through enhancing of foot massage as a non-pharmacological intervention to reduce post-operative abdominal pain.

Aim: this study aimed to determine the effect of foot massage on pain level among patients after abdominal surgery.

Setting: The study was conducted at Surgical Department in Menoufia University Hospital.

Subjects: A purposive sample of sixty four patients who had abdominal surgery assigned alternatively & randomly into two equal groups. Thirty two patients for each group (study & control).

Tools: 1- An interviewing questionnaire to assess socio demographic data & types of operations. 2-Numeric pain scale to assess subjective pain.

Results: There were statistically significant decreased of subjective pain score among study group rather than control group after foot massage. There was no significant relation between pain score and gender, education & marital status.

Conclusion: Foot massage has a positive effect on reducing pain after abdominal surgery.

Recommendation: Foot massage should be carried out routinely for managing pain after surgery

Key words: Foot massage, pain level, abdominal surgery.

I. Introduction

Pain is the most common reason for physician consultation and a major symptom in many medical conditions which significantly interfere with a person's quality of life and general functioning^(1, 2). Persistent postoperative pain is an unpleasant sensory and emotional experience following surgery. It is thought to be caused by nerve injury, which induced high-intensity pain in the first days following surgery⁽³⁾.

Post-surgical pain is a complex response to tissue trauma during surgery that stimulates hypersensitivity of the central nervous system. Postoperative pain following day surgery remains a challenge in the developed and developing world. Post-operative pain increases the possibility of post-surgical complications, raises the cost of medical care, and most importantly interferes with recovery and return to normal activities of daily living. Management of post-surgical pain is a basic patient right. When pain is controlled or removed, a patient is better able to participate in activities such as walking or eating, which will encourage his or her recovery. Patients will also sleep better, which aids the healing process⁽⁴⁾.

Management of postoperative pain relieves suffering and leads to earlier mobilization, shortened hospital stay, reduced hospital costs, and increased patient's satisfaction^(5,6). The major goal in the management of postoperative pain is minimizing the dose of medications to lessen side effects while still providing adequate analgesia. This goal is best accomplished with multimodal and preemptive analgesia⁽⁷⁾. Post-operative pain is poorly controlled by pharmacological means alone, but pain medicines may be more effective when combined with other pain relief techniques. Non pharmacological strategies based on research findings are needed to aid in postoperative pain relief as patients routinely report mild to moderate pain even though pain medications have been administered⁽³⁾.

Massage is a powerful part of pain management. It is the simple way of easing post-operative pain as well as aiding relaxation, promoting a feeling of well-being and a sense of receiving good care. In addition, it is recognized as a safe treatment modality without risk or side effects. The gate control theory stated that foot massage procedure inhibit the transmission of pain impulses to the brain which lead to decrease the pain intensity⁽³⁾.

Massage is considered a complementary and alternative medicine used by millions to relieve pain, reduce stress and anxiety, rehabilitate injuries and boost general health. Foot reflexology massage involves applying pressure to specific points on the feet in order to affect various parts of the body. By massaging key

reflex points in the feet, energy blocks are released within the human body, the immune system is stimulated, and toxins are dislodged so that the body can eliminate them naturally⁽⁸⁾.

Post-operative pain assessment and management is integral part of surgical nursing practice. Nurses are responsible for assessing, monitoring and treating pain, educating patients about their pain medications, ensure safety during pain medication administration, and advocate for patients with unrelieved pain⁽⁹⁾. Nurses have a significant role to play in controlling and relieving postoperative pain using different modalities such as Foot Massage (FM). Nurses can provide more effective postoperative pain management by increasing the use of FM^(10, 11).

II. Significance Of The Study

Postoperative pain has a negative impact on patient's outcome. The overall prevalence of moderate to severe postoperative pain reported is 17% to 40%, while a study by Sommer, de Rijke, Kaleef et al., (2007)⁽¹²⁾ revealed that 30-55% of the subjects suffered moderate to severe pain in the first day of operation. Foot massage as non pharmacological method is effective on reducing pain after surgery. It is easy, safe, non-invasive, and relatively cheap and most patients fell asleep while receiving foot massage^(13, 14, 15). So the current study determines the effect of foot massage on pain level among patients after abdominal surgery.

III. Aim Of The Study:

The aim of this study was to determine the effect of foot massage on pain level among patients after abdominal surgery.

Research hypotheses:

Patients of study group who received foot massage exhibits decreased pain score compared to the control group patients who do not.

IV. Subjects And Method

Design:

A quasi experimental research design was utilized to achieve the aim of the study

Setting:

The study was conducted at Surgical Department in Menoufia University Hospital.

Subjects:

A purposive sample of sixty four patients who had abdominal surgery assigned randomly and alternatively into two equal groups, 32 patients for each group study group (1): receive foot massage with routine hospital care. Control group (2) exposed only to routine hospital care.

Inclusion criteria: the study subjects were selected according to the following criteria:

- Adult patient
- Both sexes
- Conscious and able to give response for pain
- Has no Diabetes mellitus
- Received ketolac: Ketolac is the most common analgesic used after operation in Menoufia University hospital. It strong analgesic used to relieve moderate and severe pain Has no foot disease or surgery.
- Pain score more than 3.
- No pervious foot massage.

Sample technique:

The subjects of our study were chosen from abdominal surgery department of Menoufia University Hospital which considered reference hospitals for abdominal surgery cases. During the period from first April to 30 November (2014) there were 200 cases admitted to abdominal surgery department. Only 64 cases met the inclusion criteria. The sample size and power of the study 32 patients in group (1) and 32 in group (2) were required with power of 80%, $\alpha=0.05$ and ratio of study to control (1:1) . The required sample size was determined using SPSS (power and sample size calculation soft were)

Tools of the study:

Based on the review of related literature two tools were used by the researchers for data collection:

Tool I: An interviewing questionnaire: it was developed by the researcher to assess patient's socio demographic data& types of operations. It was comprised of questions related to patient's age, sex, marital status, education, occupation and types of operation.

Tool II: Visual Analogue Scale (VAS). It was developed by Bain et al., 2005⁽¹⁶⁾ to rate the level of pain intensity. The measurement was from zero to ten, in which zero means no pain while a score from 1 to 3 denoted mild pain, a score from 4 to 6 indicated moderate pain and a score from 7 to 10 illustrated worst pains.

V. Method

- **An official permission** was obtained from the head of surgical department of Menoufia University Hospital after explanation of the study and its purpose.
- **Ethical consideration:** a verbal and written consent was obtained from each patient to gain his / her cooperation. Each patient has a right to withdrawal from the study without any effect on their hospital routine care.
- **Tool development:** the first tool was developed by the researcher, after review of literature while the second tool was developed by Bain et al., 2005⁽¹⁶⁾. The tool was tested for content validity by two experts in the field of nursing specialty and three experts in field of surgery. Modifications were done to ascertain relevance and completeness.
- **Reliability of the tools:** all tools were tested using attest retest method and a pearson correlation coefficient formula were used. It was 8.7 for tool I and 0.94 for tool II.
- **A pilot study** was carried out before starting the actual data collection the purpose of the pilot study was to ascertain the clarity and applicability of the study tool and to identify the obstacles and problems that may be encountered during data collection. Based on the results of the pilot study modifications, clarifications, omission and rearrangements of some questions were done. A pilot study was carried out on 6 adult patients. The sample of pilot study was excluded from the total sample to assure the stability of the result.

Data Collection:

- Data were collected over a period of 8 month during the period from first of April to the end of November 2014
- The researchers met the head nurse of the surgical department and explained the research and its aim, then asked her about the patients who involved in operational list.
- Patients interviewed and selected according to inclusion criteria before operation. Then the researchers met the patients again after operation and received analgesic 5 hours ago.
- Each participant was assessed for pain and its intensity using Visual analogue pain scale, and if the pain degree was more than three out of ten the researcher applied the foot massage for 30 minutes. Immediately the pain score was evaluated.
- Then the pain score evaluated again after 2 hours, and if the pain degree was more than three out of ten the researcher applied the foot massage for 30 minutes again and immediately the pain score was evaluated.

Implementation of Foot Massage:

The foot massage was applied to the study group for two sessions by the researchers. First session: foot massage was applied at 5th hours after Ketolac administration. The half-life time elimination average of Ketolac is 5 hours. After 5 hours the concentration of Ketolac decreased until 8 hours and the pain intensity would be high again. For this reason, the application of the foot massage as a complementary therapy at 5 hours after Ketolac was an appropriate time to reduce the pain. Second session: after two hours from first session.

Technique of Foot Massage as Follow:

At first the researcher warmed the patient's legs as a preparation for foot massage. The researcher used three basic techniques of foot massage. These techniques are petrissage, effleurage, and friction; all have an effect on reducing postoperative pain. Foot massage was started with the left foot then the right foot, the right foot doesn't have a heart reflex point. When finished, the foot massage ended with some stretching techniques for foot and calf muscles.

Petrissage technique: starting gently, working slowly and rhythmically. Compressed ankle and toes, then released, repeated 3-5 times. Pushed toes forwards by leaned in, and then released, repeated 3-5 times. Crossed foot, compressed ankle and toes, also repeated 3-5 times. Friction technique, compressed the heart reflex point by using a thumb on the left foot for five times. Petrissage, effleurage and friction techniques used to compress the other reflex points in the foot, each reflex point repeated five times. When finished, the foot massage ended with some stretching techniques for foot and calf muscles.

Statistical analysis:

Results were statistically analyzed by statistical package SPSS version 20 (SPSS Inc., Chicago III). For quantitative variable, Student's t-test was used for parametric data and Mann-Whitney test for a non-parametric data. Chi-Squared (χ^2) was used for qualitative variable. P <0.05 was considered Significant.

VI. Results

Table (1) this table illustrated distribution of socio-demographic characteristic of studied sample. It revealed that, the mean age of studied sample was 39.12 ±10.30 & 40.96±10.61 for study & control group respectively. More than two third of studied sample were female 68.8% &75.0%, for study & control group respectively. The majority of studied sample were married, 93.8 %, 81.2% for study & control group respectively.

Table (2) this table illustrated distribution of studied sample according to types of operations. It showed that more than two third (68, 8%) of study group had cholecystectomy, while more than one third of control group (40.6%) had appendectomy.

Table (3): illustrated that distribution of surgical abdominal pain score among studied group before and after foot massage. This table showed that, there were statistically significant decreased of subjective pain score among study group rather than control group after foot massage P-value <0.001.

Figure (1) illustrated that mean pain score among study and control group before and after foot massage. This figure showed that, the mean pain score decreased in the study group rather than control group after foot massage (3.15).

Table (4): illustrated that the relationship between pain score and socio-demographic characteristic of study group before and after foot massage. This table showed that, there was no statistically significant difference relationship between pain score regarding age, sex, marital status, education. While there was statistically significant difference relationship between pain score & occupation before foot massage.

Table (1): Distribution of Socio demographic characteristics of studied sample.

	Groups				Test	P-value
	Study (N=32)		Controls (N=32)			
Age Mean ±SD	39.12 ±10.30		40.96±10.61		t= 0.70	0.484
Sex :(No. %)					$\chi^2=0.30$	0.578
Male	10	31.2	8	25.0		
Female	22	68.8	24	75.0		
Marital status :(No. %)					$\chi^2=2.95$	0.399
Single	2	6.2	4	12.5		
Married	30	93.8	26	81.2		
Widow	0	0.0	1	3.1		
Divorced	0	0.0	1	3.1		
Education :(No. %)					$\chi^2=1.15$	0.765
Illiterate	6	18.8	6	18.8		
Basic	7	21.9	4	12.5		
Secondary	12	37.5	15	46.9		
High	7	21.9	7	21.9		
Occupation :(No. %)					$\chi^2=0.59$	0.442
Working	14	43.8	11	34.4		
Not working	18	56.2	21	65.6		

Table (2): Distribution of studied sample according to types of operations.

Operation Type	Groups			
	Study (N=32)		Controls (N=32)	
	No	%	no	%
Cholecystectomy	22	68.8	12	37.5
Appendectomy	3	9.4	13	40.6
Hysterectomy	1	3.1	1	3.1
Abdominal mass	1	3.1	2	6.2
Exploration	3	9.4	2	6.2
Cancer	2	6.2	2	6.2

Table (3): Percentage distribution of surgical abdominal pain score among studied sample before and after foot massage

	Groups				Test	P-Value
	Study (N=32)		Controls (N=32)			
	no	%	No	%		
Pain pre					χ^2 4.65	0.031
Moderate	6	18.8	14	43.8		
Severe	26	81.2	18	56.2		

Pain post(1)						
Mild	29	90.6	0	0.0	χ^2 53.80	<0.001
Moderate	3	9.4	17	53.1		
Severe	0	0.0	15	46.9		
Pain post(2)					χ^2 43.89	<0.001
Mild	26	81.2	0	0.0		
Moderate	6	18.8	31	96.9		
Severe	0	0.0	1	3.1		

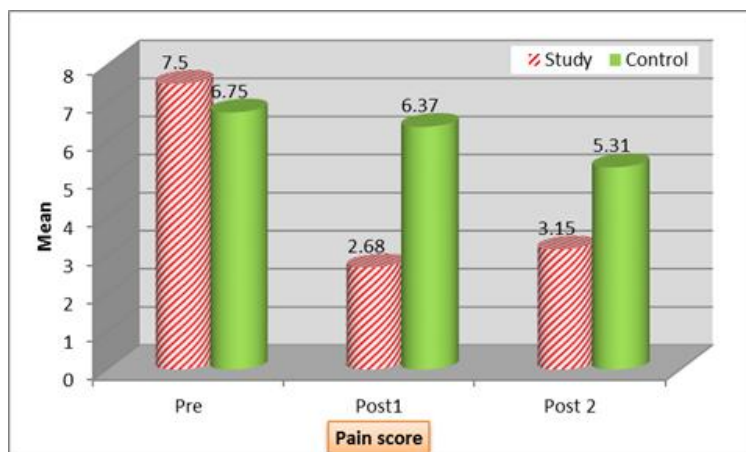


Figure (1) mean pain score among study and control group before and after foot massage

Table 4: Relation between pain score and socio demographic characteristic of study group before and after foot massage

	Pain score					
	Pre		Post1		Post 2	
	Mean ±SD	Test P value	Mean ±SD	Test P value	Mean ±SD	TestP value
Age						
<37	7.43 ±1.09	t=0.33	2.37 ±0.80	t=0.78	2.68 ±0.60	t=0.69
≥37	7.56 ±1.03	P=0.742	2.56 ±0.51	P=0.439	2.81±0.40	P=0.495
Sex :						
Male	7.90 ±0.73	MW=1.34	2.50 ±0.52	MW=0.11	2.90 ±0.31	MW=1.10
Female	7.31 ±1.12	P=0.180	2.45 ±0.73	P=0.908	2.68±0.56	P=0.270
Marital status						
Single	8.0 ±0.0	MW=0.73	3.0 ±0.0	MW=1.23	3.0 ±0.0	MW=0.75
Married	7.46 ±1.07	P=0.463	2.43±0.67	P=0.218	2.73±0.52	P=0.449
Education :						
Illiterate	6.83 ±1.16	F=3.18	2.83 ±0.40	F=0.75	3.0 ±0.0	F=3.21
Basic	8.14 ±0.69	P=0.463	2.42±0.78	P=0.531	2.85±0.37	P=0.038
Secondary	7.16 ±1.11		2.33 ±0.65		2.83 ±0.38	
High	8.0 ±0.57		2.42 ±0.78		2.28±0.75	
Occupation						
Working	8.14 ±0.77	MW=3.04	2.35 ±0.63	MW=1.07	2.57 ±0.0	MW=1.69
Not working	7.0 ±0.97	P=0.002	2.55 ±0.70	P=0.283	2.88±0.32	P=0.091

VII. Discussion

Foot massage is an independent nursing intervention that can be applied for the reduction of acute postoperative pain. It is easy, don't need special equipment, has low cost, safe and can be applied to patients in many cultures⁽¹⁴⁾.

The present study revealed that, more than two third of the studied sample were female and had cholecystectomy in the study group. This result was supported by Smeltzer & Bare⁽¹⁷⁾ who stated that, female sex is much more likely than men to develop gallstone. It may be related to women are probably at increased risk because estrogen stimulates the liver to remove more cholesterol from blood and divert it into the bile therefore lead to stones formation and causes cholecystitis.

In the present study the pain level ranged from moderate to severe pain before foot massage. This result supported by Asadizaker et al⁽¹⁸⁾ who revealed that, the level of postoperative pain was moderate to severe. It usually a direct result of tissue trauma and the severity of pain reflect degree of tissue damage.

Regarding pain score after intervention, this study showed that, there was statistically significant decreased of subjective pain score among study group rather than control group after foot massage. This result was in the same line with Chanif⁽¹⁹⁾ and Wang and Keck⁽²⁰⁾ who revealed that, there was a significant

difference in the pain score compared between the experimental and the control group after administration of foot massage. A significant difference between intervention and control group had found. This may be due to massage stimulates non painful nerve fibers and releases endorphins; it has the potential ability to assist in pain relief.

The present study found that the mean score of pain among control group also decreased. This result in the same line with **Degirmen et al.**,⁽²¹⁾ who reported that pain intensity level of those in the control group decreased after 2 hours of receiving analgesics medication. It may be related to the prescribed analgesic by doctor.

In this study, it was noticed that there was no significant difference relationship between pain score and gender. This was in agreement with **Celik, et al**⁽²²⁾ who found that there was no significant relationship between pain score and gender. Also it was noticed that there was no significant difference relationship between pain score and age. This was in the line with **Edwards & Fillingham**⁽²³⁾ who found that there were no differences in the response of pain between younger adults and older adult patients. The result of the present study revealed that, there was statistically significant difference between pain score & occupation before foot massage. It may be related to more psychological stress that those people faced due to decreased monthly income.

VIII. Conclusion

Based on the results of this study, it can be concluded that:

Foot massage has a positive effect on reducing pain after abdominal surgery. There was no statistically significant difference between pain score and socio-demographic characteristics (age, sex, marital status, education).

IX. Recommendation:

1-Continuous developmental sessions on the technique of foot massage should be provided for all nurses in the surgical departments.

2-Foot massage should be carried out routinely for managing pain after surgery.

3- Replication of the study using a large probability sample from different geographical areas must be considered in the development of future research to allow generalization of the result.

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