The Effectiveness of Effleurage Back Massage Therapy on Pain, Pulse, Systolic Blood Pressure, Diastolic Blood Pressure, and Respiration among Post-Operative Clients in Selected Hospitals, Andhra Pradesh

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Abstract

Background of the Study: The pain alters the quality of life and pain management can lead to many consequences affecting the client. Effleurage back massage can have mechanical, neurological, psychological, and reflexive effects.

Aim: The aim of the study was to assess the effectiveness of effleurage back massage on pain and physiological parameters among post-operative clients.

Method: The study was quantitative evaluative approach with quasi-experimental time series design. Purposive sampling technique was used to select 200 post-operative clients. Experimental group and control group consisted of 100 samples each. Reliability of the tool was elicited using inter-rater method and it was found to be reliable, r = 1. The data were collected by interview schedule and measurement 1st–5th post-operative day twice in a day. An intervention of effleurage back massage with talcum powder was given morning and evening for 10–15 min to the experimental group over a period of 5 days from 1 to 5 post-operative day.

Results: The results in the experimental group showed that the 1st day pulse pre–test mean score was 113.04 which was reduced to 108.86 by 5-day post-test score, systolic blood pressure (BP) mean score was 136.54 which was reduced to 112.06, diastolic BP mean score was 76.92 which was reduced to 72.82, and respiratory rate mean score was 31.52 which was reduced to 26.269 by the 5th day post-test scores and was found to be a non–significant showing not much effect on physiological parameters.

Conclusion: The experimental group sample received effleurage back massage twice in a dayfrom 1stpost -operative day to 5thpost - operative day, levels were analyzed, in the controlgroup sample not given effleurage back massage, levels were analyzed. Control groupvalues did not show an significant difference between pre-test and post-test.Experimental group values pain was significant difference between pre-test and posttest.

Keywords: Back massage, diastolic blood pressure, effleurage, pain management, physiological parameters, systolic blood pressure

Introduction

Pain is a major economic problem and a major cause of disability that hampers the lives of many people. There is overwhelming evidence that pain was under treated in the hospitals. In the last decade alone, numerous studies have continued to prove that pain is still not adequately treated in all areas of health care. Inadequate pain management can lead to many consequences affecting the client. Although the historic role of nurses has been to relieve pain and suffering, there has been little understanding of the complexity of pain and only limited ways to manage it. The nursing interventions should be meaningful and affordable by the clients. In terms of this aspect, the present study is relevant to the profession.

Although, it is not practiced in all worldwide settings, significant number of studies shows that effleurage back

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massage will have reduction in pain. The researcher in her personal experience also observed that patients have inadequate knowledge regarding the benefits of back massage. Hence, the present study was selected to assess the effectiveness of effleurage back massage on pain and physiological parameters among the post-operative clients. The mechanisms in human body are far beyond knowledge. Each system assigned with its specific functions to ensure a safe functioning. A slight disturbance can lead to its deviation and results in variety of changes in temperature, pulse, respirations, blood pressure (BP), and pain.[1]

Pain is very common in patients after surgery. Pain is a universal human experience and the most common reason people seek medical care. Pain tells something which is wrong in the structure or function of the body. Traditionally pain was considered merely a physical symptom of illness or injury, and a simple stimulus-response mechanism. When a patient experiences pain, there may be changes in temperature, pulse, respirations, and BP as well.[2]

Pain is an unpleasant sensory and emotional experience resulting from actual or potential issue damage. The pain is classified as: Acute pain: Acute pain is sudden in onset and lasts for <3 months. Chronic pain: Pain is gradual or sudden and it lasts for >3 months. Acute-on-chronic pain: Acute pain flare superimposed on underlying chronic pain.

The pain alters the quality of life more than any other health-related problem, interfering with sleep, mobility, thought, emotional well-being, sexual activity, and creativity. Yet, pain is one of the least understood and most undertreated often discounted problems faced by health-care providers.[5]

Pain management is considered as an important part of care that the American Pain Society refers to pain as "the fifth vital sign" to emphasize its significance and to increase the awareness among health-care professionals of the importance of effective pain management.[3,4]

Effleurage back massage can have mechanical, neurological, psychological, and reflexive effects. It can be used to reduce pain, promote sedation, mobilize fluids, increase muscular relaxation, and facilitate vasodilation. Effleurage back massage can be a preliminary treatment to target the health of soft tissues, while manipulation largely targets joints segments.[6]

Effleurage back massage is one of the types of massage which is characterized by the focus of pressure by moving the hands or gliding over the skin. Effleurage can be superficial or deep. Light strokes stimulate cutaneous receptors and act by neuroreflexive or vascular reflexive mechanisms, whereas deep stroke techniques mechanically mobilize fluids in the deeper soft-tissue structure. Effleurage back massage may be used to gain initial relaxation and patient confidence occasionally to diagnose muscle spasm and tightness and to provide contact of the practitioner hands from one area of the body to another. The main mechanical effect of effleurage back massage is to apply sequential pressure over contiguous of tissues so that effleurage back massage produces some mechanical effects on the body.[7-9]

Effleurage massage has particular benefits for the person in pain, control BP, and respiratory rate. It can provide deep heat and stimulation to an injured area, providing increased healing and reduced effects of inflammation. Body has different nerve receptors to take different messages back to the brain. Some of these messages travel quicker than others. Pleasurable messages travel quicker than painful ones. By effleurage massaging, we can have two positive effects on BP. First, we help the client relax and their heart rate decreases.

Objectives

The objectives of the study were as follows:
- To assess the pre-test level of pain and physiological parameters among post-operative clients.
- To assess the effectiveness of effleurage back massage therapy on pain and physiological parameters among post-operative clients.
- To find out the association between the scores of post-test pain levels with selected demographic variables. Research approach adopted for the present study is a quantitative evaluative approach which aims at evaluating the effectiveness of effleurage back massage therapy on pain and physiological parameters among post-operative clients.

Groups		Day 1		Day 3		Day 5
EG	EPR	EPS1 X EPS2	EPR	EPS1 X EPS2	EPR	EPS1 X EPS2
CG	CPR	CPS1 0 CPS2	CPR	CPS1 0 CPS2	CPR	CPS1 0 CPS2

EG: Experimental group, CG: Control group, EPR: Experimental group pre-test, CPR:Control group pre-test, EPS1: Experimental group post-test-1, EPS2: Experimental group post-test-2, CPS1: Control group post-test-1, CPS2: Control group post-test-2, X: Intervention, 0: No Intervention.

Target population

The sample for the present study includes post-operative clients who underwent cardiothoracic and abdominal surgeries at Omni Hospital for the control group and Medicover Hospital, Visakhapatnam for the experimental group. Post-operative clients are on their 1st post-operative day after cardiothoracic and abdominal surgeries. The purposive sampling used for sample collection and structured interview schedule, observation checklist, and numerical pain scale used for data collection.

Sample size

The sample size for the present study is 200 post-operative clients who underwent cardiothoracic and abdominal surgeries (100 in experimental and 100 in control group) who meet the inclusion criteria.

Inclusion criteria

Post-operative clients who:

- Have under gone cardiothoracic and abdominal surgeries
- Are on their 1st post–operative day
- Are conscious, well oriented and who can express their pain
- Are willing to participate
- Are able to remain in lateral or semi-fowler's position for 10–15 min.

Exclusion criteria

Post-operative clients who are:

- Allergic to talcum powder
- Having any post-operative complications.

METHODS OF DATA COLLECTION

- Structured interview used for the collection of demographic data
- Measurement of physiological parameters – BP using sphygmomanometer, pulse through palpation, and respiration through observation
- Numerical pain scale used for pain measured.

The sequences of phases of the study include:

1. The details of the study and need for the study were explained to the post-operative clients and a written informed consent was obtained. The information was collected as per the demographic pro forma
2. Pre-test was done by observation of the physiological parameters and by checking the pain scores
3. Intervention: Effleurage back massage was given from the 1st post–operative day to 5th post–operative day for 10–15 min 2 times in day, that is, morning and evening in the experimental group
4. Post-test was done by observing the physiological parameters and pain levels of post-operative clients in both the experimental and control groups.

Null hypotheses

- Ho1: There will be no significant (NS) difference post-test values in the pain and physiological parameters among post–operative clients in the experimental group in between the days, that is, day 1 versus day 3, day 3 versus day 5, and day 1 versus day 5
- Ho2: There will be NS difference post-test in the pain and physiological parameters among post-operative clients in the control group in between the days, that is, day 1 versus day 3, day 3 versus day 5, and day 1 versus day 5
- Ho3: There will be NS difference in the pre- and post-test values of pain and physiological parameters among post-operative clients in the experimental and control group on day 1, day 3, and day 5
- Ho4: There will be NS association between the post-test level of pain with selected demographic variables in the experimental group
- Ho5: There will be NS association between the post-test level of pain with selected demographic variables in the control group.

Statistical analysis and plan for data analysis

The analysis and interpretation were done based on the objectives of the study. The purpose of analysis was to reduce the data to an interpretable form so that research problem could be studied and tested. The collected data were coded and transferred to the master data sheet for statistical analysis.

The following plan was made to analyze the data:

1. Organize the data in master sheet and compute
2. Demographic data in the form of frequency and percentage
3. Mean and standard deviation of the pre- and post-test scores for physiological parameters and pain levels in both the experimental and control groups
4. Paired t-test to find the significance of study on pain and physiological parameters between two groups
5. The data have been represented in the form of tables and graphs wherever it is applicable
6. Chi-square test was used to identify the association between demographic variables with post-test scores.

Section-I

Age

In the experimental group, 48% of subjects were in 50–60 years and control group 37% of subjects were between 30–40 and 30–40 and 40–50 years.

Gender

In the experimental group, 72% are male and in the control group 55% were in female.

Type of surgery

In the experimental group, 67 in cardiothoracic and the control group higher than experimental that is 76% [Table 1].

Intensity of pain

In the experimental group, 82% had severe pain and the control group is more pain than the experimental group 93%.

Section-II

Part-A

Table 2 clearly shows that day 1 – the mean of pre-test pain levels exhibited by clients in the experimental group was 9.40 ± 0.816 to day 5: 5.04 ± 0.665 whereas in day 1 control group, it was 9.44 ± 1.057 to day 5 5.33 ± 1.886.

There is a reduction in mean of post-test pain levels from day 1 to day 5 in the experimental and control group.

Part-B

Table 3 clearly shows that day 1 – the mean of pre-test pain levels exhibited by clients in the experimental group was 113.04 ± 14.315, post-test – 103.90 ± 13.997 to day 5: Pre-test 108.86 ± 14.648, post-test 2 – 99.59 ± 13.971 whereas in day 1 control group, pre-test 104 ± 24.393, post-test-2 111.72 and day 5 pre-test was 104.45 ± 12.257 and post-test-2 109.53 ± 11.277.

It is evident from Table 3 that there is not much difference in means of pulse rate from day 1 to day 5 in the experimental and control groups.

Part-C

Table 4 clearly shows that day 1 – the mean of pre-test systolic BP (SBP) exhibited by clients in the experimental group was 136.54 ± 11.998, post-test 2126.24 ± 13.389 to day 5: Pre-test 120.08 ± 10.365, post-test-2 112.06 ± 10.823 whereas in day 1 control group, pre-test 133 ± 10.379, post-test-2 137.02, 11.547 and day 5 pre-test was 1202.81 ± 12.257 and post-test-2 126.40 ± 12.327.

It is evident from Table 4 that there is no much difference in means of SBP readings from day 1 to day 5 in the experimental and control groups.

Part-D

Table 5 clearly shows that day 1 – the mean of pre-test SBP exhibited by clients in the experimental group was 76.92 ± 12.790, post-test-2 65.34 ± 11.864 to day 5: Pre-test 72.82 ± 7.633, post-test 61.05 ± 7.697 whereas in day 1 control group, pre-test 73.97 ± 10.053, post-test-2 76.81, 11.953 and day 5 pre-test was 73.39.39 ± 9.493 and post-test – 78.13 ± 9.175.

There is a decreasing trend in mean values of diastolic BP (DBP) readings in pre- and post-tests in the experimental group in comparison with the control group.

Part-E

Table 6 clearly shows that day 1 – the mean of pre-test SBP exhibited by clients in the experimental group was 76.92 ± 12.790, post-test 2 65.34 ± 11.864 to day 5: Pre-test 72.82 ± 7.633, post-test 61.05 ± 7.697 whereas in day 1 control group,

Table 1: Description of demographic variables of post-operative clients in the experimental and control group, $n=200$

Demographic variables	Experimental group ($n1=100$)		Control group ($n2=100$)		Total
	f	%	F	%	
Age in years					
30–40	15	15	37	37	52 (26)
40–50	37	37	37	37	74 (37)
50–60	48	48	26	26	74 (37)
Gender					
Male	72	72	45	45	117 (58.5)
Female	28	28	55	55	83 (41.5)
Type of the surgery					
Cardiothoracic	67	67	76	76	143 (71.5)
Abdominal	33	33	24	24	57 (28.5)
Grade the intensity of pain					
None	0	0	0	0	0
Mild	0	0	0	0	0
Moderate	18	18	7	7	12.5
Severe	82	82	93	93	87.5

Table 2: Comparison of pre- and post-test levels of pain to the experimental and control groups, $n=100$

Days	Experimental		Control	
	Mean	SD	Mean	SD
1st day				
Pre-test	9.40	0.816	9.44	1.057
Post-test-1	5.06	1.705	8.47	0.858
Post-test-2	4.88	1.559	8.12	0.879
3rd day				
Pre-test	7.76	1.120	7.68	1.043
Post-test-1	2.29	0.820	7.14	1.491
Post-test-2	2.21	0.891	7.16	1.594
5th day				
Pre-test	5.04	0.665	5.33	1.886
Post-test-1	1.12	0.409	4.69	2.364
Post-test-2	1.09	0.321	4.80	2.445

Table 3: Comparison of pre- and post-test pulse rate to the experimental and control group, $n=100$

Days	Experimental		Control	
	Mean	SD	Mean	SD
1st day				
Pre-test	113.04	14.315	104.29	24.393
Post-testt1	104.80	13.578	108.91	19.328
Post-test-2	103.90	13.997	111.72	19.768
3rd day				
Pre-test	113.39	16.059	110.05	11.223
Post-test-1	105.71	17.259	107.96	21.806
Post-test-2	104.26	16.409	115.23	10.256
5th day				
Pre-test	108.86	14.648	104.45	12.257
Post-test-1	100.69	13.875	105.60	12.501
Post-test-2	99.59	13.971	109.53	11.277

Table 4: Comparison of pre- and post-test systolic blood pressure rate to the experimental and control group, $n=100$

Days	Experimental		Control	
	Mean	SD	Mean	SD
1st day				
Pre-test	136.54	11.998	133.01	10.379
Post-test-1	128.08	13.510	135.22	9.811
Post-test-2	126.24	13.389	137.02	11.547
3rd day				
Pre-test	128.70	13.822	130.55	11.312
Post-test1	120.95	12.884	130.88	9.945
Post-test-2	120.79	10.734	134.10	8.801
5th day				
Pre-test	120.08	10.365	122.81	12.782
Post-test-1	114.83	10.696	123.06	11.037
Post-test-2	112.06	10.823	126.40	12.327

Table 5: Comparison of pre- and post-test diastolic blood pressure rate to the experimental and control group, $n=100$

Days	Experimental		Control	
	Mean	SD	Mean	SD
1st day				
Pre-test	76.92	12.790	73.97	10.053
Post-test-1	68.01	12.384	73.83	10.581
Post-test-2	65.34	11.864	76.81	11.953
3rd day				
Pre-test	74.52	12.108	75.89	11.607
Post-test-1	65.88	10.939	78.64	10.429
Post-test-2	62.80	10.472	78.41	12.469
5th day				
Pre-test	72.82	7.633	73.39	9.493
Post-test-1	63.96	7.217	75.95	8.723
Post-test-2	61.05	7.697	78.13	9.175

pre-test 73.97 ± 10.053, post-test-2 76.81, 11.953 and day 5 pre-test was 73.39.39 ± 9.493 and post-test – 78.13 ± 9.175.

It is clearly evident from Table 6 that there was a reduction in the mean values of respiratory rate in the experimental group in comparison with that of the control group.

Part-F

Ho1: There will be NS difference post-test values in the pain and physiological parameters among post-operative clients in the experimental group in between the days, that is, day 1 versus day 3, day 3 versus day 5, and day 1 versus day 5.

Table 7 describes about significant reduction in the pain and improvement in physiological parameters of pulse, SBP, DBP, and respiration from day 1 to day 3, day 3 to day 5, and day 1 to day 5 after effleurage back massage.

Pain, pulse, SBP, DBP, and respiration of effleurage back massage of calculated *"t"* value higher than table value at 99 degree of freedom. It shows that significance (S) whereas DBP day 3 versus day 5 calculated value is 1.862 less than table value 1.984. It shows that NS and respiration BP day 3 versus day 5 *"t"* calculated value −0.041 are less then table values 1.984. It shows that there is NS:

Table 8 clearly shows that the level pain difference among post-operative clients with effleurage back massage in the experimental group and no difference among DBP day 2 versus day 5 and respiratory BP day 3 versus day 5.

Part-G

Ho2: There will be NS difference post-test in the pain and physiological parameters among post-operative clients in the control group in between the days, that is, day 1 versus day 3, day 3 versus day 5, and day 1 versus day 5.

Table 9 describes about significant reduction in the pain and improvement in physiological parameters of pulse, SBP, DBP, and respiration from day 1 to day 3, day 3 to day 5, and day 1 to day 5 with effleurage back massage.

Pain, pulse, SBP, DBP, and respiration of effleurage back massage of calculated *"t"* value higher than table values at 99 degree of freedom. It shows that significance (S) whereas DBP day 3 versus day 5 calculated *"t"* value is 0.229 less than

Table 6: Comparison of pre- and post-test respiratory rate to the experimental and control group, *n*=100

Days	Experimental		Control	
	Mean	SD	Mean	SD
1st day				
Pre-test	31.52	3.566	27.59	4.615
Post-test-1	25.89	4.921	28.36	4.357
Post-test-2	23.91	4.043	30.98	2.539
3rd day				
Pre-test	27.15	2.645	24.22	5.579
Post-test-1	20.50	2.427	25.14	5.925
Post-test-2	19.86	2.535	28.67	4.358
5th day				
Pre-Test	26.26	3.860	24.82	5.300
Post-test-1	20.85	3.230	25.75	4.743
Post-test-2	19.87	2.956	27.86	4.238

Table 7: Comparison of post-test scores of pain and physiological parameters between day 1 versus day 3, day 3 versus day 5, and day 1 versus day 5 in the experimental group, *n*=100

Parameters	Days	Mean	SD	Calculated Value	Df	Table value	Significance
Pain	Day 1 versus day 3	9.40	0.816	62.892	99	1.984	S*
		2.21	0.891				
	Day 3 versus day 5	2.21	0.891	14.320	99	1.984	S*
		1.09	0.321				
	Day 1 versus day 5	9.40	0.816	87.453	99	1.984	S*
		1.09	0.321				
Pulse	Day 1 versus day 3	113.04	14.315	6.176	99	1.984	S*
		104.26	16.409				
	Day 3 versus day 5	104.26	16.409	3.454	99	1.984	S*
		99.59	13.971				
	Day 1 versus day 5	113.04	14.315	10.112	99	1.984	S*
		99.59	13.971				
SBP	Day 1 versus day 3	136.54	11.998	16.847	99	1.984	S*
		120.79	10.734				
	Day 3 versus day 5	120.79	10.734	9.096	99	1.984	S*
		112.06	10.823				
	Day 1 versus day 5	136.54	11.998	17.490	99	1.984	S*
		112.06	10.823				
DBP	Day 1 versus day 3	76.92	12.790	10.605	99	1.984	S*
		62.80	10.472				
	Day 3 versus day 5	62.80	10.472	1.862	99	1.984	NS
		61.05	7.697				
	Day 1 versus day 5	76.92	12.790	11.562	99	1.984	S*
		61.05	7.697				
Respiration	Day 1 versus day 3	31.52	3.566	38.116	99	1.984	S*
		19.86	2.535				
	Day 3 versus day 5	19.86	2.535	−0.041	99	1.984	NS
		19.87	2.956				
	Day 1 versus day 5	31.52	3.566	28.757	99	1.984	S*
		19.87	2.956				

* 1.984

Table 8: Effectiveness of effleurage back massage therapy on pain and physiological parameter systolic blood pressure and diastolic blood pressure

Parameters	Days	Groups	Pre-test						Post-test					
			Mean	S.D	C. value	D.F	T. values	Significance	Mean	S.D	C. value	D.F	T. values	Significance
Blood pressure systolic	Day 1	Experimental group	136.54	11.998	2.225	198	1.972	S*	126.24	13.389	6.097	198	1.972	S*
		Control group	133.01	10.379					137.02	11.547				
	Day 3	Experimental group	128.70	13.822	1.036	198	1.972	NS	120.79	10.734	9.589	198	1.972	S*
		Control group	130.55	11.312					134.10	8.801				
	Day 5	Experimental group	120.08	10.365	1.659	198	1.972	NS	112.06	10.823	8.742	198	1.972	S*
		Control group	122.81	12.782					126.40	12.327				
Blood pressure diastolic	Day 1	Experimental group	76.92	12.790	1.813	198	1.972	NS	65.34	11.864	6.811	198	1.972	S*
		Control group	73.97	10.053					76.81	11.953				
	Day 3	Experimental group	74.52	12.108	0.817	198	1.972	NS	62.80	10.472	9.587	198	1.972	S*
		Control group	75.89	11.607					78.41	12.469				
	Day 5	Experimental group	72.82	7.633	0.468	198	1.972	NS	61.05	7.697	14.262	198	1.972	S*
		Control group	73.39	9.493					78.13	9.175				

S: Significant at 0.05 level of significance at *P*<0.05, NS: Not significant at 0.05 level of significance

table value 1.984. Table 10 shows that NS and respiration BP day 3 versus day 5 and day 1 versus day 5 calculated "*t*" = 0.050 are less then table values 1.984 at degree is 99. It shows that there is NS:

As per Table 11 analysis data are clearly show that the level pain difference among post-operative clients with effleurage back massage whereas DBP day 3 versus day 5 and respiratory BP day 3 versus day 5 and day 1 versus day 5 has no difference among post-operative clients with effleurage back massage in the control group.

Section-III

Ho3: There will be NS difference in the pre- and post-test values of pain and physiological parameters among post-operative clients in the experimental and control group on day 1, day 3, and day 5.

Pain

Day 1, day 3, and day 5 in pre-test, the calculated "*t*" value for the experimental and control groups much lesser than the table value, hence, there was no difference in pretest pain levels among post-operative clients of experimental and control groups at P < 0.05.

In the post-test, the calculated "*t*" value for the experimental and control groups pain levels was much higher than table value, hence, it is inferred that the clients in the experimental group have experienced lesser pain level compared to that of clients in the control group at *P* < 0.05 [Tables 12 and 13].

Pulse

Day 1 and day 5 in pre-test, the calculated "*t*" value for the experimental and control groups much lesser than the table value, hence, there was difference in pre-test whereas day 3 no difference pain levels among post-operative clients of the experimental and control groups at *P* < 0.05.

In the post-test, the calculated "*t*" value for the experimental and control groups pain levels was much higher than table value, hence, it is inferred that the clients in the experimental group have experienced lesser pain level compared to that of clients in the control group at *P* < 0.05.

Table 9: Comparison of post-test scores of pain and physiological parameters between day 1 versus day 3, day 3 versus day 5, and day 1 versus day 5 in the control group. $n=100$

Parameters	Days	Mean	SD	calculated Value	Df	Table value	Significance
Pain	Day 1 versus day 3	9.44 7.16	1.057 1.594	16.281	99	1.984	S*
	Day 3 versus day 5	7.16 4.80	1.594 2.445	10.751	99	1.984	S*
	Day 1 versus day 5	9.44 4.80	1.057 2.445	19.354	99	1.984	S*
Pulse	Day 1 versus day 3	104.29 115.23	24.393 10.256	−4.700	99	1.984	S*
	Day 3 versus day 5	115.23 109.53	10.256 11.277	5.071	99	1.984	S*
	Day 1 versus day 5	104.29 109.53	24.393 11.277	−1.940	99	1.984	S*
SBP	Day 1 versus day 3	133.01 134.10	10.379 8.801	−1.241	99	1.984	S*
	Day 3 versus day 5	134.10 126.40	8.801 12.327	5.315	99	1.984	S*
	Day 1 versus day 5	133.01 126.40	10.379 12.327	5.404	99	1.984	S*
DBP	Day 1 versus day 3	73.97 78.41	10.053 12.469	−3.198	99	1.984	S*
	Day 3 versus day 5	78.41 78.13	12.469 9.175	0.229	99	1.984	NS
	Day 1 versus day 5	73.97 78.13	10.053 9.175	−4.121	99	1.984	S*
Respiration	Day 1 versus day 3	27.59 28.67	4.615 4.358	−1.941	99	1.984	S*
	Day 3 versus day 5	28.67 27.86	4.358 4.238	1.653	99	1.984	NS
	Day 1 versus day 5	27.59 27.86	4.615 4.238	−0.450	99	1.984	NS

*1.984

Table 10: Effectiveness of effleurage back massage therapy on pain and physiological parameter between the experimental and control groups

Parameters	Days	Groups	Pre-test						Post-test					
			Mean	S.D	C. value	D.F	T. values	Significance	Mean	S.D	C. value	D.F	T. values	Significance
Pain	Day 1	Experimental group	9.40	0.816	0.299	198	1.972	NS	4.88	1.559	18.103	198	1.972	S*
		Control group	9.44	1.057					8.12	0.879				
	Day 3	Experimental group	7.76	1.120	0.523	198	1.972	NS	2.21	0.891	27.111	198	1.972	S*
		Control group	7.68	1.043					7.16	1.594				
	Day 5	Experimental group	5.04	0.665	1.450	198	1.972	NS	1.09	0.321	15.043	198	1.972	S*
		Control group	5.33	1.886					4.80	2.445				
Pulse	Day 1	Experimental group	113.04	14.315	3.094	198	1.972	S*	103.90	13.997	3.228	198	1.972	S*
		Control group	104.29	24.393					111.72	19.768				
	Day 3	Experimental group	113.39	16.059	1.705	198	1.972	NS	104.26	16.409	5.669	198	1.972	S*
		Control group	110.05	11.223					115.23	10.256				
	Day 5	Experimental group	108.86	14.648	2.309	198	1.972	S*	99.59	13.971	5.536	198	1.972	S*
		Control group	104.45	12.257					109.53	11.277				

*1.972

Table 11: Effectiveness of effleurage back massage therapy on physiological parameter respiratory rate

Parameters	Days	Groups	Pre-test						Post-test					
			Mean	S.D	C. value	D.F	T. values	Significance	Mean	S.D	C. value	D.F	T. values	Significance
Respiration	Day 1	Experimental group	31.52	3.566	6.739	198	1.972	S*	23.91	4.043	14.810	198	1.972	S*
		Control group	27.59	4.615					30.98	2.539				
	Day 3	Experimental group	27.15	2.645	4.746	198	1.972	S*	19.86	2.535	17.475	198	1.972	S*
		Control group	24.22	5.579					28.67	4.358				
	Day 5	Experimental group	26.26	3.860	2.196	198	1.972	S*	19.87	2.956	15.463	198	1.972	S*
		Control group	24.82	5.300					27.86	4.238				

S: Significant at 0.05 level of significance at *P*<0.05, NS: Not significant at 0.05 level of significance

Table 12: Association of post-test pain score with selected demographic variables with the experimental group, *n*=100

Demographic variables	Mild	Moderate	Severe	Chi-square	Df	Table value	Significant
Age in years							
30–40	15	0	0	2.323	2	5.991	NS
40–50	36	1	0				
50–60	44	4	0				
Gender							
Male	67	5	0	2.047	1	3.841	NS
Female	28	0	0				
Type of surgery							
Cardiothoracic	66	1	0	5.258	1	3.841	S*
Abdominal	29	4	0				
Grade the intensity of pain							
None	0	0	0	1.155	1	3.841	NS
Mild	0	0	0				
Moderate	18	0	0				
Severe	77	5	0				

S: Significant at 0.05 level of significance at *P*<0.05, NS: Not significant at 0.05 level of significance

Table 13: Association of post-test pain score with selected demographic variables with the control group, *n*=100

Demographic variables	Mild	Moderate	Severe	Chi-square	Df	Table value	Significant
Age in years							
30–40	7	21	9	2.919	4	8.715	NS
40–50	13	18	6				
50–60	6	15	5				
Gender							
Male	14	22	9	1.218	2	5.991	NS
Female	12	32	11				
Type of surgery							
Cardiothoracic	15	45	16	6.545	2	5.991	S*
Abdominal	11	9	4				
Grade the intensity of pain							
None	0	0	0	8.296	2	5.991	S*
Mild	0	0	0				
Moderate	5	1	1				
Severe	21	53	19				

S: Significant at 0.05 level of significance at *P*<0.05, NS: Not significant at 0.05 level of significance

SBP

Day 3 and day 5 in pre-test, the calculated *"t"* value for the experimental and control groups much lesser than the table value, hence there was difference in pretest whereas day 1 calculated value is higher than table value has difference pain levels among post-operative clients of experimental and control groups at P < 0.05.

In the post-test, the calculated "*t*" value for the experimental and control groups pain levels was much higher than table value, hence, it is inferred that the clients in the experimental group have experienced lesser pain level compared to that of clients in the control group at *P* < 0.05.

DBP

Day 1, Day 3 and Day 5 in pre-test, the calculated *"t"* value for experimental and control groups much lesser than the table value, hence there was no difference in pretest among post-operative clients of experimental and control groups at

$P < 0.05$.

In the post-test, the calculated "t" value for the experimental and control groups pain levels was much higher than table value, hence, it is inferred that the clients in the experimental group have experienced lesser pain level compared to that of clients in the control group at $P < 0.05$.

Respiration

Day 1, Day 3 and Day 5 in pre-test and post - test, the calculated "t" value for experimental and control groups much higher table value, hence there was difference in pretest among post-operative clients of experimental and control groups at $P < 0.05$.

Section IV
Part-A

Ho4: There will be NS association between the post-test levels of pain with selected demographic variables in the experimental group.

Age, gender, and grade the intensity of pain the calculated Chi-square values are lesser than table values at degrees of freedom, P > 0.05 level of significance, it shows that there is NS association between post-test levels whereas type of surgery, Chi-square value is 5.258 higher than table value 3.841 at degrees of freedom, P > 0.05 level of significance, it shows that there is significant association between post–tests levels of pain.

In the present study, the Chi-square test values have shown that there was no association between the post-test pain levels of sample and selected demographic variables such as age, gender, and intensity of pain except for type of surgery. Hence, null hypothesis H03 is accepted.

There was significant association between post-test levels of pain and type of surgery among post-operative clients. Hence, null hypothesis H03 is rejected.

Part-B

Ho5: There will be NS association between the post-test levels of pain with selected demographic variables in control group.

Age and gender were in the intensity of pain; the calculated Chi-square values are lesser than table values at degrees of freedom, $P > 0.05$ level of significance, it shows that there is NS association between post-test levels whereas type of surgery and grade the intensity of pain, Chi-square values were higher than table value at degrees of freedom, $P > 0.05$ level of significance, it shows that there is significant association between post-tests levels of pain.

In the present study, the Chi-square test values have shown that there was no association between the post-test pain levels of sample and selected demographic variables such as age and gender. Hence, null hypothesis H03 is accepted.

There was significant association between post-test levels of pain and intensity of type of surgery and grade the intensity of pain among post-operative clients. Hence, null hypothesis H03 is rejected.

DISCUSSION, FINDINGS, AND CONCLUSION
Discussion

Adib-Hajbaghery *et al*. (2012) conducted a randomized controlled trial to examine the effects of effleurage massage therapy on cardiac surgery patients' vital signs, Kashan. The samples were 60 hospitalized clients in cardiac units. In the intervention group, massage therapy was done on the 2nd post-operative day. The control group only received the routine care. Vital signs were recorded before and after the massage therapy session; the pre-intervention mean of SBP of the intervention group was 126.0 ± 16.80 and changed to 121.70 ± 13.31 after the massage therapy session. 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 effleurage massage ($P = 0.001$); hence, there are NS changes in DBP and temperature of the intervention group and there were NS changes in vital signs of the control group. The study recommended that massage therapy can be used to balance vital signs of patients admitted in post-operative ward anxiety. In addition, patients in the massage group experienced a faster rate of decrease in pain intensity ($P = 0.02$) and unpleasantness ($P = 0.01$) during the first 4 post-operative days compared with the control group. There was no difference in the anxiety, length of stay, opiate use, or complications across the three groups. The study concluded that massage is an effective and safe adjuvant therapy for the relief of acute post-operative pain in patients after major operations.[10,11]

Findings of the study
Findings related to description of sample characteristics

Data were collected from 200 post-operative clients who are undergone surgeries on cardiothoracic and abdominal regions. The aim of the study was to assess the effectiveness of effleurage back massage on pain and physiological parameters among post-operative clients.

According to Braun *et al*. (2012) study to assess the effectiveness of effleurage back massage on post-operative cardio thoracic surgical clients, majority of the samples, that is, 67% from the experimental group and 82% from the control group were of 60 years age.[12]

Regarding the gender of the post-operative clients, out of 72% samples, majority of the samples were males in the experimental group, and in the control group, majority of the sample. About 55% were female.

According to Piotrowski *et al*. (2003) conducted a study to assess the pain in post-operative clients. In this study, majority of the sample, that is, 195 (96.5%) were male.[13]

Regarding the type of the surgery, majority of the i.e. from experimental group 67% and control group 76% have had cardio thoracic surgeries. Regarding the grade of intensity of pain, the majority of the post-operative clients, that is, 82% experienced severe pain from experimental and 87.5% control group, respectively, in pre-test.

Hinshaw *et al*. (2006) conducted a randomized controlled trial to assess the effectiveness of effleurage back massage on pain management and post-operative anxiety among post-operative pain at Affairs Hospitals in Ann Arbor, Indiana. The samples were 605 mean age 64 years undergoing major surgeries. Patients were assigned to the three groups like control (routine care), individualized attention from a massage therapist for 20 min, and back massage by a massage therapist each evening in up to 5 post-operative days. Compared with the control group, patients in the massage group experienced short-term decreases in pain intensity ($P = 0.001$), pain unpleasantness ($P < 0.001$), and anxiety ($P = 0.007$). Patients experienced a faster rate of decrease in pain intensity ($P = 0.02$) and unpleasantness ($P = 0.01$) during the first 4 post-operative days compared with the control group.[14]

The calculated "*t*" values from day 1, day 3, to day 5, that is, 18.1, 27.1, to 15.04, respectively, much higher than table values, that is, 2.00, hence, it is inferred that the effleurage back massage is effective in alleviating the pain among post-operative clients in the experimental group, when compared to the control group.

Walton (2009) conducted a comparative study on effleurage back massage on physiological and psychological relaxation at St. John's College of Nursing, Bengaluru. Data were obtained from 60 adult clients who were confined to bed in orthopedic wards. The physiological parameters – SBP, DBP, HR, and RR were checked before effleurage back massage and at 5 min and 30 min after effleurage back massage. Further, there was significant change in BP, HR, and RR following effleurage back massage at 0.001 level. The psychological parameters were measured only twice, pre-massage and at 30 min post-massage. There was significant change in pain level and anxiety level following effleurage back massage at 0.001 level. The calculated "*t*" value for pulse rate on day 1 and day 5 is 2.00 and 1.84, respectively, which is lesser than the table values of 2.00 at p<0.05 and 58 degrees of freedom. Although on day 3, the calculated "*t*" value 2.6 was slightly higher than the table value 2.00, it is inferred that the effleurage back massage could not effectively maintain pulse rate within normal limits.[15]

The calculated "*t*" value for SBP on day 1, day 3, and day 5 is 6.09, 9.5, and 8.7, respectively, which is higher than the table values of 1.9 at $P < 0.05$ and 198 degrees of freedom. Hence, it is inferred that the effleurage back massage could improve the SBP and was not similar to that of control group. The calculated "*t*" value for DBP on day 1, day 3, and day 5 was 6.8, 9.5, and 14.2, respectively, which was higher than the table values of 1.9 at $P < 0.05$ and 198 degrees of freedom. Hence, it is inferred that the effleurage back massage could maintain the DBP within normal limits and that the readings were not similar to that of the control group.

The calculated "*t*" values for respiratory rate on day 1 and day 3 were 14.8, 17.4, and 15.4, respectively, which are higher than the table value of 1.97 at $P < 0.05$ and 198 degrees of freedom. After considering the overall values, it is inferred that the effleurage back massage could maintain respiratory rate had difference in pre-test among post-operative clients of the experimental and control group.

Association of post-test pain score with selected demographic variables in the experimental group

Age – the calculated Chi-square value 2.323 was lesser than table value 5.99 at 2 degrees of freedom, $P > 0.05$ level of significance, it shows that there is NS association between post-test levels of pain and age.

Gender – the calculated Chi-square value 2.047 was lesser than table value 3.84 at 1 degree of freedom, $P > 0.05$ level of significance which shows that there is NS association between post-test levels of pain and gender.

Type of the surgery – the calculated Chi-square value 5.258 was higher than table value 3.84 at 1 degree of freedom, $P < 0.05$ level of significance which shows that there is significant association between post-test levels of pain and type of surgery.

Intensity of pain – the calculated Chi-square value 1.155 was lesser than table value 3.84 at 1 degree of freedom, $P > 0.05$ level of significance which shows that there is NS association between post-test levels of pain and intensity of pain.

In the present study, the Chi-square test values have shown that there was no association between the post-test pain levels of sample and selected demographic variables such as age, gender, and intensity of pain except for type of surgery.

There was significant association between post-test levels of pain and type of surgery among post-operative clients.

Association of post-test pain score with selected demographic variables in the control group

Age – the calculated Chi-square value 2.91 was lesser than table value 8.7 at 4 degrees of freedom, $P > 0.05$ level of significance, it shows that there is NS association between post-test levels of pain and age.

Gender – the calculated Chi-square value 1.218 was lesser than table value 5.99 at 2 degree of freedom, $P > 0.05$ level of significance which shows that there is NS association between post-test levels of pain and gender.

Type of the surgery – the calculated Chi-square value 6.545 was higher than table value 5.99 at 2 degree of freedom, $P > 0.05$ level of significance which shows that there is significant association between post-test levels of pain and type of surgery.

Intensity of pain – the calculated Chi-square value 8.296 was higher than table value 5.99 at 2 degree of freedom, $P < 0.05$ level of significance which shows that there is significant association between post-test levels of pain and intensity of pain.

In the present study, the Chi-square test values have shown that there was no association between the post-test pain levels of sample and selected demographic variables like age and there is significant among type of surgery and intensity of pain.

There was significant association between post-test levels of pain and intensity of pain among post-operative clients.

Conclusion

Data were collected from 100 post-operative clients admitted in Medicover Hospital, Visakhapatnam, to determine the effectiveness of effleurage back massage on post-operative clients to reduce the pain and physiological parameters. The experimental group sample received effleurage back massage twice in a day from 1st post-operative day to 5th post-operative day, levels were analyzed, in the control group, sample not given effleurage back massage, levels were analyzed. The control group values did not show an significant difference between pre-test and post-test. The experimental group values pain was significant difference between pre-test and post-test. Physiological parameters not significant.

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Conflicts of Interest

There are no conflicts of interest.

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