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An Experimental Study to Assess the Effectiveness of Progressive Muscle Relaxation Technique on Post-Operative Pain Management in Patients Undergoing Abdominal Surgery in Silchar Medical College and Hospital, Silchar, Assam

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Abstract:
Background: Effective pain management is essential in the post-operative period to ensure that patients do not experience unnecessary distress or suffering and to minimize potential complications. One of the most simple and easy learned techniques for relaxation is progressive muscle relaxation (PMR) technique. Aim: This study aims to assess the effectiveness of PMR technique on post-operative pain management in patients undergoing abdominal surgery in Silchar Medical College and Hospital, Silchar, Assam. Materials and Methods: A quasi-experimental, pretest-post-test control group design was selected for the study. Convenient sampling technique was used to select 40 patients in the experimental and control groups by simple randomization. Analysis and interpretation: Results: The findings of the study revealed that on pre-test assessment, it was observed that in day 1, majority of patients had moderate pain both in the experimental and control groups, that is, 90% and 85%, respectively. In day 2 also, majority of patients in both the experimental group and control group had moderate pain, that is, 75% and 65%, respectively. In day 3, majority of patients had mild pain in both the experimental group and control group, that is, 95% and 85%, respectively. Conclusion: It can be concluded that PMR technique was effective in reducing level of post-operative pain on the 1st and 2nd post-operative days after abdominal surgery.

Introduction

Pain is a complex, multidimensional experience. It is a major problem that causes suffering and reduces quality of life. Pain is one of the major reasons that people seek health care. The International Association for the Study of Pain (IASP) defines pain as “an unpleasant sensory and emotional

experience associated with actual or potential tissue damage, or described in terms of such damage"(Lewis 2011)[1].

Many factors are known to affect the experience of pain, including gender, age, culture, previous experiences, the meaning the pain has to the individual experiencing it, tempered with a range of psychological factors, the most predominant of which is individual coping skills (Mackintosh C 2007)[2].

The term abdominal surgery broadly covers surgical procedures that involve opening the abdomen. Diseases affecting the abdominal cavity are dealt with generally under their own names (e.g. appendicitis).

Postoperative pain is an acute pain beginning with surgical trauma, tapering off gradually and ending with tissue recovery. In spite of the development of new pain control methods and medication and the adoption of guidelines for pain care by many hospitals, post-operative pain is still a problem for many patients. According to current pain-related studies, more than 75% of patients experience pain after surgery, about 40%–80% of patients experience moderate to severe pain, and as many as 40%–50% of patients do not receive proper post-operative pain management. Improper pain control not only increases the burden of many organs, but also limits the patient's activity, increases post-operative morbidity, affects physical recovery and the patient's emotional state after surgery, and is more likely to extend the length of stay and medical costs (Arslan & Çelebioğlu 2004)[3].

One of the most simple and easy learned techniques for relaxation is progressive muscle relaxation (PMR) a widely used procedure today that was developed by Jacobson in the year 1930.Progressive muscle relaxation (PMR) involves the tensing and relaxing the muscles. The use of this tension/relax method is intended to help differentiate between when a muscle is tensed and when it is relaxed. This recognition will allow an individual to reduce muscle tension when it occurs during stress. PMR is based on the principle that when the muscles are relaxed, the mind will relax. Typically a session of PMR will begin at the extremities and gradually move across the whole body (Lewis 2011)[1]

Need of the study:

Pain has long been recognised as a highly personal and subjective phenomenon unique to the individual. Pain has always been linked with surgical intervention. Pain may occur because of the pre-existing disease that led to the need for an operation, the surgical procedure itself with the associated trauma, instrumentation or complication or a combination of both the disease process and the intervention.

Post-operative pain is an acute pain beginning with surgical trauma, tapering off gradually and ending with tissue recovery. The pain experienced by the post operative patients in hospital settings is one of the most common clinical situations encountered by a nurse. Nurses have direct responsibility for the provision of measures to relieve pain.

Over the past 30 years, several studies have identified poor clinical practice in the assessment and management of post-operative pain. Although the numbers of patients who complain about levels of post-operative pain remains low, this failing is an issue of concern.

Carolyn Mackintosh[2] said thatinadequate assessment and management of post-operative pain can have profound effects on the patient, causing raised levels of anxiety, sleep disturbances and mobilisation difficulties, restlessness, irritability, aggression, and perhaps most importantly, unnecessary levels of distress and suffering. Poorly assessed and managed post-operative pain can also have physiological effects on patients, which may lead to complications and delayed discharge, including increases in heart rate and blood pressure, delayed gastric emptying resulting in nausea, vomiting and paralytic ileus, and

changes in the endocrine system as a result of increased adrenaline production. Failure to cough and deep breath as a result of poorly controlled pain can result in the development of chest infections, delay in mobilisation and additional problems, such as deep vein thrombosis, and pulmonary embolus. Accurate assessment of post operative pain is essential to ensure that pain is managed effectively. Without assessment it is impossible to identify the nature of pain, the individual characteristics of pain or to gauge the effectiveness of pain management interventions.

There are two main approaches that can be used when managing post-operative pain; the use of pharmacological interventions and comfort measures. These approaches work best when used together, although there is a tendency in clinical practice to minimise the importance of comfort measures and emphasise the importance of pharmacological and technological interventions.

Both nursing and medicine have gradually adopted the primary assumption that essentially it is the body that becomes sick; the mind may usually be secondarily involved. In holistic approach to patient care, the mind and the body are seen as operating on a continuum. The challenge for nurses is to help patients to understand about the body and mind which are interconnected and that mind therapies used in conjunction with traditional medical therapies can hasten the healing process.

Carr and Thomas (1997) observed that all patients expect postoperative pain. It is reported that 46 million people undergo surgery each year in the USA, of whom 77% experience postoperative pain. Kuhn et al. (1990), in their study of 101 patients, found that 40 of them suffered from severe pain and 47 experienced moderate pain. Seventy-five percent of patients undergoing surgery report that they endure moderate to severe pain which on movement causes very severe pain, reaching 85%-100%. In Turkey, 93.7% of the patients undergoing surgery report that they suffer from severe pain.

Kuhn et.al described that abdominal surgeries are one of the most painful surgical procedures, due to the proximity to the diaphragm and the nerve supply to the area, and 37% of the patients undergoing elective abdominal surgery report that they experience severe pain.

Bonica and Benedetti[5] (1983)estimated that 5% to 20% of patients have minimal pain, 25% to 40% experience moderate pain and the remaining 40% to 70% suffer from severe pain after a major abdominal surgery.

Paula, et al.[6] (2002) had conducted a study with the purpose of testing the effect of a specific intervention (Progressive Muscle Relaxation) in a determined situation (pain). This study aimed at verifying the level of pain in post surgical patients prior and after progressive muscle relaxation technique. 61 patients who underwent abdominal surgical interventions practiced progressive muscle relaxation technique. There was a significant alterations in vital parameters (pulse, respiration, blood pressure) as well as muscular alterations which enabled the subjects to determine that their pain levels decreased.

Good and his research team[7] have done a study on both medications and self care methods which involved patient's participation for relief of pain. The study was done on three groups of patients undergoing abdominal surgery. In addition to the usual pain medication one group had used jaw relaxation technique, another group listened to music and third group received combination of relaxation and music. Findings revealed that, after surgery, the three groups had significant reduction in pain than the control group, which received only pain medication.

Iclin[8] reported that complementary and alternative therapies such as massage, yoga, relaxation techniques, meditation and many other well documented techniques relieve pain and stress after a surgery in the post operative period.

The relaxation technique is a participant exercise in which the individual himself seeks a state of relaxation and physical well being. The relaxed patients acquire a quicker recovery from the disease. This leads to a cost effective and less expensive hospitalization and less sufferings to the clients.As studies have shown pain is a major health problem of post-operative patients and it deteriorates the quality of life of the patients. Nurses have got a pivotal role in eliminating stress, reducing the pain, and improving the condition of post operative patients. Nurses should encourage the patient to use different pain management technique.

During the clinical posting the investigator observed that post-operative patients lack knowledge regarding progressive muscle relaxation technique to reduce pain.It was also found that no study has been conducted on effectiveness of progressive muscle relaxation in entire North- East region. Therefore the investigator felt to conduct a study to assess the effectiveness of progressive muscle relaxation technique on pain management in patients undergoing abdominal surgery in GMCH, Guwahati, Assam.

Statement of the problem:

An experimental study to assess the effectiveness of progressive muscle relaxation technique on post-operative pain management in patients undergoing abdominal surgery in Silchar Medical College and Hospital, Silchar, Assam.

Objectives of the study:

1. To assess the level of pain in patients undergoing abdominal surgery.
2. To determine the effectiveness of progressive muscle relaxation technique on pain management in patients undergoing abdominal surgery.

Assumptions:

- Patients who have undergone abdominal surgery will have moderate to severe pain.
- Patients will be co-operative.
- Patients treated with progressive muscle relaxation technique will have influence on level of post-operative pain.

Hypotheses:

H_{01}: There is no significant difference between level of mean pain score in experimental and control group.

Delimitations:

The study is delimited to

- The patients who had undergone abdominal surgery in Gauhati Medical College and Hospital, Guwahati during the data collection period.
- The data collection period is limited to 5 weeks.
- The study sample size will be 40 selected post-operative patients (20 in experimental group, 20 in control group)

Materials and methods

Research approach: Evaluative research approach was selected for the present research study, as it was found to be most suitable for studying the problem under study.

Research Design: In the present study , quasi experimental research design was used to observe the effectiveness of progressive muscle relaxation on pain management in patients undergoing abdominal surgery.

The pre test post test control group design was selected by the researcher to measure the effects of treatment over long period of time. In this research study, time series research design was adapted to observe the effectiveness of progressive muscle relaxation on pain management for a period of 3 days successively. The research design for the present study has been given below:

Table 1: Schematic diagram for research design:

Sample	Day 1			Day 2			Day 3		
Experimental group	O_1	X_1	O_2	O_3	X_2	O_4	O_5	X_3	O_6
Control group	O_1		O_2	O_3		O_4	O_5		O_6

O_1- Pre-assessment of level of pain in 1st post-operative day.
O_2- Post-assessment of level of pain in 1st post-operative day.
O_3- Pre-assessment of level of pain in 2nd post-operative day.
O_4- Post-assessment of level of pain in 2nd post-operative day.
O_5- Pre-assessment of level of pain in 3rd post-operative day.
O_6- Post-assessment of level of pain in 3rd post-operative day.
X_1- Progressive muscle relaxation technique provided in the 1st day
X_2- Progressive muscle relaxation technique provided in the 2nd day
X_3- Progressive muscle relaxation technique provided in the 3rd day

Setting :

The main study was conducted in the general surgical wards of GMCH, Guwahati, Assam after obtaining approval from the Institutional Ethical Committee.

Population:

In this study the selected target population was the post-operative patients who underwent elective open abdominal surgery and were admitted in general surgery wards in Silchar Medical College and Hospital, Silchar, Assam.

Sample size:

40 post-operative patients with elective open abdominal surgery who were admitted in the general surgery wards in Silchar Medical College and Hospital, Silchar, Assam.

Sampling technique:

The technique that was adopted for the present study was convenient sampling method. Simple randomi

zation was used to allot the samples in experimental and control group. Lottery method was conducted by pulling the card to prevent bias in selecting intervention group.

Criteria for sample selection:

Inclusion criteria

a. Patients who were subjected for elective abdominal surgery
b. Patients who were (male and female) in the age group of 20 to 60 yrs.
c. Patients who were willing to participate.
d. Patients who were able to communicate in Bengali, Assamese, Hindi or English.
e. Patients who were receiving inj. Diclofenac 75 mg BD.

Exclusion Criteria

a. Patients who developed post operative complications such as peritonitis, post-operative haemorrhage, mild atelectasis, fever etc.
b. Patients who were posted for emergency abdominal surgery.

Variables:

In the present study:

Independent variable: Progressive muscle relaxation technique administered to the patients undergoing abdominal surgery.

Dependent variable: level of pain.

Tool :

Development of the tool:

It was evident from the literature review that because of the nature of the type of data required to be analysed to assess the level of pain of the patients undergoing abdominal surgery, standardized tools are essential. After an extensive literature search and examining the tools available, the standardized tool Numerical pain rating scale was selected or procured for the present study.

Tool consists of 3 parts:

Section I: Consisted of self structured interview schedule developed by the investigator to collect the demographic variables like age, sex, education, occupation, religion marital status and other selected variables like type of anaesthesia, type of surgery, and family support.

Section II: Consisted of numerical pain rating scale which is a self administered standardized tool which has 10 cm baseline as per the recommendations. The subjects were asked to rate the pain on the numerical pain rating scale. The pain score has been classified into the following- 'no pain' (0), 'mild pain' (1-3) 'moderate pain' (4-6), 'severe pain' (7-10).

Section III: Consisted of pre and post test assessment of physiological parameters like pulse, respiration and blood pressure.

Reliability of the tool:

Reliability of the structured interview schedule was found to be 0.801 which indicated that the tool was reliable.

Ethical consideration:

- Permission was obtained from the Institutional ethical Committee.
- Verbal and written consent was obtained from all the participants of the study after explaining the purpose and other details of the study.

Data collection procedure:

After administrative approval from the concerned authority was obtained, the study was conducted on Silchar Medical College and Hospital, Silchar, Assam, from from 1st July 2024 to 30th July 2024.
The purpose of the study was explained to patients and written consent was obtained from the study participants. After selecting the sample patients of the study by convenient method, lottery was done to randomly select the experimental and control group. One day prior to the surgery progressive muscle relaxation technique was taught and verbal instruction was given for the experimental samples. Pretest level of pain was assessed and progressive muscle relaxation was given as intervention for three consecutive post operative days starting from the first post-operative day and post test was conducted every day in both. Progressive muscle relaxation was given for 15 minutes and post test was conducted after 1 hour.

Analysis and Interpretation:

Analysis of data for the present study was based on the objectives and by using descriptive and inferential statistics. The statistical package for the social sciences (SPSS) was utilized to analyse the data. After the task of data collection, the master data sheet was prepared from the raw data before entering the data to SPSS.

Presentation of data:

The findings of the study are discussed in the following section.
Section I: Distribution of samples according to selected variables in experimental and control group.
Section II: Assessment of level of pain in patients undergoing abdominal surgery.
Section III: Determination of the effectiveness of progressive muscle relaxation technique on pain management in patients undergoing abdominal surgery.
Section IV: Assessment of association between the level of pain and selected variables in the experimental group on day 1.
Section V: Assessment of correlation between physiological parameters like pulse, respiration and blood pressure and level of pain in experimental group on day 1.

Section I: Distribution of samples according to selected variables in the control and experimental group.

Table 1.1: **Distribution of samples according to age.**
n=40(Experimental group= 20, Control group= 20)

Sample characteristics		**Experimental**		**Control**	
		Frequency	**%**	**Frequency**	**%**
Age (in years)	20- 30	7	35.00	7	35.00
	31- 40	8	40.00	7	35.00

	41- 50	4	20.00	5	25.00
	51-60	1	5.00	1	5.00

Table 1.1portrays the distribution of samples according to their age. It was observed that, in experimental group majority of patientsi.e40% were in the age group of 31-40 years, 35% were in the age group of 20-30 years of age group, 20% were in the age group of 41-50 years and 5% were in the age group of 51-60 years.
On the other hand, in control group majority of patients i.e35% were in the age group of 20-30 years and 31-40 years, 25% patients were in age group of 41-50 years and 5% of patients were in the age group of 51-60 years.

Table 1.2: Distribution of sample according to sex
n=40(Experimental group= 20, Control group= 20)

Sample characteristics		**Experimental group**		**Control group**	
		Frequency	**%**	**Frequency**	**%**
Sex	Male	10	50.00	10	50.00
	Female	10	50.00	10	50.00

From table1.2 it can be interpreted that equal numbers (50%) of male and female patients were found in both the experimental and control group.

Table 1.3: Distribution of sample according to education
n=40(Experimental group= 20, Control group= 20)

Sample characteristics		**Experimental group**		**Control group**	
		Frequency	**%**	**Frequency**	**%**
Education	Illiterate	5	25.00	5	25.00
	Primary	5	25.00	7	35.00
	High School	7	35.00	3	15.00
	Higher Secondary	2	10.00	5	25.00
	Graduate and above	1	5.00	0	0

Table 1.3 shows that in experimental group, majority of patients i.e 35% had high schooling, 25% were illiterate, 25% had primary education, 10% had higher secondary education and only 55 were graduate and above. In control group, majority of patients i.e 35% had primary education, 25% were illiterate, 25% had higher secondary education and 15 % had high schooling.

Table 1.4: Distribution of sample according to occupation
n=40(Experimental group= 20, Control group= 20)

Sample characteristics		**Experimental group**		**Control group**	
		Frequency	**%**	**Frequency**	**%**
Occupation	Govt. employee	-	-	-	-

	Non govt. employee	-	-	2	10.00
	Business	2	10.00	3	15.00
	Self employed	6	30.00	4	20.00
	Unemployed/Student/housewife	12	60.00	11	55.00

The table1.4 shows that among the experimental group, majority (60%) of patients were unemployed, student or housewife, 30% of patients were self employed and 10% were businessman. Also among the control group, majority(55%) of patients were unemployed, student or housewife, 20% were self employed, 15% had business and 10% were non govt. Employee.

Table 1.5 : Distribution of sample according to religion

n=40(Experimental group= 20, Control group= 20)

Sample characteristics		**Experimental group**		**Control group**	
		Frequency	**%**	**Frequency**	**%**
Religion	Hindu	13	65	12	60
	Islam	7	35	8	40
	Others	0	0	0	0

Table 1.5 depicts that among the experimental group 65% patients were Hindu and 35% were Islam people. Among the Control group 60% were Hindu and 40% were Islam people.

Table1.6: Distribution of sample according to marital status

n=40(Experimental group= 20, Control group= 20)

Sample characteristics		**Experimental group**		**Control group**	
		Frequency	**%**	**Frequency**	**%**
Marital Status	Married	14	70	15	75
	Unmarried	5	25	4	20
	Divorced	0	0	0	0
	Widow/widower	1	5	1	5

Table 1.6 shows that among the experimental group, majority i.e 70% were married, 25% were unmarried and 5% were widow/widower. Among the control group also, majority of patientsi.e 75% were married, 20% were unmarried and 5% were widow/widower.

Table 1.7: Distribution of sample according to type of anaesthesia

n=40(Experimental group= 20, Control group= 20)

Sample characteristics		**Experimental group**		**Control group**	
		Frequency	**%**	**Frequency**	**%**
Type of anaesthesia	General	20	100	20	100
	Spinal	0	0	0	0

From table 1.7, it is observed that in both experimental and control group, all the patients had undergone surgery under general anaesthesia.

Table 1.8: Distribution of sample according to type of surgery

n=40(Experimental group= 20, Control group= 20)

Sample characteristics		**Experimental group**		**Control group**	
		Frequency	**%**	**Frequency**	**%**
Type of surgery	Appendectomy	4	20	6	30
	Cholecystectomy	13	65	11	55
	Hernioplasty	3	15	3	15
	Gastrectomy	0	0	0	0

Above table1.8 shows that in the experimental group, majority of patients i.e 65% undergone cholecystectomy, 20% undergone appendicectomy and 15% undergone hernioplasty.
In the control group, 55% undergone cholecystectomy, 30% undergone appendicectomy and 15% undergonehernioplasty.

Table 1.9: Distribution of sample according to family support

n=40(Experimental group= 20, Control group= 20)

Sample characteristics		**Experimental group**		**Control group**	
		Frequency	%	Frequency	%
Family support	Supportive	20	100	20	100
	Non supportive	0	0	0	0

From table 1.9, it is observed that all the patient's family in both experimental and control group were supportive.

Section II: Assessment of level of pain in patients undergoing abdominal surgery

Table 2.1: Assessment of pre-test level of pain

n=40(Experimental group= 20, Control group=20)

Day	**Experimental group**			**Control group**		
	mild	moderate	severe	mild	moderate	severe
Day 1	--	18(90%)	2(10%)	2(10%)	17(85%)	1(5%)
Day 2	5(25%)	15(75%)	--	7(35%)	13(65%)	--
Day 3	19(95%)	1(5%)	--	17(85%)	3(15%)	--

From table 2.1, it is observed that in day 1in experimental group majority of patients that is 90% had moderate pain and 10% of patients had severe pain. Also in control group, majority of patients that is 85% had moderate pain, 10% of patients had mild pain and 5% of patients had severe pain.
In day 2 also majority of patients in both experimental group and control group had moderate pain that is 75% and 65% respectively. 25% in experimental group and 35% in control group had mild pain.

In day 3, majority of patients that is 95% had mild pain and 5% had moderate pain in experimentalgroup. Also in controlgroup majority of patients that is 85% had mild pain and 15% had moderate pain.

Table 2.2: Assessment of post-test level of pain

n=40(Experimental group= 20, Control group= 20)

Day	**Experimental**			**Control**		
	mild	moderate	severe	mild	moderate	severe
Day 1	4(20%)	16(80%)	--	2(10%)	18(90%)	--
Day 2	15 (75%)	5(25%)	--	10(50%)	10(50%)	--
Day 3	20(100%)	--	--	17(85%)	3(15%)	--

Table2.1 it is observed that post test assessment it was found that on day 1, majority of patientsi.e 80% had moderate pain and 20% had mild pain in experimental group. Also in control group majority of patients i.e90%had moderate pain and 10% had mild pain.

On day 2,majority of patients i.e75% had mild pain and 25% had moderate pain in experimental group whereas 50% patients had mild and 50% had moderate pain in control group.

On day 3, all the patients (100%) had mild pain in experimental group. Majority of patients that is 85% had mild pain and 15% had moderate pain in control group.

Section III: Assessment of effectiveness of progressive muscle relaxation technique on pain management in patients undergoing abdominal surgery.

Table 3.1: Effectiveness of progressive muscle relaxation technique on level of pain in experimental and control group in day 1

n=40(Experimental group= 20, Control group= 20)

Day 1		**Mean**	**SD**	**t**	**df**	**P value**
Experimental	Pre-test	5.50	0.95	3.68	19	0.02*
	Post-test	5.00	1.21			
Control	Pre-test	5.00	1.08	1.00	19	0.33NS
	Post-test	4.95	1.05			

** significant at P(< 0.01) * significant at P(< 0.05), NS- Non significance

The data in the table 3.1 shows that thet value for df 19 is significant at 0.05 level of significance.in experimental group whereas in control group t value is not significant.It infers that reduction of pain level in 1st post-operative day was significant in experimental group, but in control group, there was no significant reduction of pain level in 1stpostoperative day. Thus it can be interpreted that progressive muscle relaxation was effective as it was applied to experimental group.

Hence, the null hypothesis (H_{01}) is rejected and it infers that there is significant difference between level of mean pain scores among experimental and control group.

Table 3.2: Effectiveness of progressive muscle relaxation technique on level of pain in control and experimental group on day 2

n=40(Experimental group= 20, Control group= 20)

Day 2		Mean	SD	t	df	P value
Experimental	Pre-test	4.10	0.97	10.38	19	0.002**
	Post-test	3.25	0.97			
Control	Pre-test	4.15	1.09	2.52	19	0.33 NS
	Post-test	5.90	1.29			

** significant at P(< 0.01), * significant at P(< 0.05), NS- Non significance

Data in the above table 3.2 shows that the t value for df 19 is significant at 0.01 level in experimental group whereas in control group t value is not significant. It infers that in 2nd post-operative day reduction of pain level was significant in experimental group, but in control group, there was no significant reduction of pain level. Thus it can be interpreted that progressive muscle relaxation was effective as it was applied to the experimental group.

Hence, the null hypothesis (H_{01}) is rejected and it infers that there is significant difference between level of mean pain score among experimental and control group.

Table 3.3: Effectiveness of progressive muscle relaxation technique on level of pain in control and experimental group on day 3

n=40(Experimental group= 20, Control group= 20)

Day 3		Mean	SD	t	df	P value
Experimental	Pre-test	2.45	0.94	5.63	19	0.001**
	Post-test	1.45	0.69			
Control	Pre-test	2.63	0.99	1.00	19	0.001**
	Post-test	2.60	0.88			

** significant at P < 0.01 * significant at P < 0.05, NS- Non significance

Data in the above table 3.3 shows that the in both experimental and control group t value for df 19 is significant at 0.01. It implies that there was significant reduction of pain level on 3rd post-operative day in both experimental and control group irrespective of applied progressive muscle relaxation technique to experimental group. It can be explained as because of use of analgesics and individual's physiological adaptation, pain has reduced in both the groups. Also the study findings has shown that intensity of pain is more on 1st and 2nd post-operative day and it has reduced to mild level on 3rd postoperative day, so effectiveness of progressive muscle relaxation technique could not be found out on 3rd post-operative day.

Hence, null hypothesis (H_{01}) that there is no significant difference between level of mean pain score among experimental and control group is retained for 3rd post-operative day.

DISCUSSION

The findings of the study have been discussed with the reference to the objectives.

1. To assess the level of pain in patients undergoing abdominal surgery

The study findings were supported by a similar study conducted by Chanif C et al. (2019)[4], conducted a study to describe pain intensity and pain distress at the first 24-48 hours experienced by the patients after

abdominal surgery.The study was conducted among 40 adult patients older than 18 years who underwent major abdominal surgery under general anaesthesia and were admitted at Doctor Kariadi Hospital Semarang, Central Java Province Indonesia. The findings revealed that on average, postoperative patients had experienced moderate to severe pain, both in their report of pain intensity and pain distress as evidenced by the range of scores from 4 to 9 out of 10 and median score of 5 and 6 (IQR = 2), respectively. It indicated that postoperative pain was common symptom found in patients after abdominal surgery.

2. **To determine the effectiveness of progressive muscle relaxation technique on pain management in patients undergoing abdominal surgery.**

Good M et.al (2019)[5] supported the study by determining the effect of jaw relaxation, music and the combination of relaxation and music on postoperative pain after major abdominal surgery during ambulation and rest on postoperative days 1 and 2. 500 subjects aged 18–70 in five Midwestern hospitals were randomly assigned by minimization to a relaxation, music, relaxation plus music, or control group. Result shows that all the three treatment groups had significantly less pain than the controls, (P=0.028–0.000) which was confirmed by the univariate analysis of covariance (P=0.018–0.000). Post hoc multivariate analysis revealed that the combination group had significantly less sensation and distress of pain than the control group on all post-tests (P=0.035–0.000), and the relaxation and music groups had significantly less on all tests (P=0.022–0.000) except after ambulation.

Conclusion:

This study examined the effectiveness of progressive muscle relaxation technique on post- operative pain management in patients undergoing abdominal surgery. Major findings of the study are that there is no association of level of pain with selected variables like age, sex, education, occupation, religion, marital status, type of anaesthesia, type of surgery, and family support. So same pain relief measurement should be provided to all post-operative patient irrespective of age, sex, education, occupation, religion, marital status, type of anaesthesia, type of surgery, and family support. It is found that progressive muscle relaxation technique is effective in reducing post-operative pain. Another important finding is that there is no correlation of level of pain with pulse and respiration but it has positive correlation with mean arterial pressure.

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