



# Effectiveness of Progressive Muscle Relaxation Technique on Pain Perception among Patients Who are Subjected to Abdominal Surgery

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## Abstract

An experimental study was conducted to assess the effectiveness of progressive muscle relaxation technique on pain perception among patients who are subjected to abdominal surgery. Experimental repeated measures design was chosen for this study. With a total of 40 male and female patients, 20 patients were considered as experimental group and 20 as control group. The technique that was adopted for this study was random sampling method. Progressive muscle relaxation was given as intervention for experimental group and only observation was made in the control group. Collected data were analyzed by descriptive and inferential statistics. Study results showed that mean pain score for the first day morning in pretest was 6.70 with standard deviation 0.92 and the post test mean was 6.30 with standard deviation 1.03. Thus the mean pain score (6.3) on third post operative day was less compared to mean pain score (6.7) on the first post operative day. From the above mentioned statistical values it is observed that there is a high statistical significance in pain perception at  $P < 0.001$  and there were no changes were in level of pain in control group. This clearly indicates that progressive muscle relaxation technique has influence on pain perception in the experimental group.

**Key Words:** PMR (Progressive Muscle Relaxation); IASP (International Association for the study of Pain); SBP (Systolic Blood Pressure); DBP (Diastolic Blood Pressure).

## Introduction

Everyone has experienced some type or degree of pain. It is the most common reason why people seek health care. Despite being one of the most commonly occurring symptoms in the medical world, pain is one of the least understood. A person in pain feels distress or suffering and seeks relief. The nurse will execute a variety of nursing interventions to bring relief or to restore comfort. The IASP, 1979 defined pain as "An unpleasant, subjective sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage".

Pain is the most common symptom which leads a patient to seek medical help. Pain is defined by each one of us according to our personal experiences and involves a variety of feelings, sensations and

situations. Pain is the symptom of a disease, the treatment of which promotes its resolution. Pain is an individual and subjective phenomenon. The patient's verbalization of the painful experience to the health care professionals will help them to implement the measures that will help in minimizing the level of pain. Pain is also considered to be any type of physical damage that is reported to be felt by the patient at the time when he claims to feel it.

Nursing professionals have made efforts to help individuals in the evaluation and control of their own reactions for which there are strategies that use physiological, cognitive and behavioral techniques. Among them most commonly used is relaxation technique which can be used at any phase of health or illness. Nurses can help individuals recognize the source of pain and stress in their lives and identify methods of adaptive coping. Pain management requires a holistic approach.

## Need for the study

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

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responsibility for the provision of measures to relieve pain.

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.

Bonica and Benedetti (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. Pain triggers a stress response in the sympathetic nervous system which results in increase in muscle tension, heart rate, respiratory rate, blood pressure, and blood glucose level and blood coagulation process. Various relaxation techniques have been used and their effects upon pain have been described in the literature. The relaxation technique used in the post operative period results in improved comfort level of patients, decrease in abdominal muscle tension, reduction of distress caused by painful sensation.

The relaxation technique is therefore 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. Nurses have got a pivotal role in eliminating stress, reducing the pain, and improving the condition of post operative patients

#### *Statement of the problem*

A study to assess the effectiveness of progressive muscle relaxation technique on level of pain and certain physiological parameters among patients following abdominal surgery at Mediscope Hospital, Bangalore.

#### *Objectives of the study*

1. Assess the level of pain and physiological parameter among patients who are subjected to abdominal surgery.

2. Determine the effectiveness of progressive muscle relaxation technique among study group subjects.
3. Associate the selected demographic variables with the physiological parameters.

#### *Hypothesis*

There is a significant decrease in the level of pain perception among patients following abdominal surgery who have practiced progressive muscle relaxation technique than who did not.

#### *Assumption*

Pain is subjective in nature and unique in individual.

### **Research Methodology**

#### *Research Approach*

An evaluative approach of quantitative research was considered appropriate for the present study.

#### *Research Design*

True experimental repeated measures design was chosen for this study. The design can be represented as

	<b>M</b>	<b>E</b>
Group A	– O <sub>1</sub> X O <sub>2</sub>	O <sub>1</sub> X O <sub>2</sub>
Group B	– O <sub>1</sub> – O <sub>2</sub>	O <sub>1</sub> – O <sub>2</sub>

#### *Key Figures*

Group A	-	Experimental Group
Group B	-	Control Group
O <sub>1</sub>	-	Pre test assessment of level of pain
O <sub>2</sub>	-	Post test assessment of level of pain
X	-	Progressive Muscle Relaxation(PMR)
M	-	Morning
E	-	Evening

### *Research Setting*

The study was conducted in Mediscope hospital, Bangalore which is reputed and well equipped with modern facility. In each surgical unit has male and female surgical wards consisting of 60 beds and main block consisting of 62 beds.

### *Population*

The population included in the study was all patients admitted for elective abdominal surgery in hospitals.

### *Sampling criteria*

Male and female patients aged between 18-60 years and patients who underwent elective abdominal surgery.

### *Sample Size*

The total sample was 40, among them 20 patients were considered as experimental group and 20 patients in the control group subjects.

### *Sampling Technique*

The technique that was adopted for this study was random sampling method.

### *Data Collection Tool*

The tool was developed based on the professional experience and the guidance of experts. Part I: Consist of demographic variables Part II Consists pre and post test assessment of pain and physiological parameters like Respiratory rate, pulse rate and Blood Pressure. Part III Consists of numerical pain rating scale, which has 10 cm baseline as per the recommendations. The content validity was obtained from the medical and nursing experts.

### *Data Collection Procedure*

The pilot study was conducted with sample size of 6 patients. The feasibility for the research design was tested. The methodology and tool were modified based on the problems encountered in data collection during the pilot study. Written consent from ethical

committee was obtained. Patients posted for elective abdominal surgery were approached preoperatively. The investigator explained the purpose of the study and assessed the patients who were willing to participate in the study.

The patients were assisted to perform the PMR with verbal instruction during the previous day of the surgery in the wards. The time taken for PMR was 20 minutes. The PMR intervention was performed by the patient on the first post operative day at 7.30 am prior to the administration of the analgesics by 8 am. The pretest of the physiological parameters and level of pain was assessed at 7.25 am using numerical pain rating scale. Post operatively the patient practiced the PMR technique for 20 minutes from 7.30 am to 7.50 am. The post test of the physiological parameters and pain was assessed at 7.55 am after practicing PMR technique. Similarly in the evening, the progressive muscle relaxation intervention was performed by the patient at 7.30 pm prior to the administration of the analgesics by 8 pm.

### *Data Analysis*

The collected data were analyzed by descriptive and inferential statistics. The descriptive statistics were used to declare the demographic variables, assess the level of pain. Inferential statistical analysis, the paired 't' test was used in analyzing the effectiveness of PMR among control and experimental group subjects.

## **Results and Discussion**

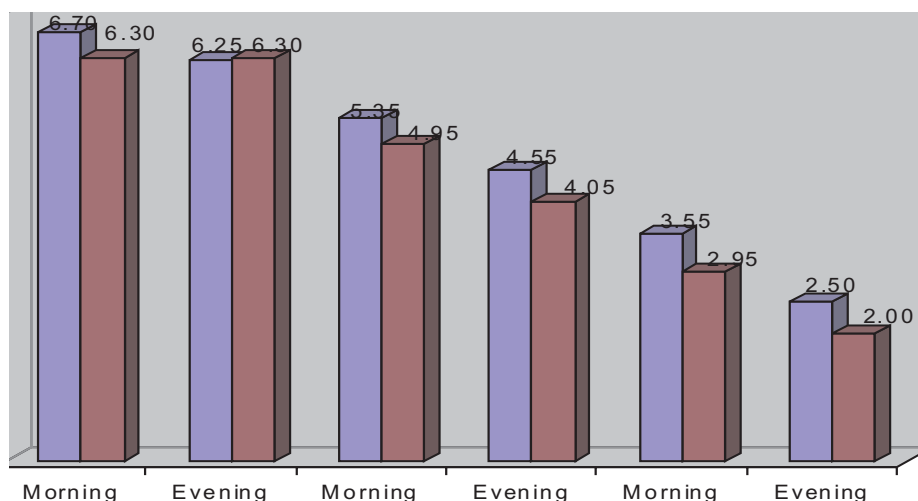
The above table depicts the intensity of pain perception in the initial three post operative days, before and after interventions among experimental group. It reveals the pretest and post test mean and standard deviation of pain perception among the study group subjects. The mean pain score for the first day morning in pretest was 6.70 with standard deviation 0.92 and the post test, mean was 6.30 with standard deviation 1.03. Thus the mean pain score (6.3) on third post operative day was less compared to mean pain score (6.7) on the first post operative day. From the above table it is observed that there is a high statistical significance in pain perception at  $P < 0.001$ .

**Table 1: Distribution of pretest and post test mean and standard deviation of pain perception in different days among the experimental group.**

N=20

Pain	Pre test		Post Test		't' Value	'p' Value
	Mean	SD	Mean	SD		
<b>Day 1</b>						
Morning	6.70	0.92	6.30	1.03	3.559	.002
Evening	6.25	1.02	6.30	0.73	4.819	.000***
<b>Day 2</b>						
Morning	5.35	0.93	4.95	0.89	3.559	.002
Evening	4.55	4.05	4.05	1.0	4.359	.000***
<b>Day 3</b>						
Morning	3.55	1.19	2.95	1.00	5.339	.000**
Evening	2.50	0.95	2.00	0.79	4.539	.000**

\*\*\*P&lt; 0.001



This clearly indicates that progressive muscle relaxation technique has influence on pain perception. The same data is represented in the form of graph in fig.1.

Table 2 depicts the physiological parameters such as respiration rate, pulse rate, systolic blood pressure, diastolic blood pressure and the mean and standard deviation of each variables among the study group. The table reveals that the paired 't' test value of pulse rate was 2.449 and it showed a statistical significance at  $P<0.05$ . The table also shows no significant variation in the respiration rate, systolic blood pressure, diastolic blood pressure in pretest and post test mean and standard deviation. Therefore the table indicates that PMR technique did not show any variations in the respiration rate and the blood pressure. Fig 2 shows the representation of the same data.

When the effect of progressive muscle relaxation technique was assessed comparing with that of the control group, it showed to be highly significant at

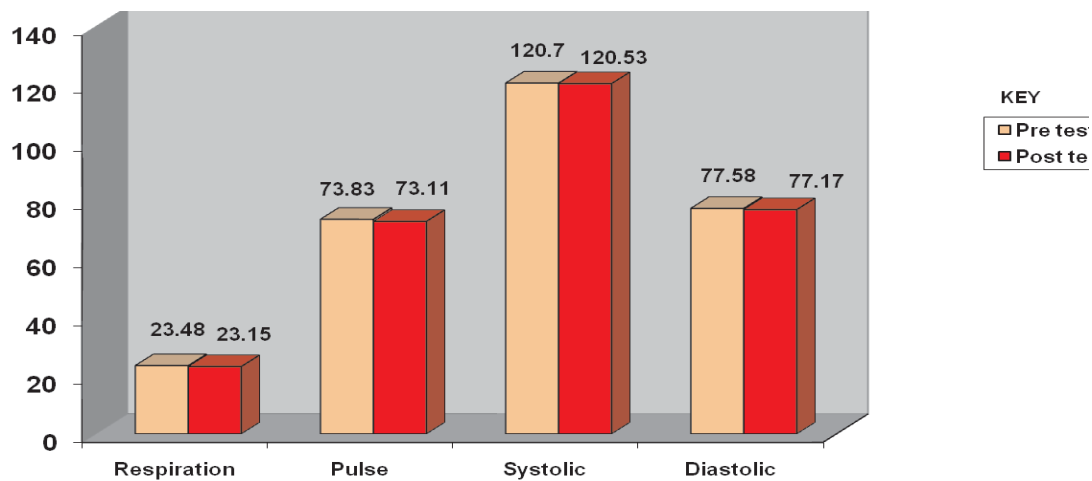
the level of  $p<0.001$ . These findings support the findings of McGrath (1994) that relaxation technique can alter the pain perception and bring a significant reduction in the level of pain from severe to moderate ( $n=35$ ) and from moderate to mild level of pain ( $n=45$ ) in 80 patients who were selected. The study concluded that the psychological factors such as situational and emotional factors can profoundly alter the strength of pain perception.

The pretest and post test assessment score in the study group indicated a marked reduction in the pain intensity. As the reduction of pain perception was noted to be higher in the study group than the control group, it indicated better response of the patients to PMR technique. This indicates that patients can be diverted from pain with PMR technique thereby improving their coping abilities and making their hospital stay shortened. The chi square test shows that there is significant association between the selected demographic variables with the level of pain perception in the study group who are subjected to abdominal surgery.

**Table 2: Distribution of pretest and post test mean and standard deviation of physiological parameters among the experimental group**

**N =20**

Physiological Parameters	Pre test		Post Test		‘t’ Value	p Value
	Mean	SD	Mean	SD		
<b>Respiration</b>	23.48	1.19	23.15	1.11	1.592	.128
<b>Pulse</b>	73.83	7.93	73.11	8.06	2.449	.024
<b>Blood Pressure</b>						
<b>SBP</b>	120.70	6.93	120.53	6.90	.809	.428
<b>DBP</b>	77.58	4.38	77.17	4.16	1.751	.096



In regard to the hypothesis formulated at the start of the research study, there is a significant reduction in the level of pain perception among patients who practiced progressive muscle relaxation technique than the patients who did not practice progressive muscle relaxation during the post operative period. The tested hypothesis of the study is thus accepted.

**Conclusion**

PMR technique is a safe, better and inexpensive measure which brings about a higher level of relaxation and reduction of stress. Patients have greater comfort during the post operative period and healing hastens reducing the number of days of hospitalization. Effective use of PMR technique as a complementary therapy will reduce the intake of sedation and analgesics during the post operative period thereby fastening recovery.

*Recommendations*

1. Replication of the study can be done with large samples.
2. Instead of demonstration a study can be done by using video assisted teaching.
3. A similar study could be conducted among patients following various categories.
4. A comparative study could be done between different educational strategies such as demonstration; video assisted teaching, slide projectors.
5. A comparative study on the effect on progressive muscle relaxation technique and other non pharmacological methods (music, guided imagery) can be done.

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