Original Research Article

A Pre-Experimental Study to Assess the Effect of Relaxation Therapy in Reducing Pain among Orthopedic Patients Admitted in Selected Hospital of Delhi

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ABSTRACT

Aim: the aim of the study is to assess the effectiveness of relaxation therapy (back massage and deep breathing exercise) on pain among orthopedic patients and to assess the improvement in quality of sleep.
Setting and design: quantitative experimental research approach was adopted for the study. It was a pre-experimental study. The present study was conducted in orthopedic ward of St. Stephen's hospital, Delhi.
Method: the population comprised of all the fractured preoperative patients admitted in orthopedic ward. Purposive sampling was used for the study. No blinding wasdone.pre and post intervention (back massage and deep breathing exercise) pain score along with quality of sleep was assessed with the patients' response.
Statistical Analysis used: SPSS version 20 was used for the analysis. Descriptive and inferential statistic was used.
Results: total sample size was 30 fractured patients. The analysis showed that there was improvement in pain level and quality of sleep in all fractured patients due to standard treatment but the evidence of effectiveness was more among the fractured patients received relaxation therapy i.e. (back massage and deep breathing exercise).
Conclusion: the present study revealed that the introduction of relaxation therapy (back massage and deep breathing exercise) among fractured patients had reduction in pain score level and had improved quality of sleep.

Key words: relaxation therapy, back massage, deep breathing exercise, orthopedic patients

INTRODUCTION

Pain and suffering remain a significant dilemma. Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage. It is the most common reason for seeking health care. Nurses encounter patients in variety of setting including actual health care setting, outpatient and at home also.

Providing comfort is the core of nursing. Nurses are in close contact with patients and responsible for their physical and emotional comfort. Nurses play an important role in pain assessment and management in all areas of clinical practice but due to lack of knowledge they are not able to put it effectively.

According to Molonyetal [1] the necessity of assessing pain as a fifth vital sign for all long term residents including recognition and documentation of pain is cognitively impaired. In 2000 Meinhart and Mc. Caffery [2] concluded that pain in

orthopedic patients is just as being stabbed with an ice pack and the severity of pain is best described as how the pain is affecting the normal lifestyle of a normal person. Severity of pain may lead to mental depression, body image destruction.

Grant and Rene 2011 [3] states that back strengthening massage therapy is effective in improving the kyphotic deformity. They stated that back massage and bed rest provide a symptomatic relief in non operative treatment of osteoporotic compression fracture.

In 2007 Chens et al [4] concluded that needling massage and cupping therapy used for myofascitis had a good therapeutic effect of improving blood circulation, removing blood stasis, dredging the channel, promoting the metabolism and relaxing the affected muscle.

Anderson and Errikson Basset in 2003 proved that massage therapy deliver interruptive mechanical stimulation to the soft tissue and cause a fluctuation of interstitial pressure and stimulate the flow of interstitial fluid, which leads to stimulate an electrical energy in the massage are and leads to relief of pain.

Ushanair 2009 [5] founded a technique called effortless diaphragmatic breathing to promote relaxation of the extremities and improve shallow and rapid breathing problem.

Gustavasson et al 2006 [6] showed that relaxation alone or in combination with deep breathing exercise reduces tension, headache and helps to improve immune system. Huietal 2006 [7] concluded that deep breathing exercise lowers the heart rate and blood pressure, increases muscle tension, improve well being and reduce symptoms in patient with distress.

Inspite of the volume of literature, a quick survey was done of orthopedic department and it was found that patients are been given only analgesic therapy and no other non pharmacological measures were used by the nurses. The literature was found for relaxation therapy among postoperative conditions but less data was

available for preoperative orthopedics condition.

Nurses are taught theoretically pharmacological and non pharmacological measures but they were found hesitant to use it in their clinical area. So the researcher felt insight to conduct the study to determine the efficacy of relaxation therapy as selected measures along with analgesic therapy, so that it can be used as a nursing intervention in future to relieve pain.

Objective

- To assess the effect of relaxation therapy (back massage and deep breathing exercise) on pain among orthopedic patients.
- To assess the effectiveness of relaxation therapy (back massage and deep breathing exercise) in improving the quality of night sleep among orthopedic patients.

Hypothesis

There will be significant reduction of pain after the intervention among orthopedic patient

There will be significant improvement of sleep after the intervention among orthopedic patients.

METHODS

Description of trial design

The quantitative research approach was used in the present study. The present study was a pre-experimental study for 1 month. In the present study the independent variable was relaxation therapy (back massage and deep breathing exercise) for fractured patient. The dependent variables were pain and improvement in sleep.

There was no change to trial design.

Participants

A prior assessment was done by the researcher to assess all the orthopedic patients to on the basis of the screening sheet made by the researcher. Exclusion criteria were: 1) Patients who are not admitted in orthopedic ward of St Stephen's hospital. 2) Patients without fracture. 3) Patients below 18 years of age. 4) Patients who are not conscious and oriented. 5)

Patients who have less than 5 days stay in hospital 6) Patients who are not willing to participate in the study. 7) Patients who cannot read and write Hindi/English.

Description of instrument
a) Demographic and clinical variables
   Age, gender, education level, monthly income, residence, occupation
   Type of fracture, duration of fracture, sleep hours of afternoon, sleep hours of night, level of pain score pre intervention, facial expression vital signs. Clinical variables were filled by the researcher.
b) Pain measurement scale-
   Visual analogue scale a scale which carries the marks from 0-10 and patients was shown to mark as per the level of pain perception.
   Wong baker faces pain scale this was used to assess the facial expression.
c) Structured interview schedule was used to assess the quality of sleep at 0 day of pre intervention and at day 3 8pm in the night.

Inclusion Criteria
- Patients admitted in orthopedic ward of St. Stephen's hospital
- Patients with fracture
- Patients above 18 years of age.
- Patients who are conscious and oriented.
- Patients who have minimum 5 days stay in hospital
- Patients who are willing to participate in the study.
- Patients who read and write Hindi.

Training
Researcher went for the 15 days training programme prior research study of back massage and deep breathing exercise in the physiotherapy department of St. Stephen's hospital.
Study setting and location
The present study was conducted in orthopedic ward of St Stephen's hospital, Delhi.

Intervention

1) Orthopedic patients were screened based on the inclusion and exclusion criteria and then selected to enroll in the study.
2) Orthopedic patients were assured of confidentiality of their data.
3) Orthopedic patients were explained about the purpose of the study.
4) Patient information sheet were given to them and consent was taken.
5) Patients were selected by purposive sampling.
6) Collection of baseline demographic variable with the help of structure interview schedule was done for the patients.
7) Pre intervention of relaxation therapy (back massage and deep breathing exercise) pain score of the patients and last night response of quality of sleep was assessed.
8) Then the back massage and deep breathing exercise was provided to patients after giving comfortable position.
9) The techniques used for back massage were effleurage, kneading, hacking and skin rolling started from the iliac crest till supraclavicle and axillary lymph node. This technique was continued for 15 -20 min.
10) Deep breathing exercise was instructed after the back massage therapy.
11) This intervention was given continuously for three day for two times i.e. 8-9 am in the morning and 8-9 pm in the evening so that to assess the quality of sleep also.
12) Standard analgesic treatment was continued same as routine.
13) After the last intervention of 3rd day patient's pain score and last night quality of sleep was again assessed.

Outcome:
Primary outcome researcher hypothesized that back massage and deep breathing exercise will reduce pain.
A structured interview schedule was used to assess the demographic variables and clinical variable. Proforma was assessed

to see the patient's response. Pain score level was assessed with the help of visual analogue scale and Wong baker faces pain scale this was used to assess the facial expression. Data was collected by the researcher herself. Inter-rater reliability was used along with the researcher and resident on duty.

Changes to outcome

There were no changes to intervention outcomes after the intervention given.

Sampling size

For present study purposive sampling method was used. Total sample size was taken 30 to prevent attrition. No randomization was done. No blinding was done.

Statistical method

Data were analyzed using SPSS (version 20). The level of significance was kept at 0.05 level. The patients were homogenous with regard to demographic variable and clinical variable as analysed by Chi-square and Fischer's exact test. Pain level score and quality of sleep was assessed by paired t test. No additional analysis was used.

RESULTS

All 30 patients were allocated to primary outcomes. There were no losses and no exclusion in the study.

Patients having mild pain pre intervention mean score was 0.2 and post intervention mean score was 1.6which was significant at 0.019 and showed that there was reduction in pain at p score <0.05. When we compare the moderate pain(4-7) it was found that pre intervention mean was 5.52 and post intervention mean was 4.16 which was significant at 0.011hence the intervention was found effective at p<0.05 level

Patients with severe pain (8-10) pre intervention mean was 9.5 which was reduced in post intervention mean i.e. 8 which was significant at 0.002 level hence the intervention was found effective at p<0.01 level.

When we compare total number of patients with their pain score pre(mild-5,moderate-19 and severe-6) and post intervention(mild-21,moderate-6 and severe-3) it was found that pain has reduced from severe pain to mild so in post intervention mild score patient increased hence patients with moderate and severe pain were reduced which showed the effectiveness of the treatment.

Table:1 demographic variable of patients. N=30					
Characteristics	**Frequency**	**Percentage**	**Test used**	**df**	**P**
Age(in years)					
20-30	10	33.33	Fischer's exact test	3	0.76
31-40	8	26.66			
41-50	7	23.33			
51-60	5	16.66			
Gender					0.41
Male	25	83.33	Chi square test	1	
female	5	16.66			
Educational status					0.78
Till 10th class	12	40	Fischer's exact test	3	
Till 12th class	7	23.33			
Graduate	10	33.33			
Post graduate	1	3.33			
Income per month					0.76
5000-10000	10	33.33	Fischer's exact test	3	
10001-15000	9	30			
15001-20000	2	6.66			
20001 and above	9	30			
Type of service					0.98
Government	16	53.33	Fischer's exact test	3	
Private	11	36.66			
Business	2	6.66			
unemployed	1	3.33			

*significant at 0.05 level,p<0.05 level

The above table-1 is the description of demographic variable in which it was found that most of the patients were male. In the given table age was generalized along with educational status and income per month. Most of the patients belonged to government and private service.

Recruitment

Formal administrative permission was obtained from director of St. Stephen's hospital, Head of Department of orthopedics, head of department physiotherapy for the training and nursing superintendent of St Stephen's hospital, Delhi. There was neither attrition nor loss. The intervention was completed and was not stopped in between.

Baseline data

The patients were homogenous with regard to demographic variable and clinical variable. Their pain score level was also assessed pre-intervention of back massage and deep breathing exercise. The analysis was done by originally assigned group.

Outcomes and estimation

The analysis shows that the introduction of back massage and deep breathing exercise lead to reduction of pain level and improvement in quality of sleep. The analysis was found effective as pre mean was more than the post intervention mean at significant level of 0.05. There were no other analysis were performed including subgroup analysis.

Harms

There was no episode of any harmful incident for patients.

Table:2 clinical variable of patients. N=30

Characteristics	Frequency	Percentage	Test used	df	P
Type of fracture				5	0.41
Complete fracture	7	23.33	Fischer's exact test		
Incomplete fracture	3	10			
Comminuted fracture	1	3.33			
Closed fracture	8	26.66			
Open compound fracture	7	23.33			
Open complex fracture	4	13.33			
Duration of fracture				3	0.75
Less than 2 month	23	76.66	Fischer's exact test		
3-4 month	0	Nil			
5-6 month	1	3.33			
6month and above	6	2.22			
Last night sleep				2	0.32
Till 4 hours	23	76.66	Fischer's exact test		
5-7 hours	20	20			
8-11 hours	1	3.33			
Severity of pain				2	0.34
0-3	5	16.66	Fischer's exact test		
4-7	19	63.33			
8-10	6	20			

*significant at 0.05 level,p<0.05 level

In given table 2 it was found that patients were having generalized finding related to type of fracture, duration of fracture was significant to less than 2 month. Most of the patients were having less than 4 hours sleep in previous night before intervention. Patients belonged to 4-7 score of pain were significant.

Table 3 Comparison of the patient's pre intervention observations according to Severity of pain score. N=30

Severity of pain	Pre intervention score	Post intervention score	Pre intervention Mean	Post intervention Mean	Mean difference	t	p
Mild pain 0-3	5	21	0.2	1.6	3.8	2.49	0.019*
Moderate pain 4-7	19	6	5.52	4.16	45.92	2.75	0.011*
Severe pain 8-10	6	3	9.5	8	19.5	4.64	0.002**

**significant at 0.01 level, *significant at 0.05 level, p<0.05 level

In given table it was found that patients having mild pain pre intervention mean score was 0.2 and post intervention mean score was 1.6which was significant at 0.019 and showed that there was reduction in pain at p score <0.05. When we compare the moderate pain(4-7) it was found that pre intervention mean was 5.52 and post intervention mean was 4.16 which was significant at 0.011hence the intervention was found effective at p<0.05 level

Patients with severe pain (8-10) pre intervention mean was 9.5 which was reduced in post intervention mean i.e. 8 which was significant at 0.002 level hence the intervention was found effective at p<0.01 level.

When we compare total number of patients with their pain score pre(mild-5,moderate-19 and severe-6) and post intervention(mild-21,moderate-6 and severe-3) it was found that pain has reduced from severe pain to mild so in post intervention mild score patient increased hence patients with moderate and severe pain were reduced which showed the effectiveness of the treatment.

Table 4 Comparison of the patients pre intervention observations according to last night sleep. N=30

Last night sleep hours	Pre intervention score	Post intervention score	Pre intervention Mean	Post intervention Mean	Mean difference	t	p
2-4 hours (0-3 score=poor sleep)	20	4	2.05	3.25	56.8	5.39	0.001***
5-7 hours(4-7 score=moderate sleep)	6	17	5.16	5.94	52.08	2.43	0.023*
8-11 hours (8-10 score=good sleep)	4	9	8.25	8.98	46.98	0.94	0.036*

***significant at 0.001 level, *significant at 0.05 level, p<0.05 level

In the above table-4 pre intervention last night sleep hours(poor sleep-20,moderate-6 and good-4) were compared with post intervention(poor-4,moderate-17 and good-9) after comparison of the poor sleep pre intervention and post intervention score it was found significant at 0.001 level, moderate sleep was found significant 0.023i.e. p<0.05 and good sleep was found significant at 0.03i.e. p<0.05.hence the treatment was found effective.

DISCUSSION
Limitation
The study was limited to a specific geographical are (Delhi), specific disease condition i.e. fracture, no randomization and blinding which imposes limit for generalization.

Generalizability
- The same study can be used as a crossover parallel design to increase the significance.
- The same study can be concluded on a larger sample over a longer period to increase the generalizability.
- A similar study can be conducted on different medical condition to assess the effect of relaxation therapy.
- Other hospital can be used as setting for making it a multicenter trial.

Interpretation

In the present study researcher has used pre-experimental study. The present study aimed at the assessment of pain score and quality of sleep. Study findings have concluded that pain score level was reduced among patients and quality of sleep was improved.

The present study concluded the same finding as by Eghbali Maryam et al [8] they considered massage as a safe and effective intervention which is cheap and executable method for treating pain in all medical health care centers and even at patient's home. They suggested that kind of massaging is practicable in short time, to prevent or reduce secondary complication and pain severity.

Watson et al 2003 [9] concluded that analgesic action of massage therapy is releasing endogenous opioid substance in

the corresponding segment of spinal cord. The pain receptors activated by massage, stoke leads to release of opioid substances in the spinal segment at which the pain bearing nerves center which leads to long lasting analgesia.

The present study was found effective in reducing pain but a study conducted by Emma Dunford [10] reviews the existing, peer-reviewed evidence for the use of relaxation and mindfulness in both acute and chronic pain. There is some evidence that relaxation can reduce pain outcomes in both acute and chronic pain, however there is evidence that these improvements are not maintained over time.

Protocol for data collection

1) Self introduction and establishment of rapport with the patients was done.
2) Provision of conducive environment by providing privacy for the interview schedule was given for data collection.
3) Patients were screened based on inclusion and exclusion criteria and then enrolled for the study.
4) Patients were ensured for confidentiality of their data.
5) The purpose of the study was explained to patients.
6) Patient information sheet was given to patients and consent was obtained.
7) Patients were selected by purposive sampling for the intervention.
8) In the present study total 30 samples were enrolled.
9) Collection of baseline demographic variables and clinical variables with the help of structured interview schedule was done.
10) Pre intervention of relaxation therapy (back massage and deep breathing exercise) pain score of the patients and last night response of quality of sleep was assessed.
11) Then the back massage and deep breathing exercise was provided to patients after giving comfortable position.
12) The techniques used for back massage were effleurage, kneading, hacking and skin rolling started from the iliac crest till supraclavicle and axillary lymph node. This technique was continued for 15 -20 min.
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Conflicts of interest
There were no conflicts of interest.

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How to cite this article: Sharma P, Nisha, Ruhil P. A pre-experimental study to assess the effect of relaxation therapy in reducing pain among orthopedic patients admitted in selected hospital of Delhi. Int J Health Sci Res. 2019; 9(10):136-143.

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