

## Conventional Therapeutic Exercise on Low Back Pain

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DOI:10.21276/sijtc.2019.2.6.4

| Received: 15.07.2019 | Accepted: 23.07.2019 | Published: 26.08.2019

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### Abstract

**Background:** Nurses are the major work force of any health care. Highest incidence rates of work-related low back problems seen among nurses. Thus the present study was conducted with the aim to determine effect of conventional therapeutic exercise on low back pain. **Methods:** Quasi experimental research design was adopted with 60 samples who met the inclusion criteria. Samples were allocated into experimental group (n=30) and control group (n=30) by convenience sampling technique. Pre-test was conducted by using Numerical pain rating scale and Rolland Morris Low Back Pain and Disability Questionnaire in both experimental and control group. Conventional therapeutic exercise was administered to the experimental group and the control group was continued with the routine procedure. Post-test was conducted after 2 weeks with same tool for both the group. Data were analyzed using SPSS. **Results:** The study findings revealed that the low back pain and its related disability was present among staff nurses working in intensive care unit and operation theatre. Conventional therapeutic exercise was effective in reducing the level of low back pain at the level of  $p < 0.001$  in the experimental group. **Conclusion:** Conventional therapeutic exercise may be routinely practiced in the hospital thereby preventing the low back pain which in turn makes the nurses efficient to provide productive and quality nursing care.

**Keywords:** Conventional therapeutic exercise, Intensive care unit, Low back pain, Operation Theatre, Staff Nurses, Therapeutic exercise.

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### INTRODUCTION

Pain is an unpleasant sensory and emotional experience felt in the mind due to actual or potential tissue damage in a part of the body. It is a highly subjective sensation rather than objective phenomena. Low back pain (LBP), perhaps more accurately called lumbago or lumbosacral pain, occurs below the 12th rib and above the gluteal folds [1, 2]. It involves muscles, nerves and bones of the back and it can vary from dull constant ache to sudden sharp feeling [3]. Low back pain is a common public health problem may result in loss of labour force, serious financial loss and various physical and psychological problems due to its chronic nature [4, 5].

Low back pain (LBP) is a highly prevalent health problem responsible for serious suffering and disability than any other health condition across the world [6]. The literature review points out that even mild LBP results in significant function loss and decreases quality of life for individuals [7]. Nursing is one of the occupations with a high risk for back injuries

[8]. Nurses are among the professionals with the highest incidence rates of work-related low back problems [9].

Hospitals are places of health services that include risk factors of various degrees for occupational safety and physical, emotional and social wellbeing of nurses [10]. The risk factors for low back pain among nurses are physical, personal and ergonomic risk while delivering nursing intervention [11, 12]. The nurses who spend an important part of their daily life at hospitals may be exposed to various risk factors that threaten low back health because of their working areas and occupational responsibilities. Especially the nurses working in intensive care units and Operation Theatre (OT) experience low back pain more frequently due to reasons such as providing patient care by bending forward for long durations, over-forcing/over-loading some body parts while repositioning patients, and sparing more time for patient care [13, 14]. Nurses working in intensive care units experienced low back pain, and especially those working in internal medicine and pediatric intensive care units and working in shifts had higher average pain scores [15]. Due to the low

back pain caused by these risk factors, every year thousands of nurses in the world work with less efficiency receive medical reports and/or retire early.

Taking precautions for prevention of LBPs in nurses is important in order for nurses to exercise their fundamental right to work under healthy and safe conditions, to maintain their professions and to provide better support for their patients [16]. Regular education on good body postures, physical fitness and appropriate body mechanism may help in prevention of low back pain among nurses. Low back pain may be treated by medications, mobilization, stretching exercise, stabilization exercise, ergonomic advice and postural advice and home remedies. Exercise plays an important role in preventing and reducing low back pain by strengthening the back muscles and improving flexibility. Prescription of specific stretching and strengthening exercises Exercise therapy has successfully resolved lower back pain relating to the predisposing mechanism of injury [17]. Many Literature reviews also proved that stretching exercise were effective in reduction of low back pain. Hence the investigators had made the observation with the hypothesis of reduction in the level of low back pain after administration of therapeutic exercise in the experimental group than the control group.

## METHODS

The quasi experimental research design was conducted with the aim to determine the effectiveness of conventional therapeutic exercise on reduction of lower back pain among staff nurses at selected hospital in Chennai. The investigator explained about the study and obtained the informed consent from the participants. Samples who met the inclusion criteria were selected by using convenience sampling technique. Experimental group (n=30) samples were selected from intensive care unit and control group

(n=30) samples were selected from OT. Staff nurses who were suffering with spinal disorders, disc prolapse, undergone spinal surgeries and on the treatment for back pain were excluded from the study. Demographic variables were collected by using structured questionnaire. The pre-test assessment was done by using Numerical pain rating scale and Rolland Morris Low Back Pain and Disability Questionnaire. The experimental group was received conventional therapeutic exercise. Schober's test was done to measure the ability of a nurse to flex the lower back. Exercise to the back muscle stretching and strengthening of the muscles includes spinal extension exercise like simple back extension, bird dog, prone spinal extension press up, the founder (to bend down), spinal flexion like knee to chest, lower back rotational stretch, pelvic tilt, bridge exercise, cat and camel stretch, lumbar crunch exercises. It was administered twice a day for 15 days and each session of exercise consists of 15 minutes. The control group remains in the same procedure to do their daily routines. The post-test assessment was done at the end of fifteenth day by using same assessment tool for both experimental and control groups. Data were analyzed by descriptive and inferential statistics using SPSS statistical package.

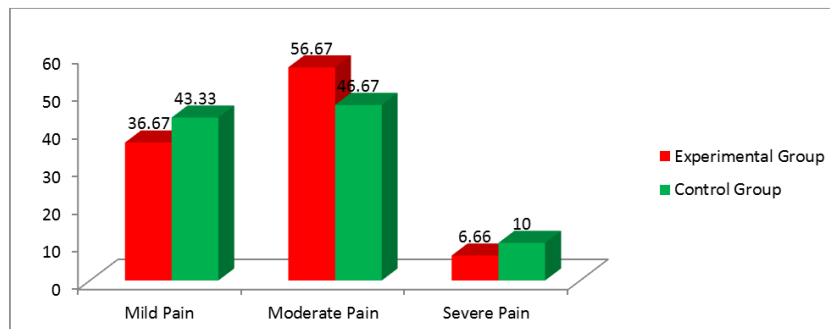
## RESULTS

The present study observed that majority 20 (66.67%) of the staff nurses were in the age group of 22-26 years and more than 80% of them were female. Out of 30 samples in both the group, around 60% of them were graduate nurses and were working in intensive care unit and had 1-3 years of experience. Majority of them had back pain due to handling of heavy objects in the hospital. Around 40% them were only on the allopathy treatment of analgesics and few of them were having the habit of taking oil massage for back pain as depicted in Table-1.

**Table-1: Frequency and Percentage Distribution of Demographic Variables**

Demographic Variables	Experimental Group		Control Group	
	Frequency	Percentage	Frequency	Percentage
<b>1.Age in Years</b>				
a) 22-26	20	66.6	20	66.6
b) 27-30	6	20	5	16.6
c) 31-35	4	6.6	5	16.6
d) 36-40	-	-	-	-
<b>2.Sex</b>				
a) Male	5	16.6	6	20
b) Female	25	83.3	24	80
<b>3.Marital Status</b>				
a) Married	9	30	12	40
b) Unmarried	21	70	18	60
<b>4) Education</b>				
a) ANM	1	3.3	6	20
b) Diploma	10	33.3	8	26.6
c) Graduate	18	60	16	53.3
d) Post graduate	1	3.3	-	-
<b>5) Area of working</b>				
a) ICU	18	60	12	40
b) OT	12	40	18	60
<b>6) Years of Experience</b>				

a) 1-3	19	63.3	19	63.3
b) 4-6	11	36.6	11	36.6
c) 7-10	-	-	-	-
<b>7) Duration of low back pain</b>				
a) > 1 year	21	70	18	60
b) < 1 year	9	30	12	40
<b>8) Have you ever handled any heavy objects?</b>				
a) Yes	25	83.3	26	86.6
b) No	5	16.6	4	13.3
<b>9) If yes, is it at</b>				
a) Home	1	3.3	9	30
b) Hospital	29	96.6	21	70
<b>10) Have you undergone any treatment?</b>				
a) Yes	10	33.3	13	43.3
b) No	20	66.6	17	56.6
<b>11) If yes, what type of treatment?</b>				
a) Allopathy	15	50	17	56.6
b) Indian medicine	4	13.3	4	13.3
c) Natural treatment	4	13.3	2	6.6
d) Others	7	23.3	7	23.3
<b>12) If allopathy, what type of medicine?</b>				
a) Oral	22	73.3	18	60
b) Injectable	1	3.3	1	3.3
c) Ointment	2	6.6	3	10
d) Others	5	16.6	8	26.6
<b>13) If Indian medicine, what type of medicine?</b>				
a) Oil massage	10	33.3	11	36.6
b) Oral medicine	7	23.3	5	16.6
c) Others	13	43.3	14	46.6



**Fig-1: Percentage distribution of pre-test level of low back pain in the experimental and control group**

Figure-1 portrays that, in the pre-test 11(36.67%) had mild pain, 17(56.67%) had moderate pain and two (6.66%) had severe pain. Similarly in

control group, 13(43.33%) had mild pain, 14(46.67%) had moderate pain and three (10%) had severe pain.

**Table-2: Frequency and percentage distribution of level of Low Back Pain Disability in the experimental and control group (n = (30+30))**

Level of Low Back Pain		Mild disability		Moderate disability		Severe disability	
		No	%	No	%	No	%
Experimental group	Pre-Test	21	70	9	30	0	-
	Post- Test	25	83.33	5	16.67	0	-
Control group	Pre-Test	18	60	12	40	0	-
	Post- Test	17	56.67	13	43.33	0	-

The table-2 revealed that, in the pre-test 21(70%) of them had mild disability and nine (30%) had moderate disability in experimental group.

Similarly in control group, 17(56.67%) had mild disability and 13(43.33%) had moderate disability. None of them had severe disability in both the group.

**Table-3: Effectiveness of conventional therapeutic exercise on Level of Low Back Pain among staff nurses in experimental group**

Level of Low Back Pain	Mean	S.D	Mean Difference	paired 't' Value
Pre-test	7.27	1.28	3.26	t = 7.146 p = 0.001 S***
Post-Test	3.54	1.34		

\*\*\*p&lt;0.001, S – Significant

Within the experimental group the effectiveness of exercise was analysed by paired 't' test which revealed that there was a difference in the pre-test (7.27±1.28) and post-test (3.54±1.34) mean value in

the experimental group and found statistically significant at the level of p<0.001 revealing that the intervention is beneficial in reducing the LBP.

**Table-4: Comparison of post - test level of low back pain between experimental group and control group among staff nurses**

Level of Low Back Pain	Mean	S.D	Mean Difference	Unpaired 't' Value
Experimental Group	3.54	1.34	0.40	t = 4.146 p = 0.001 S***
Control Group	6.32	2.13		

\*\*\*p&lt;0.001, S – Significant

Unpaired 't' test was used to compare the level of low back pain between the control and experimental group revealed the post-test mean 3.54 with 1.34 standard deviation, whereas in control group it was 6.32 with SD of 2.13. It was also proved that there was statistically (p<0.001) significant difference between the experimental and control groups in level of LBP.

## DISCUSSION

Low back pain is the most costly musculoskeletal disorder affecting nurses. It is estimated that 22% to 65% of individuals have episodes of back pain in their life time. The main cause of this problem is maintaining poor posture in work place. The present study observed that around 50% of them had mild to moderate pain and few of them had severe pain and also had mild to moderate disability. This finding was supported by Mostafa A. F *et al.*, who reported that eighty-five percent of them had LBP and their pain was related to work incidents [18]. Similarly another study was conducted by Tinubu BM *et al.*, who found that prevalence of low back pain among nurses was 79.3% and the highest incidence found in specialty ICU nurses like nurses who works in pediatric and nephro ICU unit [19]. Low back pain can be prevented completely if the necessary precautions are taken. In this context, sitting in a proper and controlled way, lifting legs correctly and well-balanced, exercising to strengthen low back and stomach muscles, applying principles of body mechanics correctly, abstaining from activities that presses low back area, taking breaks during occupational duties that require sitting or bending forward for a long time are important precautions. Rebecca Gordon *et al.*, 2016, conducted a systematic review of the effects of exercise and physical activity on non-specific chronic low back pain and found that exercise was more effective in LBP [20]. The present study intensively analyzed the effectiveness of

conventional therapeutic exercise on LBP and observed that there is effective in reduction of LBP in the experimental group who had received the exercise whereas in the control group who had routine practice had no improvement in the level of LBP. The findings of the present study was supported by Maurits van Tulde, 2000 who revealed that Exercise therapy was more effective in reduction of LBP, to increase return to normal daily activities and work. Similarly the study conducted by Nair et al and concluded that back strengthening exercise found to be effective in reducing low back pain and improving the functional performance [21]. In another study by RB Wattamwar *et al.*, who observed the effect of conventional occupational therapy and yoga as compared to only conventional occupational therapy in Chronic Low Back Pain and found that conventional occupational therapy and yoga is more effective than conventional occupational therapy, showing significant improvement in the back extensor strength, spine range of motion, & social life of the patient. They also concluded that yoga can be effectively used as an adjunctive method with conventional occupational therapy for chronic low back pain for a sound mental and physical health [22]. In current study investigated only with conventional exercise therapy so yoga may be incorporated in future studies. Hence the study follows a hypothesis that conventional therapeutic exercise is effective in reducing Low back pain.

## CONCLUSION

The study findings observed that the low back pain is common among nurses working in ICU & OT and conventional therapeutic exercise is effective in reducing the lower back pain. It may be practiced in the hospital as a routine thereby can prevent the LBP and promote the health and quality of life of staff nurses which in turn make the nurses to provide productive

and quality nursing care. As nurses play an important role in protecting, maintaining and improving patients' health, nurse's health also very much importance in order to be able to provide effective care without interruption and be more beneficial for the patients and also prevent the quit their jobs or change their work places because of LBP.

## ACKNOWLEDGMENT

The authors would like to thank all the staff nurses for participating in this research study and also thank the nursing supervisor of ICU and OT for their support to complete the study successfully.

## CONFLICT OF INTEREST

The authors declared that the conflict of interest was none

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