A Study to Assess the Effectiveness of Extension Exercise on Low Back Pain Among Staff Nurses Working in Shri Vinoba Bhave Civil Hospital, Silvassa

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ABSTRACT:

Introduction: Pain is an unpleasant sensory and emotional experience associated with actual and potential tissue damage. Its stimulus is physical and/or mental in nature. Globally, about 40% of people have LBP at some point in their lives, with estimates as high as 80% of people in the developed world. Approximately 9 to 12% of people (632 million) have LBP at any given point in time, and nearly 25% report having it at some point over any one-month period. Exercise appears to be useful for preventing low back pain. Exercise is also probably effective in preventing recurrences in those with pain.

Aim: The main aim of the study was to assess the effectiveness of extension exercise on low back pain among staff nurses working in Shri Vinoba Bhave Civil Hospital, Silvassa.

Materials and Methods: A Pre-experimental one group pre-test post-test design was adopted for the study. 60 patients were selected by using non-probability consecutive (total enumeration) sampling technique. Data was collected by self-administered structured questionnaire and level of low back pain with numerical pain rating scale.

Result: The result of the study shows that in the pre-test the mean pain score was 4.23, with standard deviation of 1.12 and mean % 42.3, whereas in the post-test mean pain score was 0.95 with standard deviation of 1.03 and mean % 9.5. The effectiveness of mean % was 32.8. This reveals that the extension exercise was effective in reducing the low back pain among staff nurses.

Conclusion: It was concluded that the extension exercise was effective on reducing low back pain among staff nurses working in Shri Vinoba Bhave Civil Hospital, Silvassa.

Keywords: Extension exercise, low back pain, staff nurses.

INTRODUCTION:

Pain is generally an unpleasant feeling in response to an event that either damages or can potentially damage the body's tissues. There are four main steps in the process of feeling pain: transduction, transmission, perception, and modulation. The nerve cells that detect pain have cell bodies located in the dorsal root ganglia and fibres that transmit these signals to the spinal cord. [1]

Low Back Pain (LBP) is one of the occupational musculoskeletal diseases that occurs most commonly in nurses among all health professionals. LBP is a common occupational health problem that results in serious physical, cognitive, sensory, emotional and developmental obstacles for nurses. The frequency of LBP in nurses ranges between 40% and 97.9% and occurs more frequently in nurses when compared with other individuals in society. There are various physical and psychosocial risk factors that cause LBP in nurses. The practices that require heavy lifting such as transferring and carrying the patients as a part of nursing care, standing for a long time, are among the main factors that cause LBP in nurses. Preventing LBPs in nurses is important in order for nurses to exercise their fundamental right to work under healthy and safe conditions and to provide better support for the patients. Necessary individual and institutional precautions should be taken in order to prevent LBP in nurses.

NEED AND SIGNIFICANCE OF THE STUDY:

Lower back pain (LBP) is a global problem of public health importance, it affects 70–85% of the world's population. Occupational low back pain is the largest single health problem related to work and absenteeism and most common cause of incapacity among workers aged less than 45, it primarily affects young adults. Occupational lower back pain affects the person economically, and its leads to work incapacity, causes suffering to patients, involves costs due to lost productivity, days off work, medical expenses and also affecting person social productivity.

An estimated report on prevalence and impact of musculoskeletal injuries among nurses at Netherland, shown that 52% of them had complaints of chronic low back pain and 48% of them had complaints of acute low back pain. Among them 12% of nurses left their job, 20% transferred to a different unit, 38% of nurses suffered and applied sick leave and 6%, 8%, and 11%, of nurses reported even changing jobs for neck, shoulder and back injuries respectively.

OBJECTIVES:

The objectives of the study are:

- Assess the level of low back pain among staff nurses.
- Assess the effectiveness of extension exercise on low back pain among staff nurses.
- Associate the level of low back pain with selected demographic and clinical variables.

HYPOTHESES:

H1: The mean post test score of low back pain will be significantly lower than the mean pre-test level of back pain after extension exercise among staff nurses who had low back pain at 0.05 level of significance.
H2: There will be significant relationship between level of low back pain with their socio-demographic and clinical variables at 0.05 level of significance.

RESEARCH DESIGN AND METHOD: A Pre-experimental one group pre-test post-test design was adopted for the study.

SUBJECT: 60 patients were selected by using non-probability consecutive (total enumeration) sampling technique.

STUDY TOOL: Data was collected by self-administered structured questionnaire and level of low back

pain with numerical pain rating scale.

VARIABLES
DEMOGRAPHIC VARIABLES
In the present study the demographic variables are; Gender, Age, BMI, Marital Status, Total years of experience, Diet, Present working area, Designation, Types of foot wear, Distance of travel, Mode of travel and Type of family.

CLINICAL VARIABLES
In the present study the clinical variables are , How long do you have low back pain, Type of low back pain Do you have, How many hours feel low back pain per day, How frequent you experience the low back pain, Which of the following factors often contribute to low back pain, What measures you take when you have low back pain, Do you adopt any occupational safety measures given by institution like, Do you practice any exercise?, If yes, what type of exercise you do, What is the duration of your exercise per day, Is the pain made worse by any of the following, Have you ever consulted to the doctor for low back pain.

INDEPENDENT VARIABLES
In the present study independent variable is extension exercise.

DEPENDENT VARIABLES
In the present study, dependent variable is low back pain.

SELECTION CRITERIA:
INCLUSION CRITERIA:
The study includes staff nurses who are:
- Willing to participate in the study
- Who have mild to moderate low back pain

EXCLUSION CRITERIA:
The study excludes staff nurses;
- Who are not willing to participate.
- Who are taking pain killer medication
- Who are pregnant
- Who have severe pain
- Who has no pain
- Who have any orthopaedic condition

TOOL USED IN THE STUDY:
SECTION-I DEMOGRAPHIC VARIABLE
Demographic variable collects the data about the characteristics of the sample population. The participants were requested to provide necessary information on the characteristics by placing tick mark on appropriate answer. It includes Gender, Age, BMI, Marital Status, Total years of experience, Diet, Present working area, Designation, Types of foot wear, Distance of travel, Mode of travel and Type of family.

SECTION-II CLINICAL VARIABLE
Clinical variables collect data about number of inputs that cannot be controlled by clinicians or the healthcare system.

In the present study, the clinical variable was: duration of low back pain, type of low back pain, hours of low back pain, frequency of low back pain, factors contributing to low back pain, measures for low back pain, occupational safety measures given by institution, practice any exercise, type of exercise, duration of exercise, pain made worse by, ever consulted with doctor.

SECTION-III NUMERICAL PAIN RATING SCALE
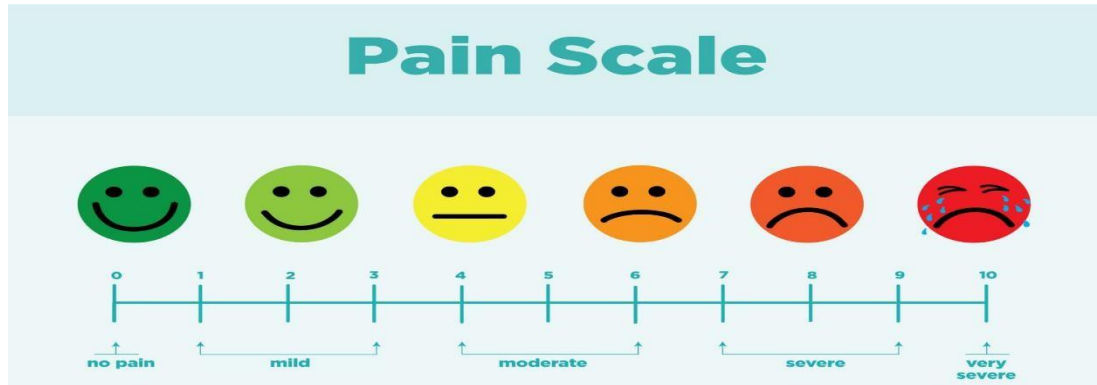
Numerical pain rating scale is a tool use to assess pain intensity with 0-10 range score. It was used to assess the level of low back pain among staff nurses.

DATA COLLECTION PROECDURE:

A brief introduction of self and explanation about the procedure, purpose of collection of data, duration, experimental procedures, alternatives, risks, benefits and that it is his or her right to 'withdraw' or 'opt out' of the study or procedure at any time, was explained. A good rapport was established with the staff nurse and informed consent was obtained from the participants. Anonymity and confidentiality were assured for their voluntary participation.

A. PRE-TEST (SURVEY):

In pre-test in the first week of data collection period the demographic, clinical variables and level of low back were collected from the samples, by using a self-administering structured questionnaire to assess the level of low back pain among staff nurses.

TABLE 1: SURVEY RESULT OF THE SAMPLE

TOTAL SAMPLE SURVEY	SAMPLE WITH BACK PAIN	SAMPLE WITH NO LOW BACK PAIN	SAMPLE ELIGIBLE FOR PERFORMING EXTENSION EXERCISE
256	158	98	60

B. INTERVENTION:

After 1 week of pre-testing, the 3-step extension exercise 3 repetition for 10 days, 5 days in a week for 10-12 minutes was provided to staff nurses with mild to moderate low back pain.
• 15-30 seconds 3 repetition-Lying on stomach
• 1-2-minute 3 repetition- Prone on elbows

- 1-2-minute 3 repetition- Prone Press ups
- 30 seconds rest between each step

On 11th day post-test was done using numerical pain rating scale too assess the post-test level of low back pain among staff nurses.

ANALYSIS AND FINDINGS:

The data findings based on the objectives have been organized and finalized according to the plan for data analysis and are presented under the following sections.

SECTION 4.1: Description of demographic variables of the staff nurses with low back pain.

SECTION 4.1.A: Frequency and percentage distribution of demographic variables of the staff nurses with low back pain.

SECTION 4.2: Description of clinical variables of the staff nurses with low back pain.

SECTION 4.2.A: Frequency and percentage distribution of clinical variables of the staff nurses with low back pain.

SECTION 4.3: Assessment of pre-test and post-test level of low back pain among the staff nurses.

SECTION 4.4: Effectiveness of extension exercise on low back pain among staff nurses.

SECTION 4.4.1 A: Comparison of pre-test and post-test mean, SD, mean % to assess the effectiveness of extension exercise on low back pain among staff nurses.

SECTION 4.4.1 B: Comparison of pre-test and post-test mean, SD, to assess the effectiveness of extension exercise on level of low back pain among staff nurses.

SECTION 4.4.2 A: Paired "t" test to assess the effectiveness of extension exercise on low back pain among staff nurses.

SECTION 4.5: Association between level of low back pain with selected demographic variables.

SECTION 4.6: Association between level of low back pain with demographic variables.

SECTION 4.1: Description of demographic variables of the staff nurses with low back pain.

TABLE 2: Frequency and percentage distribution of demographic variables of the staff nurses with low back pain.

N=60

Sr. No.	Demographic variables	Frequency (f)	Percentage (%)
1.	**Age in years:**		
	21-30 years	31	51.7
	31-40 years	21	35
	41-50 years	8	13.3
	51-60 years	0	0
2.	**Sex:**		
	Male	2	3.3
	Female	58	96.7
3.	**BMI:**		
	<18.5	4	6.7
	18.5-24.9	40	66.7
	25.0-29.9	15	25

	30.0-34.9	1	1.7
4.	**Dietary Habit:**		
	Vegetarian	8	13.3
	Non-vegetarian	50	83.3
	Eggetarian	2	3.3
5.	**Marital Status:**		
	Single	17	28.3
	Married	43	71.7
	Widower/widow	0	0
	Divorce/separated	0	0
6.	**Type of family:**		
	Nuclear family	27	45
	Joint family	32	53.3
	Extended family	1	1.7
7.	**Present working area:**		
	EMR	3	5
	DLX	1	1.7
	ENT	3	5
	FMW	5	8.3
	GYNEC	5	8.3
	ICU	17	28.3
	LR	10	16.7
	MMW	4	6.7
	ORTHO	4	6.7
	OT	7	11.7
	PEDIA	1	1.7
8.	**Total years of clinical experience:**		
	1-3 years	16	26.7
	4-6 years	15	25
	7-9 years	14	23.3
	>9 years	15	25
9.	**Designation:**		
	Nursing Officer	55	91.7
	Nursing In-Charge	5	8.3
10.	**Types of foot wear you wear**:		
	Shoes	36	60
	Slippers	5	8.3
	Others	19	31.7
11.	**How much distance you travel every day**		
	<1 km 2-3km	10	16.7
	4-5 km	22	36.7

	>5 km	7	11.7
		21	35
12.	**Which mode of transportation you used for travelling?** Auto rickshaw		
	Scotty	9	15
	Car	32	53.3 5
	By walking	3	10
	Bus	6	16.7
		10	

**SECTION 4.2:** Description of clinical variables of the staff nurses with low back pain.

TABLE 3: Frequency and percentage distribution of clinical variables of the staff nurses with low back pain.

Sr. No.	Demographic variables	Frequency (f)	Percentage (%)
1.	**How long do you have low back pain?**		
	<6 months	17	28.3
	7months -1 year	14	23.3
	13 months-2 years	14	23.3
	More than 2 years	15	25
2.	**Type of low back pain Do you have**:		
	Radiating	38	63.3
	Nagging pain	9	15
	Throbbing pain	13	21.7
	Others	0	0
3.	**How many hours feel low back pain per day**:		
	<1 HOUR	18	30
	1-2 HOURS	27	45
	3-4 HOURS	6	10
	Throughout the day	9	15
4.	**How frequent you experience the low back pain**:		
	Daily	28	46.7
	Sometimes	32	53.3
5.	**Which of the following factors often contribute to low back pain**:		
	Lifting patients		
	Standing for long time	3	5
	Transferring patients from bed to chair or bed to bed	54	90
	Any other	1	1.7 0
	Lifting patients & Standing for long time	0	3.3
		2	

6.	**What measures you take when you have low back pain:**		
	I don't do anything	59	98.3%
	Exercise and use back belt	0	0
	Restrict movement for sometimes at work place and home	1	1.7%
7.	**Do you adopt any occupational safety measures given by institution like?**		
	availing break during working hours utilizing sick leave/other leaves	10	16.7
	yearly health checkup None of the above if one or more specifies	3	5
		10	16.7
		36	60
		1	1.7
8.a	**Do you practice any exercise?**		
	Yes	14	23.3
	No	46	76.7
8.b	**If yes, what type of exercise you do:**		
	Walking	13	92.86
	Aerobics	1	7.14
	Jogging	0	0
	Gym	0	0
8.c	**What is the duration of your exercise per day:**		
	10-15 min	6	42.86
	16-20 min	3	21.43
	21-25 min	2	14.29
	26-30 min	3	21.43
9.	**Is the pain made worse by any of the following?**		
	coughing sneezing sitting	0	0
	Bending	1	1.7
	None of the above	6	10
	Sitting & Bending	31	51.7
		18	30
		4	6.67
10.	**Have you ever consulted to the doctor for low back pain?**		
	Yes		
	No		
		3	5
		57	95

SECTION 4.3: Assessment of pre-test and post-test level of low back pain among the staff nurses.
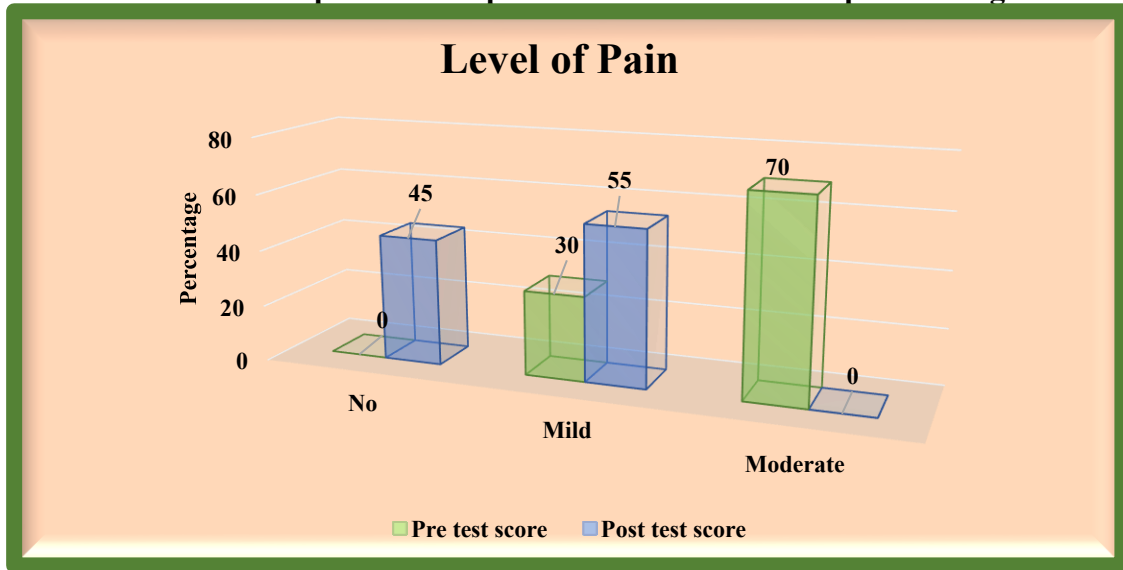
FIG.1: PERCENTAGE DISTRIBUTION OF PRE-TEST AND POST-TEST LEVEL OF LOW BACK PAIN AMONG STAFF NURSES

SECTION 4.4: Effectiveness of extension exercise on low back pain among staff nurses.

TABLE 4 : Comparison of pre-test and post-test mean, SD, mean % to assess the effectiveness of extension exercise on low back pain among staff nurses.

Variables	Pre-test Pain score				Post-test Pain score			Effectiveness in Mean %
	Max score	Mean	SD	Mean%	Mean	SD	Mean%	
Level of pain	10	4.23	1.12	42.3	0.95	1.03	9.5	32.8

TABLE 5: Comparison of pre-test and post-test mean, SD, to assess the effectiveness of extension exercise on level of low back pain among staff nurses.

LEVEL OF PAIN	Pre test score		Post test score	
	Mean	SD	Mean	SD
No	0	0	3.22	0.64
Mild	2.83	0.38	5.06	0.66
Moderate	4.83	0.73	0	0
Severe	0	0	0	0
Overall	60	100	60	100

TABLE 6: Paired "t" test to assess the effectiveness of extension exercise on low back pain among staff nurses.

Variables	Pre-Score			Post-test			Difference in mean	't' test	p-value
	Mean	SD	Mean %	Mean	SD	Mean %			

Level of Pain	4.23	1.12	42.3	0.95	1.03	9.5	3.28	**43.48**	**1.671 at 0.05 level 3.234 at 0.001 level P<0.001 *** HS**

*-p<0.05 significant, **-p<0.001 & ***p,0.001 -highly significant

Table 6 indicates that: The obtained "t" value (43.48) was more than the table value. Hence, there was a high significant difference between the pre-test and post-test level of low back pain among staff nurses. The significance difference was mainly because of the extension exercise.

Hence, the research hypothesis H1, the mean post test score of low back pain will be significantly lower than the mean pre-test level of back pain after extension exercise among staff nurses who had low back pain at the 0.05 level of significance was accepted.

The reduction in low back pain was seen after performing extension exercise.

SECTION 4.5: Association between level of low back pain with selected demographic variables.
TABLE 7: ASSOCIATION BETWEEN LEVEL OF LOW BACK PAIN WITH SELECTED DEMOGRAPHIC DATA.
N=60

Demographic variables	χ2-value	p-value
1.Age in years: 21-30 years 31-40 years 41-50 years 51-60 years	2.41 (df=2)	0.299 NS
2.Sex: Male Female	0.908 (df=1)	0.340 NS
3.BMI: <18.5 18.5-24.9 25.0-29.9 30.0-34.9	0.556 (df=3)	0.907 NS
4.Dietary Habit: Vegetarian Non-vegetarian Eggetarian	1.07 (df=2)	0.585 NS

5.Marital Status: Single Married Widower/widow Divorce/separated	0.316 (df=1)	0.574 NS
6.Type of family: Nuclear family Joint family Extended family	2.38 (df=8)	0.303 NS
7.Present working area: DLX EMR ENT FMW GYNEC ICU LR MMW ORTHO OT PEDIA	5.05 (df=4)	0.888 NS
8.Total years of clinical experience: 1-3 years 4-6 years 7-9 years >9 years	2.24 (df=3)	0.543 NS
9. Designation: Nursing Officer Nursing In-Charge	2.37 (df=1)	0.126 NS
10. Types of foot wear you wear: Shoes Slippers Others	2.87 (df=2)	0.238 NS
11. How much distance you travel every day <1 km 2-3km 4-5 km >5 km	1.488 (df=3)	0.685 NS

12. Which mode of transportation you used for travelling? Auto rickshaw scotty Car By walking Bus	4.41 (df=4)	0.354 NS

*p<0.05 significant, ** p<0.01 & ***p<0.001 Highly significant.

SECTION 4.6: Association between level of low back pain with demographic variables.

TABLE 8: ASSOCIATION BETWEEN LEVEL OF LOW BACK PAIN WITH SELECTED CLINICAL VARIABLE.

N=60

Clinical variables	χ2-value	p-value
1.How long do you have low back pain: <6 months 7months -1 year 13 months-2 years More than 2 years	11.45 (df=3)	0.009** HS
2.Type of low back pain Do you have: Radiating Nagging pain Throbbing pain Others	1.21 (df=2)	0.546 NS
3. How many hours feel low back pain per day: <1 HOUR 1-2 HOURS 3-4 HOURS Throughout the day	4.62 (df=3)	0.202 NS
4. How frequent you experience the low back pain: Daily Sometimes Never	1.84 (df=1)	0.175 NS
5. Which of the following factors often contribute to low back pain: Lifting patients Standing for long time Transferring patients from bed to chair or bed to bed Any other Lifting patients & Standing for long time	4.00 (df=4)	0.261 NS

6. What measures you take when you have low back pain: I don't do anything Exercise and use back belt Restrict movement at work place and home	0.435 (df=1)	0.509 NS
7. Do you adopt any occupational safety measures given by institution like: availing break during working hours utilizing sick leave/other leaves yearly health checkup None of the above if one or more specifies	6.24 (df=4)	0.182 NS
8a. Do you practice any exercise? Yes No	0.63 (df=1)	0.424 NS
8b. If yes, what type of exercise you do: walking Aerobics Jogging Gym	3.94 (df=1)	0.047* S
8c. What is the duration of your exercise per day: 10-15 min 16-20 min 21-25 min 26-30 min	5.09 (df=3)	0.165 NS
9. Is the pain made worse by any of the following coughing sneezing sitting Bending None of the above Sitting & Bending	5.01 (df=5)	0.414 NS
10. Have you ever consulted to the doctor for low back pain? Yes No	0.016 (df=1)	0.897 NS

*p<0.05 significant, ** p<0.01 & ***p<0.001 Highly significant.

CONCLUSION:

The present study was conducted to assess the effectiveness of extension exercise on low back pain among staff nurses working in Shri Vinoba Bhave Civil Hospital, Silvassa. and it was concluded that there was a significant difference in the level of low back pain among staff nurses and it was mainly because of the extension exercise. Thus, the investigator concluded that the extension exercise was effective in reducing level of low back pain among staff nurses.

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