Original Research Article

Effectiveness of William's Flexion Exercises on Non-Specific Low Back Pain Among Nurses

Sulaiman. I [*1], Ananya Bera [2], Sahana. S [3], A. K. Vijay Krishna Kumar [4].

[*1] Associate Professor, Dr. B.R. Ambedkar College of Physiotherapy, Bangalore, Karnataka, India.

[2] BPT Intern, Dr. B.R.Ambedkar College of Physiotherapy, Bangalore, Karnataka, India.

[3] BPT Intern Dr. B.R.Ambedkar College of Physiotherapy, Bangalore, Karnataka, India.

[4] Principal, Dr. B.R.Ambedkar College of Physiotherapy, Bangalore, Karnataka, India.

ABSTRACT

Background: Non-specific low back pain is a condition characterized by symptoms that lack a specific cause or identifiable origin. This type of back pain affects individuals of all ages and is a major contributor to the global burden of disease. It is a component of an occupational ailment that poses a significant worldwide public health issue due to its high prevalence. Healthcare professionals are exposed to occupational risk factors that make them more susceptible to developing low back pain. The risk for developing low back pain is higher, in nursing. The William flexion exercises are specifically designed to enhance the flexion of the lumbar vertebrae while limiting lumbar extension. By performing these exercises, the goal is to strengthen the gluteus and abdominal muscles. The introduction of these exercises aims to educate patients on how to avoid lumbar extension, which can worsen low back pain. Regular performance of these exercises by patients leads to a reduction in pain, improved stability of the lower pelvis, and an increased range of motion.

Methodology: The study employed an experimental design and included a sample of 40 nurses selected through convenient sampling from hospitals in and around Bangalore. The primary outcome measures assessed in this study were the Visual Analogue Scale (VAS) and the Oswestry Disability Index (ODI).

Result: The study shows the statistically significant difference in pre and post-intervention of VAS and ODI with $p<0.001$.

Conclusion: The study shows that there is a significant difference on Pain and disability among nurses with the help of Williams flexion exercises.

KEYWORDS: Low Back Pain, William's Flexion Exercises, Nurses.

Address for correspondence: Sulaiman. I**,** MPT., Associate Professor, Dr. B. R. Ambedkar College of Physiotherapy, Dr. B. R. Ambedkar Medical College and Hospital, Bangalore, Karnataka, India.
E-Mail: sulaipt14@gmail.com

INTRODUCTION

Low back pain is one of the most common musculoskeletal disorders that result in disability and decreased productivity [1].

It is the most common reason for worker compensation, lost workdays, and reduced productivity. In the course of their lives, up to 84% of individuals will experience an episode, and up to 50% of those will have more than one episode [2].

Non-specific low back pain is a portion of an occupational disease that occurs due to its great prevalence. It is a global public health issue when it lacks a definite and well-defined

diagnosis, which accounts for around 90% to 95% of cases [3]. Treatment for non-specific low back pain centers on minimizing pain and its side effects because it lacks a pathoanatomical origin [4]. Long-term, non-specific back pain is still a typical issue that practitioners encounter [5].

The most important frontline healthcare professionals are nurses [6]. The quality of life and ability to work are both significantly impacted by low back pain in nurses, resulting in effects on their financial situation [7]. Low back pain is a major issue for nurses, especially those who work in hospitals. According to a survey, 77% of nurses will experience low back discomfort after a year on the job [4]. Low back pain patients are advised to perform Williams flexion exercises, also referred to as lumbar exercises. Dr. Paul C. Williams (1900–1988), an orthopedic surgeon in Dallas, first introduced the technique in 1937[8].

According to Williams, the intervertebral disc is stressed due to bad posture, which is the fundamental source of all pain. William's back pain exercises include pelvic tilt, partial sit-ups, single knee to chest, double knee to chest, hamstring stretch, seated trunk flexion, and a full squat. It was discovered that the experimental group had less back discomfort and more flexible hamstring, hip flexor, and lumbar extensor muscles. They were also discovered to have stronger abdominal muscles [9]. Our study is to find out the effectiveness of William's flexion exercises on non-specific low back pain among nursing professionals.

METHODOLOGY

Study Design: Experimental Study.

Sampling method: Convenient Sampling.

Sample size: 40 subjects.

Place of Study: Hospitals in and around Bangalore

Inclusion Criteria:

· Both Female and Male Nurses.

· Age – 25-50years.

· Pain for more than 3 Months.

· VAS score upto 6.

· Non-specific low back pain.

· Registered Nurse.

Exclusion Criteria:

· History of any spinal surgery.

· History of any lower extremities surgery.

· History of spinal stenosis.

· History of IVDP.

· Recent spinal fracture.

Outcome Measures:

· VAS- Visual Analogue Scale.

· ODI- Oswestry Disability Index.

Procedure: This study involves a four-week intervention with Williams flexion exercises, performed four times a week. The recommended duration for exercises is 10-20 minutes. Each exercise should be performed for 10 repetitions.

These exercises include Pelvic tilt, Single knee to chest, Double knee to chest, Partial sit up, Hamstring stretch, Hip flexor stretch, and Squat.

1. Pelvic Tilt: Lie on your back with knees bent; and feet flat on the floor flatten the small part of your back against the floor without pushing down with the legs hold for 5-10 seconds.

2. Single Knee To Chest: Lie on your back with knees bent and feet flat on the floor slowly pull your right knee towards your shoulder and hold for 5-10 seconds.

3. Double Knee To Chest: Begin as in the previous exercise after pulling the right knee to the chest and hold both knees for 5-10 seconds slowly lowering one leg at a time.

4. Partial Sits Up: Do the pelvic tilt and while holding this position slowly curl your head and shoulders on the floor. Hold briefly and return slowly to the normal position.

5. Hamstring Stretch: Start in a long sitting position with toes facing towards the ceiling and knees fully extended slowly lower the trunk forward over the legs keeping knees extended arms stretched over the legs and eyes focused ahead.

6. Hip Flexor Stretch: Place one foot in front of the other, with the left (front leg) knee flexed

and right (back leg) knee extended holding rigidly straight. Flex forward through the trunk until the left knee contracts the axillary fold (armpit region) repeat the right leg forward and left leg back.

7. Squat: Stand with two feet parallel about shoulders width apart, attempting to maintain the trunk as perpendicular as possible to the floor, eyes focused ahead and feet flat on the floor, the subject slowly lowers his body by flexing his knees.

Data Analysis and Interpretation: Statistics analysis of the data was done using SPSS 20.0. Descriptive. Statistics were expressed using mean, standard deviation, frequency, and percentage. Pre-post compassion of VAS and ODI was performed using a paired t-test. A p-value less than 0.05 was considered statistically significant.

Table 1: Showing age category of the nurses tested for the effectiveness of William's flexion exercise on non-specific low back pain.

Age category (in years)	Frequency	Percent
25-34	7	17.5
35-44	23	57.5
45-54	8	20
55 and above	2	5
Total	40	100

RESULTS

The study shows, majority of 23(57.5%) nurses belonged to age group 35-44 years, 8(20%) nurses belonged to age group 45-54 years, 7(17.5%) nurses belonged to age group 25-34 year and 2(5%) belonged to age group 55 years and above.
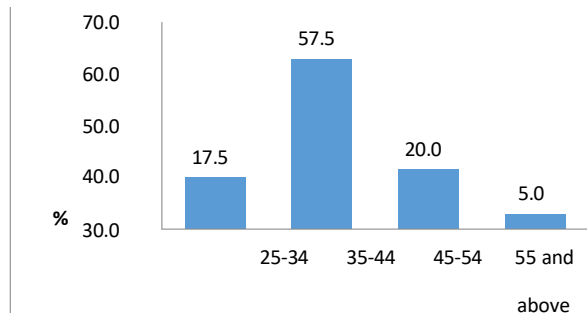

Fig. 1: Representing age category of the nurses.

Table 2: Showing weight, height, BMI of the nurses

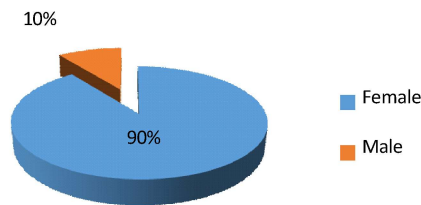|	Mean	Std. Deviation
Weight (in kg)	65.08	11.3
Height (in cm)	157.32	7.11
BMI	26.01	4.11

Gender

Fig. 2: Representing the gender of the nurses

The above table depicts, the mean weight of the nurses was 65.08±11.30 kg, the Mean height of the nurses was 157.32±7.11 cm and the mean BMI was 26.01±4.11.

Table 3: Showing pre-post comparison of VAS.

		Mean	Std. Deviation	Enhancement	t value	p value
VAS	Pre	5.48	0.85	0.807	11.53	p<0.001
	Post	4.67	0.94			

The average pre-VAS score was 5.48±0.85 which was reduced to 4.67±0.94 in the post intervention with a decrement of 0.807 and p<0.001.

The analysis shows a statistically significant difference in pre and post-intervention of VAS with p<0.001.
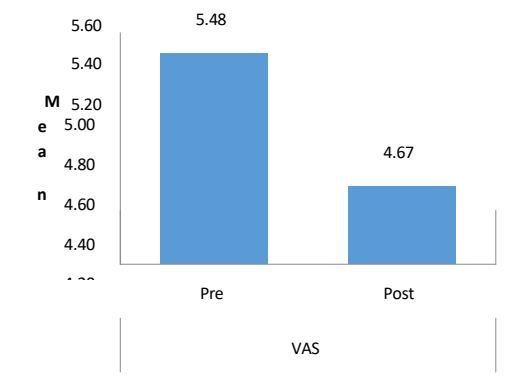

Fig. 3: Representing VAS score.

Table 4: Showing pre-post comparison of ODI score.

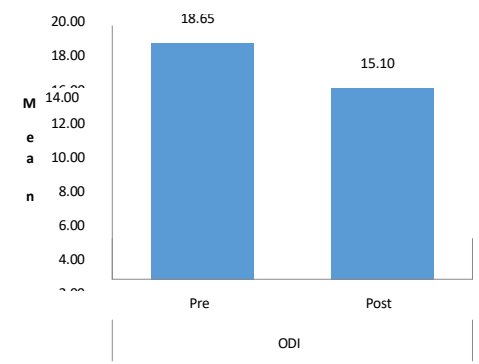|		Mean	Std. Deviation	Enhancement	t value	p value
ODI	Pre	18.65	5.56	3.55	10.28	p<0.0011
	Post	15.1	4.69			

Fig. 4: Representing ODI score

The average pre-ODI score was 18.65±5.56 which was reduced to 15.10±4.69 in the post intervention with a decrement of 3.550 and p<0.001.

The analysis shows a statistically significant difference in pre and post-intervention of ODI with p<0.001.

DISCUSSION

This study aims to find the effectiveness of the Williams flexion exercise in addressing non-specific low back pain among nurses. Previous studies show that Low back pain (LBP) is a significant issue that impacts the quality of life, work productivity, absenteeism, and disabilities in all the healthcare profession [10]. Data collected on occupational disorders show a high incidence of LBP among healthcare workers.

Another study has determined that William's flexion exercises effectively reduce pain intensity from moderate low back pain (LBP) to mild pain. This research was conducted by a team of researchers, including Qurat-ul-Ain and Iqra Ishaq[11]. This study has shown that implementing Williams Flexion Exercises (WFE) has a positive impact on lower back pain (LBP)[12]. The core principles of Williams Flexion Exercises involve facilitating lumbar flexion and strengthening abdominal and gluteal muscles to alleviate symptoms of lower back pain. Facilitating lumbar flexion can widen the intervertebral foramina and stretch the extensor muscles of the spine and the facet joints [13].

Our study shows that there was a statistically significant difference in the reduction of low back pain after William's flexion exercises among nurses with a p-value of less than 0.001.

Although some studies do prove that there is a significant efficacy of exercise therapy in selected cause of acute low back pain [14,15]. According to the previous study, patients with low back pain who participated in a four-week Williams Flexion Exercise program saw a significant improvement in their spinal range of motion and a reduction in discomfort [12]. Various studies also reported improvement in LBP after William's exercise [16]. The study's results suggest that William's Flexion Exercises

had a significant positive impact on reducing non-specific lower back pain and enhancing functional ability in the studied population. This implies that these exercises may be a valuable tool in the management of this common health issue, but further research is warranted to validate these findings and explore their applicability in different patient groups.

Recommendation: Based on this study, can be applied to address the underlying factors contributing to low back pain in various occupational fields.

Limitation: There were a few problems that we experienced due to their busy schedules, shift work, and reluctance to participate in studies. It has been challenging to find a representative sample of nurses. Self-reporting biases could make it more difficult to collect accurate data on NSLBP because nurses may over-report or underreport their pain in response to worries about their own comfort or job security.

CONCLUSION

The results of this study demonstrate that William's Flexion Exercises can be an effective means of reducing non-specific low back pain and enhancing functional ability. It can also be used as a home exercise programme for mild to moderate pain.

ABBREVIATIONS

LBP- Low Back Pain

VAS- Visual Analog Scale

ODI- Oswestry Disability Index

IVDP- Intervertebral Disc Prolapse

BMI- Body Mass Index

Conflicts of interest: None

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