

Effectiveness Of William's Flexion Exercises In Management Of Low Back Pain

Muhammad Usman Khalid¹, Mahvish Rafiq², Nosheen Zehra³

ABSTRACT

Background: Low back pain is a common musculoskeletal disorder affecting 84% people once in third life time. It may be acute or chronic. Among various available options for management of low back pain, William's flexion exercise is one of them. William's flexion exercises the set of physical exercises use to enhance lumbar flexion to avoid lumbar extension, and strengthen the abdominal and gluteus musculature to manage low back pain

Objective: To assess the effectiveness of William flexion exercise in management of patients with low back pain.

Methodology: A cross sectional study was conducted among 250 patients with low back pain from different hospitals of Karachi. Sample was selected by convenience sampling technique and data was collected on structured questionnaire. These patients were provided William's Flexion Exercise and changes in pain and posture were noticed before and after exercise. Data was analyzed by SPSS version 17 and P value <0.05 was considered as significant.

Result: Pain intensity was significantly (p value = 0.03) reduced in those who took more than 5 sessions of William's Flexion Exercise. Of total 96 (38.4%) patients with severe pain before exercise, no Pain was found in 20 (8%) patients after exercise. From 107 (42.8%) and 47 (18.8%) patients with moderate and mild pain respectively, no pain was found in 9 (3.6%) and 11 (4.4%) patients respectively. Spine flexion and extension was improved completely in 45 (18%) out of 132 (52.8%) patients with mild restrictions, in 24 (9.6%) out of 93 (37.2%) patients with moderate restrictions and in 9 (3.6%) out of 25 (10%) patients with severe restrictions.

Conclusion: William flexion exercise provided benefits to most of the participants in the study, thus it may be an effective technique to reduce the intensity of low back pain.

Key Words: *William's Flexion Exercise, Low Back Pain.*

INTRODUCTION

Participants Low back pain (LBP) can be defined as the pain and stiffness in lower back. LBP is a common musculoskeletal disorder affecting 84%¹ people at some point in their lives. LBP can affect both the gender.² Normally the pain is divided on the basis of its duration³. The pain lasting less than a week is called acute pain and the pain which lasting more than a week to months is called chronic low back pain.

The acute pain resolves within a week with specific treatment. If this pain is not treated then become chronic pain.⁴ A chronic low back pain disturbs the individual

during his working environment. Sometimes this pain becomes so severe that it will affect the daily activity.⁵ And for a while this pain becomes so extreme that person is unable to move and outcome is complete bed rest.

There are numerous structures that surround the lumber supine like ligament and muscles. Spine when loses its stability by straining of these structures results in back pain.⁶ The risk factors for straining are poor body posture, overweight and weak back and abdominal muscle.

Various treatment options are available for management of LBP.⁷ Short term use of pain and anti-inflammatory medications may help relieve the symptoms of lower back pain. NSAIDs are slightly effective for short-term symptomatic relief in patients with acute and chronic low-back pain without sciatica. Muscle relaxants for acute and chronic¹ pain have some benefit, and are more effective in relieving pain and spasms when used in combination with NSAIDs.⁸

Chronic use of these medications may result into various adverse effects. Certain medicines are unsafe during pregnancy and may cause side effects including drowsiness, or may lead to liver damage. So, due to these reasons non pharmacological treatment may be treatment of choice and beneficial for pain management.

¹ Muhammad Usman Khalid

Student of Post Professional Doctor in Physical Therapy, Ziauddin University

² Mahvish Rafiq

Student of Post Professional Doctor in Physical Therapy, Ziauddin University

³ Nosheen Zehra

Assistant Professor, Department of Community Health Sciences, Ziauddin University

Corresponding Author

Nosheen Zehra

During the past two decades, the advice for LBP given by primary care physicians has changed. Adams MA in his study recommended minimizing bed rest or stays active and to avoid bed rest.⁹

The rehabilitation program of chronic LBP is beneficial for the management of pain¹⁰. Exercise therapy, can be effective after the acute stage of LBP as well. The positive results have been known with specific types of exercise used by physical therapists.¹¹

Among these specific exercises, one is "Williams flexion exercises (WFE) also called Williams lumbar flexion exercises. These are the set of physical exercises use to enhance lumbar flexion to avoid lumbar extension, and strengthen the abdominal and gluteus musculature to manage low back pain.¹²

Scheermesser M, in his study found that physical therapy treatment can improve the patient ability to function¹³. The effectiveness of physical therapy can reduce the disability.¹⁴ The studies also showed that the patient totally dependent on medication may lead mild to moderate disability which can effect on daily activity. So role of physical therapy is also important in low back pain. Manual therapy is also more effective in low back pain. The aim of physical therapy treatment is to improve pain free activity of daily lining¹⁵

This study will help in identifying the effectiveness of William's flexion exercises. As this maneuver is among available management plans for LBP so the results of this study will help all health care providers to modify their practices. Most of the time doctors prescribed medications for LBP management but with the help of this research their knowledge regarding exercise based management of LBP will be improved. So the aim of this study is to assess the effectiveness of William flexion exercise in management of patients with low back pain.

METHODOLOGY

A cross sectional study, spanning over a year from February 2011 to January 2012, was conducted among patients of LBP. All those patients taking physical therapy treatment from different private and public hospitals of Karachi were included in the study.

Sample size was calculated by WHO sample size estimation calculator. For sample size calculation prevalence of LBP was taken as 80%, at 95% confidence level and keeping 0.05 margin of error. The minimum number of participants required for inclusion in the sample was calculated as 246 but 250 patients were included in the study.

Non-probability convenient sampling technique was used to enroll participants in the study. Patients aged between 18 to 90 years having LBM for at least three to four months but less than 9 months were included in the

study. Only those patients of LBP were be the part of study where LBP was associated with nerve root impingement at inter vertebral foramen, spinal tenosis and postural changes and they were declared medically fit by their doctors to undertake the exercise. Patients with any potentially serious pathology, who have spinal tumor, prior surgery back pain, and back pain start after road traffic accident, females with pregnancy and anyone who would have been unable to attend or participate in the exercise program were excluded from the study.

A brief history of patients was taken via interview and physically examination was done to exclude possible serious spinal pathology and collect baseline data by means of health measures. Data was collected on structured questionnaire enclosing questions targeting to assess the type, intensity, duration and pattern of pain. There were questions on relieving factors, occurrence of pain and the worse time of pain. As this study was aimed to assess the effectiveness of William's Flexion Exercises so there were questions on before and after results of exercise. We use visual analogue pain scale to measure the intensity of pain before and after the treatment, that is a simple assessment tool consisting of a 10 cm line with 0 on one end, representing no pain, and 10 on the other, representing the worst pain ever experienced.¹⁶ Location and type of pain was marked using the provided key as (0000 = Pins and needles, ////////////// = Stabbing, XXXX = Burning, ZZZZ = Deep Ache). In addition, we also evaluate patient's spine flexion and extension before and after the treatment and also analyze pain intensity after William flexion exercise. Purpose of the study was explained to participants and informed consent was taken before including these patients in the study.

Data was entered and analyzed by using SPSS version 17. Frequencies and percentages were calculated for qualitative variables while mean and standard deviation for quantitative variables. Chi square test was used to find association for qualitative variables and p vale <0.05 was considered as significant.

RESULTS

Total n= 250 patients were included in the study with mean age of 43 + 13 years. Out of them 90 (36%) were male and 160 (64%) were females. From the sample 124 (49.6%) patients were from private clinics, 85 (34%) were from private tertiary care hospitals and 41 (16.4%) were from government hospitals.

These patients were inquired about the characteristics of pain and it was found that 80(32%) had pins and needles type pain, 79(31.6%) had deep ache, 79 (31.2%) had burning pain, and 13 (5.2%) experienced stabbing pain. Among them 96 (38.4%) had severe pain, 107 (42.8%) had moderate pain and 47 (18.8%)

From the sample of 250, only 70 (28%) patients returned with complain of pain reoccurrence. Patients were also inquired about the improvement in their life quality, and 121 (48.4%) replied that there was complete improvement while 129(51.6%) said there was partial improvement.

DISCUSSION

Low back pain is such a common problem that every adult once in a life time affected by it. Nachemson A reported that about 80% people in their life experienced low back pain.¹⁷ Most of the time LBP is of acute type and resolve immediately or within few days but sometimes it is of recurrent type and in some individuals it becomes chronic.¹⁸ LBP is an important cause of activity limitation and according to Ponte DJ for every 100 subjects aged 25 to 44, an average of 28.6 works day are lost per year due to low back pain.¹⁹ Among various available options for management of LBP, William's flexion exercise may helps in improving LBP as reported in literature.^{20,21}

Therefore this study was focused in assessing the effectiveness of William's flexion exercise in management of patients with low back pain. Recent management guidelines for chronic LBP recommended exercise for returning to physical activity.²² Significant improvement in patients of LBP was reported in literatures who have received William's flexion exercises.²¹ Results of our study also supported that William's flexion exercise can lead to improvement in low back pain.

Exercise intervention with patient education, are first in the conservative approach to treat musculoskeletal conditions of the lumbar spine. By the exercise, body tissues adapt to the stresses and demands of everyday living. In most cases the back pain are mechanical in nature so, a functional approach will produce the long-term benefit.

According to the William's these exercises reduce the pressure on the posterior element of the lumbar spine. These exercises restore motion and strength of lower back is helpful in relieving pain and preventing reoccurrence of low back pain.^{20, 23} William's flexion exercises also strengthen the back and abdominal muscles which maintain the all structure alien and prevent the over loading of the posterior element of the lumbar spine.

Results of our study showed that William's flexion exercises had beneficial effect in chronic LBP which was measured by visual analogs scale (VAS) and spinal restriction observed before and after the treatment. Pain intensity when measured before therapy, reflected that 38% patients had severe, 43% had moderate and 19%

had mild pain. Improvement in pain after therapy was found in most of the case as of those with severe pain, 8% had no pain and 29% had mild pain. Similarly patients with moderate and mild pain also showed improvement as shown in table 3. In our study, patients were given number of William's Flexion exercise sessions and significant improvement (p-0.03) in pain intensity was found in those who took more than 5 sessions. Various studies also reported improvement in LBP after William's flexion exercise.^{20, 21,24}

Different patterns of William's flexion exercises were performed by patients with LBP as partial sit up, pelvic tilt, knee to chest, hamstring stretch, hip flexor stretch and squat. Participants reported that pelvic tilt, knee to chest and hamstring stretching gave them more relaxation and reduction in pain and squatting was more difficult for more individuals.

Along with exercise patient education is also very important. Posture is a vital component for the management of low back pain during the working environment and daily living.²⁵ In posture education we educated the patients regarding activity of daily living and postural improvement in occupation. After the complete session of treatment we gave a home exercise program with demonstration.

As this study was focused on effectiveness of William's flexion exercise and it was performed on patients with LBP. Although results of this study showed improvement in pain but there was no comparison group so findings may not prove cause effect relationship. On the other hand, this study will open future avenues for further research to do comparative analysis between William's flexion exercise and other management therapies.

The results of this study will also help those patients who are taking medication for management of LBP as this exercise helped patients effectively and not only reduce LBP but also improved daily activities. It is, therefore recommended to properly investigate and diagnosed patients with LBP and for those patients who require physiotherapy may be treated with William's flexion exercise. It is also suggested that preventive strategies should be introduced for managing LBP that will in return improve the daily pain free activities of individuals and reduce economic burden of society.

CONCLUSION

Results of our study highlighted that William's flexion exercise was beneficial for most of the participants in the study. This exercise with more than five sessions showed significant improvement in pain intensity. Along with improvement in pain intensity there was also improvement in spine flexion ad extension after this exercise.

REFERENCES

1. Wheeler G, Wipf E, Staiger O, Deyo R. Approach to the diagnosis and evaluation of low back pain in adults.[internet][cited 2012 April 5]. Available from: URL: <http://www.uptodate.com/contents/>
2. Youdas JW, Hollman JH, Krause DA. The effects of gender, age, and body mass index on standing lumbar curvature in persons without current low back pain. *Physiother Theory Pract* 2006; 22: 229-37.
3. Bogduk M. Management of chronic low back pain. *Med J Australia* 2003; 180: 79-83
4. May S. Handbook of Pain and Palliative Care. Biobehavioral Approaches for the Life Course. New York: Springer; 2012:231-45
5. Carita K, Katri L, Jouko SJ, Tuominen, Risto. Perceived relative importance of pain related function among patient with low back pain. *J Rehab Med* 2012; 44: 158-62
6. Tuchinsky D, Back pain: it's all in your neck, pine lake road suite 100 USA. Writers Club Press 2000:59-77.
7. Chou, Roger, Loeser, John, Owens, Dougl, Rosenquist. For the American Pain Society Low Back Pain Guideline Panel. Interventional Therapies, Surgery, and Interdisciplinary Rehabilitation for Low Back Pain: An Evidence-Based Clinical Practice Guideline from the American Pain Society 2009: 34; 1066-1077
8. Malanga GA, Dunn KR. Low back pain management: approaches to treatment. *J Musculoskel Med* 2010;27: 305-15.
9. Adams, May S, Freeman BJ, Morrison HP, Dolan P. Effects of backward bending on lumbar intervertebral discs. Relevance to physical therapy treatments for low back pain. *Spine J* 2000; 25: 431-8
10. Stéphane P, Marie DJ, Anne-Marie C, Tousignant, Michel. Guidelines on Low Back Pain Disability: Inter professional Comparison of Use between General Practitioners, Occupational Therapists, and Physiotherapists 2012; 37: 1252-9
11. Koumantakis G, Watson P, Oldham J Trunk Muscle Stabilization Training Plus General Exercise Versus General Exercise Only: Randomized Controlled Trial of Patients With Recurrent Low Back Pain *Phys Ther* 2005; 85: 209-25
12. Matsudaira K, Hara N, Arisaka M, Isomura T. Comparison of Physician's Advice for Non-specific Acute Low Back Pain in Japanese Workers: Advice to Rest Versus Advice to Stay Active. *Industrial Health* 2011; 49: 203-8
13. Scheermesser M , Bachmann S, Schämman A, Oesch P, Kool.J. A qualitative study on the role of cultural background in patients' perspectives on rehabilitation. *BMC Musculoskelet Disord* 2012; 13; 5
14. Kuczynski J, Schwieterman B, Columer K, Knupp D, Shaub L, Cook C. Effectiveness of physical therapist administered spinal manipulation for the treatment of low back pain: a systematic review of the literature. *Int J Sports Phys Ther* 2012; 7: 647-62.
15. Mannion FA, Caporaso F, Pulkovski N and Sprott H. Goal attainment scaling as a measure of treatment success after physiotherapy for chronic low back pain [internet]. [place unknown]. [updated April 27, 2010][cited February 2, 2010] Available from: <http://rheumatology.oxfordjournals.org>
16. The Visual Analogue Pain Scale. [internet] [cited 2013 Feb 23]. Available from: URL: http://www.fibroaction.org/Images/content/Pain_Assessment_VAS
17. Nachemson A: The lumbar spine: an orthopaedic challenge. *Spine* 1976; 159:71
18. Dunn KM, Croft PR. Epidemiology and natural history of low back pain. *Eur Med* 2004; 40:9-13.
19. Ponte DJ, Jensen GJ, Kent BE. A Preliminary Report on the Use of the McKenzie Protocol versus Williams Protocol in the Treatment of Low Back Pain. *JOSPT* 1984; 6: 130-9
20. Williams P. Examination and conservative treatment for disc lesions of the lower spine. *Clin Orthop* 1955; 528: 40
21. Williams P. Low Back and Neck Pain: Causes and Conservative Treatment. 3rd ed. Springfield: Charles C Thomas, 1974
22. Esther JO, Therapeutic Exercises in the Management of Non-Specific Low Back Pain.[online] [cited 2013 Feb 13]. Available from: URL: www.intechopen.com
23. Low back pain. American academy of orthopedic surgeon [Online] updated May 2009[cited 2013 Feb 22]. Available from: URL: <http://orthoinfo.aaos.org/topic.cfm?topic=A00311>
24. Ghiasi F, Mehraeen M. The effect of William's exercise on non-specific and chronic referral low back pain. *SID [online]* [cited 2013 Feb 12]. Available from: URL: www.sid.ir/en/ViewPaper.asp?ID=140699&varStr
25. Pillastrini, Mugnai R , Bertozzi L, Costi S, Curti S, Guccione A, etal. Effectiveness of an ergonomic intervention on work-related posture and low back pain in video display terminal operator. *Applied Ergonomics* 2010;41: 436-43