



Application of William's Flexion Exercise in Patients with Low Back Pain Problems: A Literature Review

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Abstract

This article aims to review the application of William's Flexion exercise in patients with low back pain problems. Low back pain is a clinical syndrome with the main symptoms of pain or discomfort in the lower back region which until now about 23% of adults in the world experience it. One of the physical therapies that can be used to treat patients with low back pain is William's flexion exercise which has been used for years and has been proven to relieve or relieve pain in patients with low back pain. This literature review aims to analyze the effect of applying William's Flexion exercise to patients with low back pain problems. Methods: This study explores quantitative evidence published in electronic databases such as Pubmed, and Google Scholar. Using a search strategy, we identified 32 articles with potential and relevant to the research objectives, but in this literature we only reviewed 5 articles. Results: We can see a significant effect on reducing the pain scale experienced by respondents after being given William's flexion exercise intervention. Conclusion: The results of a review of several articles in this review literature concluded that William's Flexion Exercise program was proven to be effective in reducing pain scales in patients with low back pain problems.

Introduction

Low back pain (low back pain) is a common disorder involving the muscles, nerves and spine. The pain you feel varies from mild to severe pain (National Institute of Neurological Disorders and Stroke, 2020). Most low back pain events have no clear cause, but are believed to be the result of less serious muscle or skeletal problems such as sprains or strains. (Borcuk, 2013).

Globally, up to 23% of adults worldwide suffer from chronic low back pain, with a recurrence rate of 24% to 80% within one year (Rhyu et al., 2015). According to WHO, about 33% of the population in developing countries experience low back pain persistently. In America 26% of adults reported experiencing LBP at least one day in a three month duration (Harahap, Marisdayana, & Hudri, 2018). In Japan, the prevalence of specific chronic LBP is 9.3% and non-specific chronic LBP is 15.4%. Meanwhile in Thailand, the prevalence of LBP is 30%, almost the same as the global prevalence. Meanwhile in Indonesia, the prevalence of LBP among the productive age group is almost 40% (Sukmajaya et., 2020).

Low back pain can cause a significant degree of disability and can be an ongoing problem, affecting almost every aspect of life. For example, the body's function in carrying out daily activities becomes disrupted (Casiano et al., 2020). If not treated properly physiologically, low back pain will cause muscle tension, spinal ligament tension, abnormal pressure in the tissues,

isometric contraction of the back muscles (against resistance), which can result in a spinal nerve clamp or Herniated Nucleus Pulposus (HNP). This will cause disruption of activity and can lead to paralysis (Yundari & Mas, 2018).

The most common treatment for pain management in patients with low back pain is the administration of painkillers such as acetaminophen or NSAIDs. Muscle relaxants, gabapentin, topical analgesics and opioids (Casiano et al., 2020). However, the continuous use of the drugs can cause liver damage and drowsiness in the patient. Therefore, the use of physical therapy is indispensable in dealing with pain experienced by patients with low back pain problems. Physical therapy can increase the patient's ability to carry out bodily functions and can reduce disability. One of the physical therapies that can be used to treat patients with low back pain is William's Flexion exercise which has been used for years and has been proven to relieve or relieve pain in patients with low back pain. (Kumar et al., 2016).

William's flexion exercise, also called lumbar flexion exercise or William's exercise, was first developed by Dr. Paul William in 1937 for patients with chronic low back pain in response to his clinical observations that found that the majority of patients experiencing low back pain had degenerative vertebrae secondary to degenerative disc disease. (Sukmajaya et al., 2020).

These exercises were developed for men under 50 years and women under 40 who have excessive lumbar lordosis, whose radiographs show contrast lumbar segment interarticular space. This exercise program can reduce pain and provide stability to the lower shaft by actively developing the abdominal muscles, gluteus maximus, and hamstrings and passively stretching the hip flexors and lower back muscles (sacrospinalis). This exercise, too, can prevent future injuries (Fatemia et al., 2015). When doing William's flexion exercise, there is muscle strengthening as well as stretching of other muscles. When your back is flattened on the floor, table, or bed with your arms at your sides and your knees bent, your flat feet on the floor will strengthen your abdominal muscles because in this movement the muscles contract pressing the hands that are placed under your back. When both hands pull the knee towards the chest there will be a stretch in the muscles of the lower back. This is because in this movement the muscles in the back are pulled when lifting the head toward the chest. When reflecting one leg towards the thigh there is a contraction of the quadriceps femoris muscles of the quadriceps, but on the other hand there is an extension of the muscles at the back of the bicep femoris. When bending the body forward slowly until the palms touch the floor, there will be stretching of the back muscles, the hamstrings, namely the bicep femoris, and the calf, namely the gastrocnemius and stretching of the back and quadriceps, but in contrast there is a contraction in the thighs. back and on the abdominal muscles. During the sit-up exercise, the pelvis is found to be tilted and places the spine before the forward trunk displacement. Posterior pelvic tilt requires activity of the internal and external oblique muscles that help generate intra-abdominal pressure. The curling exercise produces lumbar flexion and provides maximum activity of the external abdominal muscles and rectus thereby reducing pain in the lower back. (Kumar et al., 2016). Based on the description in this introduction, this article aims to review the application of William's flexion exercise in patients with low back pain problems through a literature review.

Methods

The literature review was carried out by searching for results of scientific publications in the 2015-2020 period using the pubmed database and google scholar. In the pubmed database,

entering keyword 1 "low back pain" resulted in 38,772 articles. Keyword 2 "William's Flexion Exercise" found 11 articles. Then combining the keywords 1, and 2 "low back pain AND William's flexion exercise" found 8 articles. After searching for articles, then limiting the number of articles, LIMIT publication dates (2015-2020), obtained 3 articles. While a search through the Google Scholar data base entered the keyword 1 "low back pain", the results were 3,830,000 articles. Keyword 2 "William's Flexion Exercise" found 31,600 articles. Then combining the keywords 1, and 2 "low back pain AND William's flexion exercise" found 20,400 articles. Furthermore, there was a limitation on the number of articles LIMIT to date (2015-2020) and got 5,650 articles.

From all databases and other sources, 238 abstracts and titles were found according to the search method. Then delete some duplicate articles so, there are 137 articles left. The title is then filtered for relevance and citations for the remaining 76 articles. Of these, 52 articles were found that were considered to be directly related to the research question and had complete texts for review. Furthermore, an abstract review was carried out and a complete study was carried out based on the research objectives of the remaining 32 articles, but in this literature the author only reviewed 5 articles.

Results and Discussion

Low Back Pain

Low back pain is a disease that causes prolonged pain ranging from mild to severe when the muscles receive a static load repeatedly over a long period of time (musculoskeletal disorders) (National Institute of Neurological Disorders and Stroke, 2020).

In the case of low back pain, pain generally occurs after several movements, for example; lifting, turning or bending forward. These symptoms can appear immediately after these movements or after waking up the next morning. Symptoms are usually felt at a certain point until the pain spreads (Casazza, 2012).

Physical causes of low back pain include inflammatory disorders, malignancy, trauma, osteoporosis, nerve root compression, radiculopathy, plexopathy, degenerative disc disease, disc herniation, spinal stenosis, sacroiliac joint dysfunction, facet joint injury, and infection. While mechanical causes include genetic factors, injuries, problems with nerves and spinal cord, and non-spinal sources, such as: kidney stones, endometriosis, fibromyalgia, tumors, and pregnancy. (Casiano et al., 2020).

Recurrent back pain due to improper body mechanics can be prevented by avoiding jerking or back stretching movements, maintaining correct posture, and lifting objects properly. Many work-related injuries are caused or exacerbated by stressors such as heavy lifting, contact stress (repeated or constant contact between soft body tissues and hard or sharp objects), vibrations, repetitive movements, and awkward postures. (National Institute of Neurological Disorders and Stroke, 2020).

William's Flexion Exercise

William's flexion exercise is a set or system of physical exercises that aim to improve lumbar flexion, avoid lumbar extension, and strengthen the abdominal and gluteal muscles in an effort to manage low back pain without surgery. The exercise is performed in a supine position on the floor or other flat surface (Andreea & Adrian, 2012).

The goal of doing William's flexion exercise program is to reduce pain or soreness and provide lower trunk stability by actively developing the abdominal muscles, gluteus maximus, and hamstring, passively stretching the hip flexors and lower back muscles (sacrospinalis), and to

restore or improve the work balance between the postural flexor and extensor muscle groups (Lukluningsih, 2010).

While the benefits of William's flexion exercise program include: opening of the intervertebral foramen, stretching the ligamentous structures, disorders of the apophysis joint, effective abdominal exercises that emphasize lumbar flexion of the abdominal muscles, reducing pain or soreness, the hip flexor muscles (iliopsoas) can also be used. perform lumbar flexion (Andreea & Adrian, 2012).

According to William's, the flexion exercise program can reduce pressure on the posterior elements of the lumbar spine, as well as restore lower back movement and strength which helps in pain relief and prevents recurrence of low back pain. This exercise will also strengthen the back and abdominal muscles which maintain all foreign structures and prevent overloading of the posterior elements of the lumbar spine (Yundari & Mas, 2018).

The results of research conducted by (Kusuma & Setiowati, 2015) aims to determine the effect of William Flexion exercise in increasing the range of motion of the joints in the lumbar part of people with low back pain in the hospital. Mardirahayu Kudus Regency of Kudus Prov. Central Java Indonesia, with a sample size of 30 respondents. This research is a type of quantitative research using a pre-experimental research design with the One Group Pre-Post Design approach. The results showed that the william flexion exercise program could increase the range of motion with an average value of 15.1 fleksi flexion with a value of ($p = 0.000$), 13.5 ° extension, ($p = 0.000$), 10.3 ° abduction. , ($p = 0.000$), adduction 11.8° ($p = 0.000$). This means that william flexion exercise has an effect on increasing the range of motion of joints for people with low back pain.

Research result (Kumar et al., 2016) aims to evaluate the effectiveness of William's flexion exercises in the management of low back pain at ACS Medical College and Hospital India, with a total sample of 30 respondents. This research is a type of quantitative research using a pre-experimental research design with a One-Shot Case Study Design approach. The results showed that William's flexion exercise program had a significant effect in reducing pain intensity and increasing the range of motion of patients with low back pain ($p = 0.001$).

Research result (Yundari & Mas, 2018) aims to evaluate the effect of William's flexion exercise in reducing the intensity of LBP pain in wood carvers in the village of Mas Gianyar Bali, Indonesia, with a total sample of 20 respondents (10 intervention groups, 10 control groups). This research is a type of quantitative research using a Quasy Experimental design with a Pre-Post With Control Group Design approach. The results showed that the william flexion exercise given to the wood carvers significantly reduced the pain intensity experienced with a value of $p = 0.000$.

Research result Sari et al., (2019) aims to determine the effect of William's flexion exercise on the scale of low back pain in carving craftsmen at the Banjar Puaya company, Gianyar, Bali Indonesia, with a total sample of 30 respondents (15 intervention groups, 15 control groups). This research is a type of quantitative research using a Quasi Experimental design with a Pre-Post With Control Group Design approach. The results showed that in the intervention group the pain scale experienced by respondents was significantly reduced, while in the control group the pain scale experienced by respondents did not decrease significantly. This difference was statistically significant with a value of $p = 0.000$, meaning that there was an effect of William's Flexion exercise on reducing the lower back pain scale.

Recent research conducted by Lestari & Zulfikar (2020) aims to determine in general the effect of William's flexion exercise on the level of low back pain in nurses at Haji Medan Prov. North

Sumatra Indonesia, with a sample size of 39 respondents. This research is a type of quantitative research using a Quasi Experiment research design with the One Group Pre-Post Only Design approach. The results showed that there were differences in the pain scale experienced by respondents before and after being given William's flexion exercise, where before being given the exercise, the pain scale experienced by the respondents was an average of 3.82 (moderate pain), and after being given exercise, the pain experienced was reduced on average. -average 2.59 (mild pain) ($p = 0.000$).

Conclusion

Based on the results of several studies in the literature review, it appears that William's flexion exercise program is proven to be effective in reducing pain scales in patients with low back pain problems. It is hoped that health service agencies can facilitate service personnel, especially nurses, by providing training to increase knowledge and skills regarding physical exercise therapy in patients with low back pain problems, especially regarding William's Flexion exercise program.

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