



Effect of stretching program on low back pain and neck pain

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Abstract

Pain is the most symptomatic cause of the patient reporting to the medical profession. Every person has reported one in their lifetime about pain symptoms at medical consultancy. Neck and lower back are the commonest musculoskeletal related pain in all young adults. Stretching is the most used physical therapy among many in combination in the management of neck and back pain. However there is no clear studies that only discuss on effect of stretching program on neck and back pain. There for these is a short review on the aim to discuss the effectiveness of stretching program in neck and back pain. 5 highly relatable studies were selected for discussion in the present study. The study discussed the mechanism of active and passive stretching on pain. Study concluded that stretching is effective in treatment of neck and lower back pain as first line of treatment when the Cause is purely musculoskeletal. Thought desired changes can only be seen in long term bases and type of stretching programs

Keywords — stretching program, neck pain, lower back pain, musculoskeletal pain.

Introduction

Every person has at least once experience a pain in his or her lifetime. Pain is one amongst the most symptoms of discomfort in all normal as well as unhealthy population to consult the medical departments worldwide. There are different classification and presentation of pain as its origin and Cause. Present study will focus on the most commonly reported multifactorial neck and lower musculoskeletal pain in the normal health adults.¹

As reported neck and lower back pain is the most commonly reported pain in young adults, the Cause is multifactorial. First may be due to uncomfortable or unhealthy practice of activities of daily living. Additional in the working population sitting for long hours in computer workers, working in awkward posture or positions, directly starting with high task activities without warm up or stretching of muscle and joint mobility, performing repetitive manual task with minimal or no interval are some of the reasons. Neglecting the main cause the acute pain turns into long standing chronic pain is also common. This is due to neglecting the pain symptoms due to work or getting nondirected treatment management failure. Whatever be the reason it further leads to personal suffering disability and impairments in quality of work and in activities of daily life, placing a great socioeconomic burden on the patients, its family and society. This not only impacts the physical and psychological system, it also destabilizes the social and economical environment of the person. There are well known

impacts of neck pain and lower back pain due to occupations and of unorganised activities of daily living. The most leads in restriction in product full work or comorbidities that further restrict the high quality of life activities. Therefore various branches of the medical fields continually research on intervention and rehabilitation process of management of multifactorial neck and back musculoskeletal pain in normal as well unhealthy population. Different studies reported different strategies in reducing and controlling the pain yet there is dearth of knowledge in the topic “interventions of multifactorial musculoskeletal pain”.

In every medical field there are different updates in the treatment of pain management. From acute to chronic pain medicines work rapidly but some time get adapted by the internal environment or shows adverse effects. There for physical interventions is now being recommended in the pain as first line of treatment. There are different physical therapies studied that can be beneficial in the treatment of musculoskeletal neck and back pain. As in for the present study topic this includes single and combination of both musculoskeletal neck and back pain. The different physical therapies that have shown significant changes are physiotherapy exercise, stretching, strengthening exercises, basic manipulation and physiotherapy techniques. Though there are other physiotherapy interventions like electrotherapy, present study will only focus on effect of stretching in neck and back pain. Aim of the present study will be to have a short

review on to discuss based on recent articles on effect of stretching in lower back and neck pain. The primary objective of the study is to discuss the effect of stretching exercise in neck and back pain based on the recent evidence available.

Study Material and Methodology

For the present study key words were selected as stretching, neck pain, back pain, musculoskeletal pain. The articles were searched by key words in the google scholar and pub med search engines. Scopus and PubMed were the index article criteria to include the articles. At first 110 article were traced, of which 105 articles were excluded as for not fulfilling the inclusion and exclusion criteria. Inclusion criteria stated to have articles of musculoskeletal origin or physical activity like work origin Cause. The age of the subjects in the study article should be 18 to 60 years old. The study subjects should be from the working area. The study should include stretching as the primary intervention. The exclusion criteria were to have no studies that include combination of electrotherapy or any other medical treatment that may not give proper ideas on effect of stretching exercise on neck and back pain. Exclusion was also based on if any study article included history of comorbidities in their studies during intervention. The study also excluded research articles that do not specifically explain the mechanism of the effect of stretching in neck and back pain.

Five articles were selected for the discussion on the basis of inclusion and exclusion criteria in the present study. Of these articles data was placed in tabular format for easy understanding and discussion. In the present study we targeted articles that had stretching exercise of head, neck, shoulder, back and lower region.

Result and Discussion

Due to the preset stress full work environment ever other person has reported neck or back pain due to work in his or her lifetime. These work related musculoskeletal pain in neck or back is the most common condition in all musculoskeletal or work related pain. This further not only impacts the physical state of the person also personal, psychological, and social life is disturbed. In working population in also affects as increase their financial burden due to work compromising, work compensation and medical expenses. This can also be the case of general population due to unhealthy styles of lying and unhealthy practice of any physical activity or activities of daily living. Overstrained activities and uncomfortable ergonomic postures also increase musculoskeletal pain symptoms. As stated by publishes researchers on self-assessed musculoskeletal pain neck and shoulder and back pain is the most common.

As on the previous literatures there are different physical therapy interventions on the musculoskeletal related neck and back pain. Most commonly practice are strengthening exercises, stretching exercise, general mobility exercise and manipulation by the physical therapist in the clinic. In the present study we assessed different studied that explained

significant effects of stretching on musculoskeletal neck and back pain.

In the present study evaluated regular stretching exercises programs during any work or at work place improves flexibility that may prevent musculoskeletal neck and or back pain. This further improvement id flexibility can reduce mechanical or occupational types of injury during and activity or work. Many studies suggested that those practice regularly stretching program pre workout or during the work activities with specific interval have shown reduce in mechanical or work related musculoskeletal injuries and pain. Regular stretching program in computer worker or any other skill working activity also reduces stress, increases personal value and maintain concentration level. Regular stretching programmes also improves range of motion or mobility of the joints This demonstrated enhanced power and upmost skill used for work activity to give best productive outcome also reduce early fatigue and cost saving in terms of medical. Yet no studies exclusively explained only stretching effects and hade combination of other exercises. Previous studies also of the consideration that stretching alone cannot have a significant impact in prevention but should also have combination therapies also as worm up, coordination, balance and weight training and strengthening programs. therefore we suggest there should be more studies that explain further mechanism of stretching program as a regular practise and how can it prevent many musculoskeletal injuries and or pain.³

Published studies suggested that stretching program is effective in reducing neck and lower back pain in working population by reducing the strain in the neck and back region. In addition it also improves mobility of upper body and health related perceived interference of pain and physical functioning in relation in quality of life. Studies demonstrated that stretching program that included stretching of all region as head, neck, shoulder, back and lower limb could target posture and movement control of the head, neck, shoulder, back and lower limb were more effective then particular region stretching.⁴

Although the Cause of musculoskeletal neck and back pain in multifactorial not all have be discovered. As a reason of physical limitations tight head-neck- shoulder muscle foe neck region and quadriceps and hamstring muscle for back region are specific risk factors of neck and lower back pain. Decreased extensibility of this muscle negatively influences on the mobility and join of the covered region leading impacts on posture. A study on intervention as stretching has suggested that active and passive stretching have different effects on the muscle. Dynamic stretching will incorporate movements that mimic a specific sport or exercise in an exaggerated yet controlled manner giving warmup like effects. This includes increase in heart rate and muscle temperature. Were static stretching will relax muscle and increase its extensibility. Its is further subdivided as active stretching and passive stretching. Active stretching aims to relax the muscle by relaxation of the contractile tissue of a muscle via relax inhibition through contraction of the antagonist muscle. Passive stretching intern will increase the extensibility of the non-contractile tissue of the muscle. This is done by application of sustained, continued stretch without contraction. The study concluded that regular

stretching of the muscle regardless of active or passive mode of stretching should significant improvement in all participants. Passive stretching showed decreases in stiffness in non-contractile muscle tissue improving the extensibility of connective tissue and nerves tissue increasing muscle length. Active stretching also impacted in change in pelvic tilt position, resulting in an increase extensibility of the hamstring muscle. This stretching when done to all muscle it increase mobility of entire spinal region as well of the hip region. There for improving of spinal and hip mobility plays important role in decreasing lower back pain. Study also suggested that passive stretching decreases the level of cortisol and relive in mental stress in upper neck and shoulder muscle like trapezius muscle if any as it is continuously tensed in working and mobile using adults. The relive in mental stress further improve extensibility thereby increase free the range of motion and relive in neck pain. The study also suggested that it's a acute effect and to have long term effect the static stretching should be done on regular bases.⁵

Another study detailed on active and passive stretching. This study considered contract relax proprioceptive muscular facilitation stretching in different pain management and demonstrated increase in the pain threshold values in hamstring muscle. It also suggested that stretching may alter sympathetic and or parasympathetic balance and thus influence in pain perception. Muscle stretching can activate exteroceptive and cutaneous receptors of Pacinian and Ruffini receptors that will further lead to inhibition in sympathetic nerves system. Study also formulated that stretching increases parasympathetic reflex that increase muscle relaxation and decrease blood pressure and heart rate. Additionally interstitial type III and IV receptors increase efferent sympathetic nerve activity that induce the withdrawal of parasympathetic nerve activity. Also increased stimulation of parasympathetic nerves system stimulates noradrenergic system that modulate pain gives global analgesic effect. Another possible mechanism the study explained that a noxious stimulus such as stretching to or near to the point of discomfort could cause an inhibition of painful stimulus sensation through the endogenous pain modulatory pathway. We're passive stretching mechanism was not much explained, it said it is effective in chronic pain and can show effect in pain reduction by period of stretching timing. The study said minimum two to three time per day for 10 to 20 minutes program that may go up to 3 weeks to 3 months to see any desired change. multiple repetitions of short duration stretching bilaterally may benefit the individual in neck and lower back pain. finally, the study indicated that the duration and location of stretch are more important to consider for the efficacy to reduce the neck and lower back pain.⁶

Different studies mention in their discussion that regular self-stretching is beneficial in improving neuromuscular coordination and flexibility and reducing pain and muscle weakness. It also improves physical activity by encouraging correct posture of body and increasing muscle endurance.⁷

Stretching exercises can be further classified as passive-static passive-dynamic, active-dynamic and proprioceptive neuromuscular facilitation. Effects of all is similar. Mechanism of action in this study was explained in two approaches. One in which change in biomechanical properties of muscle tendon

unit leading reduction in passive stiffness of the muscle reduces pain. Second approach states stretch tolerance modifies the individuals pain perception. Together both approaches are beneficial in reducing the pain in neck and lower back pain. Regular stretching also demonstrated in a study to be beneficial in improving available range of motion. Also the study discussed as age increase there is reduction in fascia elasticity that leads to pain. Stretching exercises on biomechanical approach may reduce muscle tension on the nerve roots that may further reduce pain. It also suggested that stretching exercises could reduce the number of cross-links in collagen fibers, increasing the elasticity of passive tissue. In addition, stretching can help to comprehend the analgesic effect by sensorial approach. neurophysiological mechanisms also explained in reducing the pain by elongating nerve fibers that reduces fibrosis and adhesions between the surrounding connective tissue and neural tissue allowing better flushing of intraneural fluid, facilitating axoplasmic flow, interfascicular gliding minimizing the deposition of chemical sensitizers, resulting in pain relief.⁸

More over most of the studies have explained different approaches of pain relief in neck and lower back pain after stretching. These studies though demonstrated significant changes in pain after regular stretching more studies are required to explain the same. Studies have shown to have desired change duration and different stretching programs targeted to the entire individual is important.

Conclusion

The present study was a short review on effect of stretching in neck and lower back pain. Study found most relevant articles that gave border explanation exclusively on stretching in neck and lower back pain. Finally 5 articles were selected for the discussion. Various literatus were noted on mechanism of stretching and musculoskeletal pain management. The discussion concluded that stretching may be active or passive. Both types of stretching can be given for musculoskeletal neck and back pain until the individuals suffering from the acute or chronic pain is not contributed by any pathology underlying and is work or activity related musculoskeletal pain.

Reference

- [1] Cimmino, M.A., Ferrone, C. and Cutolo, M., 2011. Epidemiology of chronic musculoskeletal pain. *Best practice & research Clinical rheumatology*, 25(2), pp.173-183.
- [2] Woolf, A.D. and Pfleger, B., 2003. Burden of major musculoskeletal conditions. *Bulletin of the world health organization*, 81(9), pp.646-656.
- [3] Gasibat, Q., Simbak, N.B., Aziz, A.A., Petridis, L. and Tróznai, Z., 2017. Stretching exercises to prevent work-related musculoskeletal disorders: A review article. *American Journal of Sports Science and Medicine*, 5(2), pp.27-37.
- [4] Naraoka, Y., Katagiri, M. and Shirasawa, T., 2017. Effectiveness of a 12-week program of active and passive

- stretching in improving low back and neck pain in Japanese sedentary men. *Health*, 9(3), pp.493-505.
- [5] Han, M.J., Yuk, G.C., Gak, H., Suh, S.R. and Kim, S.G., 2014. Acute effects of 5 min of plantar flexor static stretching on balance and gait in the elderly. *Journal of physical therapy science*, 26(1), pp.131-133.
- [6] Behm, D.G., Kay, A.D., Trajano, G.S., Alizadeh, S. and Blazeovich, A.J., 2021. Effects of acute and chronic stretching on pain control. *Journal of Clinical Exercise Physiology*, 10(4), pp.150-159.
- [7] Wong, C.K., 2006. *The effects of soft tissue mobilization and self-stretch of the pectoralis minor muscle on rounded shoulder posture and lower trapezius muscle strength*. Touro University International.
- [8] Luís Felipe Câmara-Gomes et.al, Mechanisms of muscle stretching exercises for reduction of low back pain: narrative review, *BrJP* 5 (1) • Jan-Mar 2022