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Effectiveness of Pilates Versus Yoga in Patients with Chronic Mechanical Neck Pain: A Comparative Study

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Abstract: ***Background: The neck pain comes from multifactorial origin and affects approximately 70% of individuals at some point in their lives being considered a frequent problem of disability. Pilates has been widely used physical conditioning method that improves posture and develop body sense. Although the neck pain symptoms are common within the population, no study has investigated the effectiveness of the Pilates method as a possible treatment for neck pain. The aim this study is to assess the effectiveness of the Pilates and Yoga method on pain, function and quality of life in patients with chronic mechanical neck pain. Methodology: Thirty patients diagnosed with chronic mechanical neck pain were randomly assigned to receive Pilates exercises (group A) and Yoga exercises (group B). Outcome measures such as numerical pain rating scale and neck disability index was taken to assess pain and functional status respectively. The exercise program lasted for 3 weeks. Results: Neck disability index decreases significantly in the Pilates group {standard deviation (SD)13.66 vs. week 3(SD)12.16, and (p value <0.001)} and the Yoga groups {(SD)7.65 vs week 3 (SD)6.61, and p value (<0.001)}. Pain ratings also improved significantly and low numbers needed to treat were found. There were no differences in outcomes between the exercise groups or associated adverse effects (p value of group A vs. group B is 0.56). Conclusion: Pilates and Yoga group exercise interventions with appropriate modifications and supervision were safe and equally effective for decreasing disability and pain compared with the control group for individuals with chronic neck pain. Physiotherapy may consider including these approaches in a plan of care.***

Keywords: Chronic mechanical neck pain, Pilates, Yoga, NPRS, NDI

1. Introduction

Cervical pain is the commonest encountered problem in daily life. Some or other time two thirds of individuals experience cervical pain in life.[1,2] Prevalence is highest in middle age, with women being affected more than men. [3] It is the conditions that develop gradually or have a post-traumatic onset with the recurrent episodes are common. Cervical pain usually by medication resolves within days or weeks, but will recur to become chronic which only depends on the cause, but is thought to be about 10%.[1] Cervical pain causes severe disability in 5% of affected people.[2]

Cervical pain is defined as pain with a postural or mechanical basis, often called cervical spondylosis. It is different pain as of fibromyalgia. Nonspecific neck pain may include due to overused, emotional problems, smoking, poor job satisfaction, awkward work postures, poor physical work environment, and workers ethnicity may be associated with neck pain.[4] Disc degeneration was not identified as a risk factor.[4-5]

The Pilates training is designed to improve general body flexibility and health by emphasizing core strength, posture, and coordination of breathing with movement.[6] It improves posture by enhancing body awareness[7] and can be used as self exercise, and can be easily tailored for treatment of specific postural misalignments. This Neuromuscular re-education concepts are used to develop optimal coordination of three- dimensional breathing, balanced spinal curvatures and scapulo-thoracic connection.

Yoga was used as both overall and specific health ailments of physical, mental and spiritual exercise. Yoga therapy functions as a multimodal treatment by addressing muscular weakness, poor posture and inadequate flexibility and addressing to biomechanical imbalances contributing to pain. Yoga has been recommended as a complementary and integrative medicine therapy for decreasing various types of pain, including neck-related pain.[8-12] Yoga styles, such as Iyengar yoga and Ashtanga yoga, strongly focus on physical postures, while Kriya yoga, rely on meditation or breathing techniques.[13] In clinical research, all styles seem to be more or less equally effective.[14]

The Neck Disability Index (NDI) a patient's self-reported neck pain related disability. The NDI is oldest questionnaire for neck pain. It has been shown to possess high "test-retest" reliability. Cervical pain studies have shown significantly reduced Cervical ROM in flexion in patients with neck pain.[15] They found a considerable variability in their subjects in the amount of neck pain and disability due to chronic neck pain. Some studies have concluded that, the NDI does provide an accurate picture of chronic whiplash sufferers,

with psychological factors only moderately influencing NDI scores.[16]

2. Materials and Methodology

- Study type and Design: Comparative (longitudinal) study.
- Sampling Method: Simple Random sampling method.
- Sample size: 35 Subjects.
- Study duration: 21days
- Place of Study: MIP Physiotherapy Department, YCR Hospital, Latur.

Criteria of Study

Inclusion criteria
- Patients diagnosed with mechanical neck pain more than 3 months.
- Both males and females.
- Age between 20-45 year.

Exclusion criteria
- Neck pain patients secondary any other pathology.
- Trauma or disability in last 5 years.
- Non co-operative patients.
- Any surgical history affecting cervical pain

Outcome Measures

Numerical Pain Rating Scale (NPRS) is a measurement instrument that tries to measure a characteristic or attitude that is believed to range across a continuum of values and cannot easily be directly measured.
- Operationally a NPRS is usually a segmental numeric version of visual analog scale (VAS) in which a respondent select a whole number (0 to 10 integers) that best represents best intensity of his/her pain.
- The common form is a horizontal line bar. Similar to visual analog scale, NPRS is anchored by terms describing pain severity extremes.
- The patient marks on the line, at the point that they feel represents their perception of their current state.

Self reported Neck Disability Index (NDI) questionnaire
- NDI is a self-rated, functional status questionnaire with ten items including pain, personal care, lifting, reading, headaches, concentration, work, driving, sleeping and recreation.
- The NDI has sufficient support and usefulness to retain its current status as the most widely used self-report measure for neck pain.
- 0 points or 0 percent means : no activity limitations,
- 50 points or 100 percent means complete activity limitation.

A higher score indicates more patient-rated disability.

3. Procedure

Thirty patients diagnosed with mechanical Neck pain more than 3 months willing to participate after signed consent form, screened as per inclusion and exclusion criteria and were selected as subjects.

Subjects were randomly assigned to receive Pilate's exercises group (group A) and yoga exercises group (group B). The Pre and Post effect of these exercises on Pain by numerical pain rating scale (NPRS scale) and functional disability assessed by the Neck Disability Index (NDI). The exercise program lasted for 3 weeks 5 times weekly with 10 repetitions of each exercise, with each move held for 10 seconds. Subjects were evaluated at the start of the study and after completion of the 3-week exercise program.

Later data collected was taken for further analysis and interpretation.

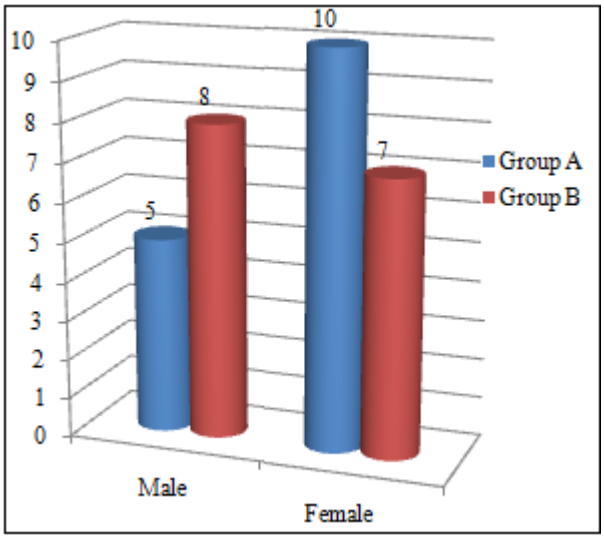
Group **A** received Pilates exercises:
1) Head node
2) Chin tucking
3) Arm opening
4) Roll up
5) Brest strokes

Group **B** received Yoga exercises:
1) Child's pose
2) Cat pose
3) Corpse pose
4) Cow pose
5) Bhardwaja's twist

4. Tables and Results

Table 1: Gender wise distribution

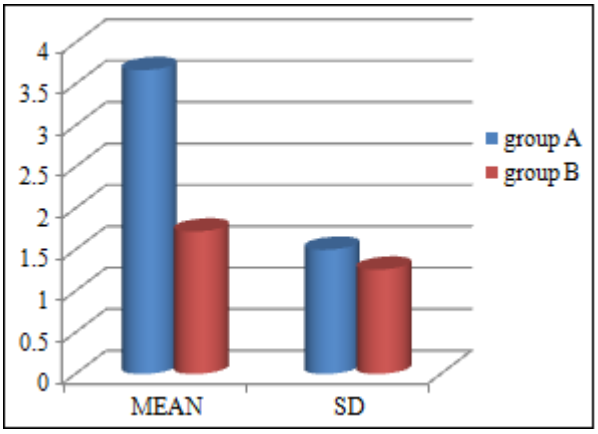
Gender	Group A	Group B
Male	5	8
Female	10	7



Graph 1: Showing Gender wise distribution

Table 2: Group A Versus Group B Post treatment NPRS

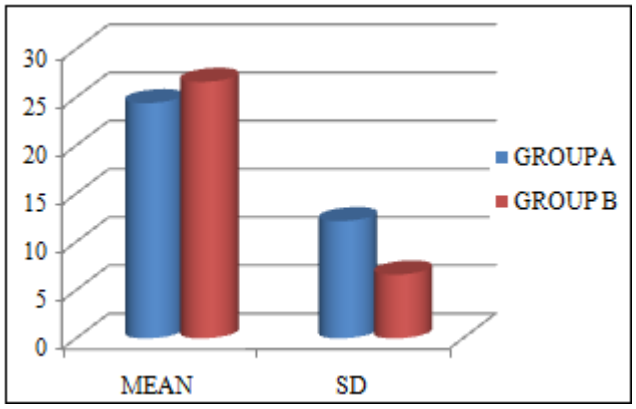
	MEAN	SD	T-TEST	p value
Group A	3.67	1.5	1.57	<0.12
Group B	1.72	1.26		



Graph 2: Showing Group A Versus Group B Post treatment NPRS

Table 3: Group A Versus Group B Post test NDI.

	Mean	SD	T-Test	p value
Group A	24.4	12.16	0.57	<0.56
Group B	26.6	6.61		



Graph 3: Showing Group A Versus Group B Post test NDI

5. Results

The comparison between readings of NPRS taken before and after the treatment in Group A patients (pre test mean 7.4±1.5 and post test mean is 3.67±1.72). As t-test value is 6.33 and p- value is <0.001 which represents there is significant improvement after treatment protocol.

The comparison between readings of NPRS taken before and after the treatment in Group B patients (pre test mean 6.8±1.01 and post test mean 2.8±1.26). As t-test value is 9.55 and p-value is <0.001 which represents there is significant improvement in treatment protocol.

Table 3 represents group A Versus Group B pre test NPRS (group A mean 7.4±1.5 and group B mean 6.8±1.1). T-test value is 1.28 and p-value is <0.2 which indicates there is no significant difference between pain rating scales of group A and group B patients.

The group A versus Group B post test NPRS (group A mean 3.67±1.5 and group B mean 1.72±1.26) as T-test value is 1.57 and p-value is <0.12.which indicates there is no significant difference between pain rating scales of group A and group B patients after treatment.

The comparison between readings of NDI taken before and after the treatment in group A patients. (pre test mean is 55.3±7.6 and post test mean 26.43±6.61). As T- test value is 11.05 and p- value is <0.0001 which indicates there is significant improvement after treatment.

The comparison between readings of NDI taken before and after treatment in group B patients (pre test mean 59.07±13.66 and post test mean 24.4±12.16). As t-test value is 7.34 and p-value is <0.0001 Which indicates there is significant improvement after treatment protocol.

The group A Versus Group B pre test NDI (group A pre test mean is 55.33±7.65 and group B pre test mean is 59.07±13.66). As t-test value is 13.66 and p-value is <0.36 which indicates there is no significant difference in NDI ratings of group A and group B patients.

Table 8 represents group A versus group B post test NDI (group A post test mean is 24.4±12.16 and group B post test mean 26.6±6.61). As t-test value is 0.57 and p-value is <0.56 which indicates there is no significant difference in NDI ratings of group A and group B patients.

There is no significant difference between group A and group B post treatment analysis.

The gender wise distribution in group A there were 5 males and 10 females and in group B there were 7 males and 8 females. Hence females are more prone to develop mechanical neck pain than males.

6. Discussion

The aim of this study was to investigate the effectiveness of pilates and yoga group exercises in the management of chronic neck pain. The results in a previous study suggested that both the treatment group has the improvement after treatment. Pilates and yoga includes a physical and mental focus using breathing control, postural alignment and flexibility through various exercises. Pilates stress on core stability and postural alignment, while yoga therapy includes specific postures, movement sequences, relaxation and meditation.

When we compared between readings of NPRS taken before and after the treatment in group A patients that is Pilates as the p-value is <0.001 which represents there is significant improvement after treatment protocol. In a similar study, Friedrich et al[5,20] reported that, improvement in back pain after 4-month of follow-up program. When we compared between readings of NPRS taken before and after the treatment in group B patients that yoga as the p-value is <0.001 which represents there is significant improvement in treatment protocol. According to the result, yoga had a positive effect on neck pain. Previous studies have shown, however, that Indian studies on yoga tend to be more positive effect on the musculoskeletal pain.[18]

In this study group A Versus Group B pre test NPRS p-value is <0.2 which indicates there is no significant difference between pain rating scales of group A and group B patients. And post test NPRS p-value is <0.12 which indicates there is

no significant difference between pain rating scales of group A and group B patients after treatment. So both the groups are equal effect and no difference was found after treatment in the pain management.

When we compared between readings of NDI taken before and after the treatment in group A patients that is Pilates as the p- value is <0.0001 which indicates there is significant improvement after treatment. The results reported by Segal[6] & Emery et al[17] studies found that the Pilates method provides improved muscle range of motion, postural alignment, and flexibility of various joints even in younger and middle-aged individuals with no loss of flexibility and core muscle from the aging process.

When we compared between readings of NDI taken before and after treatment in group B patients as the p-value is <0.0001 which indicates there is significant improvement after treatment protocol. Studies indicate that different yoga exercise programmes including low load endurance, scapular muscle re-training, cervical, scapulothoracic and upper quarter strengthening or stretching are mostly used for management of chronic neck pain.[5]

In this study group A Versus Group B pre test NDI shows the p-value is <0.36 which indicates there is no significant difference in NDI ratings of group A and group B patients. And group A versus group B post test NDI shows the p-value is <0.56 which indicates there is no significant difference in NDI ratings of group A and group B patients. The beneficial effects of Pilates and yoga exercises on pain and related disability have been shown previously.[6,19]

There is no significant difference between group A and group B post treatment analysis.

In our study we concluded that gender wise distribution in group A there were 5 males and 10 females and in group B there were 7 males and 8 females. Hence females are more prone to develop mechanical neck pain than males**.**

7. Conclusion

Study failed to accept the null Hypothesis as pre and post examination statistical analysis from both the interventions show significant decrease in mechanical neck pain in all the subjects. No significant difference obtained on comparison between two groups A and B. Both methods found to be equally effective and shown no harmful effects so can be prescribed in routine practice as well. And females are more affected than males.

8. Suggestion

Both Pilates and Yoga found to be equally effective and shown no harmful effects so can be prescribed in routine practice.

9. Conflict of Interest

There is no conflict of interest.

References

[1] Makela M, Heliovaara M, Sievers K, et al. Prevalence, determinants, and consequences of chronic neck pain in Finland. *Am J Epidemiol* 1991;134:1356–1367.[PubMed].

[2] Cote P, Cassidy D, Carroll L. The Saskatchewan health and back pain survey: the prevalence of neck pain and related disability in Saskatchewan adults. *Spine* 1998;23:1689–1698.[PubMed].

[3] Fejer R, Kyvik KO, Hartvigsen J. The prevalence of neck pain in the world population: a systematic critical review of the literature. *Eur Spine J* 2006;15:834–848.[PubMed].

[4] Cote P, van der Velde G, Cassidy JD, Carroll LJ, Hogg-Johnson S, Holm LW, Carragee EJ, Haldeman S, Nordin M, Hurwitz EL, Guzman J, Peloso PM. The burden and determinants of neck pain in workers: results of the Bone and Joint Decade 2000–2010 Task Force on Neck Pain and Its Associated Disorders. Spine 2008;33(4 Suppl):S60–74.

[5] Hogg-Johnson S, van der Velde G, Carroll LJ, Holm LW, Cassidy JD, Guzman J, Cote P, Haldeman S, Ammendolia C, Carragee E, Hurwitz E, Nordin M, Peloso P. The burden and determinants of neck pain in the general population: results of the Bone and Joint Decade 2000–2010 Task Force on Neck Pain and Its Associated Disorders. Spine 2008;33(4 Suppl):S39–51.

[6] Segal NA, Hein J, Basford JR: The effects of Pilates training on flexibility and body composition: an observational study. Arch Phys Med Rehabil, 2004, 85: 1977–1981. [Medline] [CrossRef].

[7] Kuo YL, Tully EA, Galea MP: Sagittal spinal posture after Pilates-based exercise in healthy older adults. Spine, 2009, 34: 1046–1051. [Medline] [CrossRef].

[8] Wallwork SB, Butler DS, Wilson DJ, et al. Are people who do yoga any better at a motor imagery task than those who do not? Br J Sports Med 2015;49:123–7.

[9] Cochrane Library, Cognitive-behavioural treatment for subacute and chronic neck pain. Accessed February 12, 2016.

[10] Cramer H, Lauche R, Haller H, et al. I'm more in balance: a qualitative study of yoga for patients with chronic neck pain. J Altern Complement Med 2013;19:536–42.

[11] Schmid AA, Miller KK, Van Puymbroeck M, et al. Yoga leads to multiple physical improvements after stroke, a pilot study. Complement Ther Med 2014;22:994–1000.

[12] Cramer H, Lauche R, Hohmann C, et al. Yoga for chronic neck pain: a 12-month follow-up. Pain Med 2013;14:541–8.

[13] Cramer H, Klose P, Brinkhaus B, et al. Effects of yoga on chronic neck pain: a systematic review and meta-analysis. Clin Rehabil 2017;31:1457–65.

[14] Cramer H, Lauche R, Langhorst J, et al. Is one yoga style better than another? A systematic review of associations of yoga style and conclusions in randomized yoga trials. Complement Ther Med 2016;25:178–87.

[15] Dr.Pallavi Dangat, Sanika Rane, Vishwanath Pawadshetty, Deepali Hande: The Effectiveness of Kinesiotaping on Pain and Disability in Cervical

Myofascial pain Syndrome- A comparative study.OIIRJ. 2020;10(1):1-6.
[16] Vernon H, Guerriero R, Kavanaugh S, Soave D, Moreton J. Psychological factors in the use of the neck disability index in chronic whiplash patients. Spine. 2009; 35(1):E16 - E21.
[17] Emery K, De Serres SJ, McMillan A, et al.: The effects of a Pilates training program on arm-trunk posture and movement. Clin Biomech (Bristol, Avon), 2010, 25: 124–130. [Medline] [CrossRef].
[18] Cramer H, Lauche R, Langhorst J, et al. Are Indian yoga trials more likely to be positive than those from other countries? A systematic review of randomized controlled trials. Contemp Clin Trials 2015; 41:269–72.
[19] Mallin G, Murphy S. The effectiveness of a 6-week Pilates programme on outcome measures in a population of chronic neck pain patients: a pilot study. J Bodyw Mov Ther 2013; 17: 376–384.
[20] Friedrich M, Gittler G, Halberstadt Y, Cermak T, Heiller I. Combined exercise and motivation program: effect on the compliance and level of disability of patients with chronic low back pain: a randomized controlled trial. Arch Phys Med Rehabil 1998;79:475-87.