

Effectiveness of scapular stabilization exercises versus dynamic neck exercises on chronic non-specific neck pain among male computer professionals

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Abstract

Introduction: Neck pain is an unpleasant sensory experience in the neck which may be manifested as fatigue, tension or pain that radiates to the shoulders, upper extremities or head. Non-specific Neck Pain (NsNP) refers to neck pain (with or without radiation) whose underlying cause cannot be traced to any specific systemic disease. To ensure normal muscle function during scapular motion, the main intervention goal is to inhibit over-activation of the upper trapezius and to enhance the weakened lower trapezius and serratus anterior muscles. Scapular stabilization exercises focused on enhancing the periscapular muscles, such as the serratus anterior and the middle and lower trapezius muscles to reduce Non-specific Neck Pain (NsNP).

Aim and objective: Aim of the study is to compare the effectiveness of scapular stabilization exercises versus dynamic neck exercises on pain, functional disability and

range of motion in subjects with chronic non-specific neck pain among male computer professionals.

Methods : 60 subjects who were diagnosed with chronic non-specific neck pain were selected from the outpatient departments of KIMS General Hospital, Amalapuram. The study was conducted during the period between July 2020 and June 2021 (1 Year). Quasi-experimental study. 3 days in a week for 4 weeks.

Results: All 60 subjects completed the entire study program as defined by 4 weeks in the outpatient basis. To observe the treatment impact before and after the treatment in the groups, analysis is carried out by using Paired t-test.

Conclusion: Scapular stabilization exercises are effective in reducing pain, improving cervical range of motion and functional activity in male computer professionals with Chronic non-specific neck pain. However, dynamic neck exercises are more effective in improving cervical range

of motion and functional activity in male computer professionals with Chronic non-specific neck pain as compared with scapular stabilization exercises.

Keywords: Non- specific Neck Pain (NsNP), dynamic neck exercises, cervical range of motion, functional activity, scapular stabilization exercises.

Introduction

Neck pain is an unpleasant sensory experience in the neck which may be manifested as fatigue, tension or pain that radiates to the shoulders, upper extremities or head. Non- specific Neck Pain (NsNP) refers to neck pain (with or without radiation) whose underlying cause cannot be traced to any specific systemic disease. Nonspecific neck pain may be attributed to numerous structures in the neck and surrounding regions, such as the muscles, joint structures, ligaments, intervertebral disks, and neural structures [1].

The International Association for the Study of Pain (IASP) in its classification of chronic pain defines cervical spinal pain as pain perceived anywhere in the posterior region of the cervical spine, from the superior nuchal line of the first thoracic spinous process. Neck pain is the sensation of discomfort in the neck area it can result from disorders of any of the structures in the neck, including the cervical vertebrae and intervertebral discs, nerves, muscles. A common cause of neck pain is muscle strain or tension [2].

The course of the neck pain is often characterized by exacerbations, a decreased range of motion of the cervical spine, development of chronic symptoms of pain lasting more than six months and weak neck-muscle. These are more common among women than men and they are also related to functional limitations, disabilities and impairments [4]. Around 25% of sick leaves are directly related to musculoskeletal pain [4]. Persistent pain can

reduce quality of life (QOL) of patients and cause economic burden [5].

Rationale of study

A wide variety of treatment protocols for chronic non-specific neck pain are available, however, the most effective management remains an area of debate. This is because the value of most current protocols for this condition remain unverified [6]. The use of neck manipulations, mobilizations, education, acupuncture analgesics, massage, low- level laser and exercise therapy in the treatment of “non- specific” neck pain. They concluded that none of these active treatments were superior to any other in the short or long term and that no one treatment has been studied in enough detail to assess its efficacy or effectiveness adequately [7]. This study is to find out the effectiveness of scapular stabilization exercises versus dynamic neck exercises on pain, ROM, and functional disability on chronic non- specific neck pain among male computer professionals

Aims And Objective

Aim of the study is to compare the effectiveness of scapular stabilization exercises versus dynamic neck exercises on pain, functional disability and range of motion in subjects with chronic non- specific neck pain among male computer professionals.

Methodology

A Quasi-experimental study was conducted during the period between July 2020 and June 2021 (1 Year) duration of 3 days in a week for 4 weeks by using Convenient sampling. 60 subjects who were diagnosed with chronic non- specific neck pain were selected from the out patient departments of KIMS General Hospital, Amalapuram. Total of 60 subjects after fulfilled the inclusion criteria was taken by convenient sampling. All the subjects were explained about the condition and mode of assessment

and written informed consent were obtained from them and pre- test is done and divided into 2 groups (A and B) and subjects were scheduled to attend exercise session 5 days a week for 4 weeks.

Data Analysis

Data was entered in MS-excel 2007 and data was analysed using IBM SPSS (Statistical Package for the Social Sciences) software trail version 22.Relevalant statistical tests Statistical analysis was done using the using SPSS version 20 with significance level kept at 0.05 for this purpose the data was entered into Microsoft Excel spreadsheet, tabulated and subjected to statistical analysis.To observe the treatment impact before and after the treatment in the groups, analysis is carried out by using Paired t- test

Ethical Clearance

Ethical clearance taken from Ethical committee of KIMS Educational Institutions at Amalapuram and informed consent was taken from the study subjects before doing this study.

Results: Protocol For Group A:

Dynamic neck exercises:

- Cervical flexion, lifting head up with the chin tucked in from supine lying for neckflexion.

Legend Tables

GROUP - A				
SL.NO	VAS		NDI	
	Pre	Post	Pre	Post
1	7	4	20	7
2	6	3	18	6
3	7	3	18	5
4	6	2	16	6
5	8	4	20	8
6	6	3	18	6

- Cervical extension, lifting head backwards in prone lying for neck extension.
- Cervical side flexion, lifting head sideways from pillow in side lying position for neck side flexion which is also repeated for the other side
- Cervical rotation, lifting head off from the bed and rotating to one side for neckrotation, repeating both ways.

These exercises were performed for 10-15 repetitions ,as 3-5 sets ,3 times a week onalternate days [8].

Protocol For Group –B

Scapular stabilization exercises:

- 1) Push- up plus
- 2)Prone I
- 3)Prone Y
- 4)Prone T
- 5)Prone W

The general exercise frequency was 3 times per week. However, one study prescribed a once- daily frequency. The exercise intensity was described as repetitions, sets, and holding time. Commonly, 10- 20 repetitions and three to five sets held for 3- 10 seconds were performed. However, the exercise intensities progressively increased over the intervention period in only one study. The maximal intervention time was 30 minutes in two studies and 20 minutes in one study [4].

7	7	2	20	6
8	8	3	20	7
9	6	2	18	6
10	5	3	16	5
11	7	3	20	6
12	8	3	22	8
13	5	2	16	5
14	6	3	18	5
15	7	3	20	7
16	7	4	20	7
17	6	3	18	6
18	7	3	18	5
19	6	2	16	6
20	8	4	20	8
21	6	3	18	6
22	7	2	20	6
23	8	3	20	7
24	6	2	18	6
25	5	3	16	5
26	7	3	20	6
27	8	3	22	8
28	5	2	16	5
29	6	3	18	5
30	7	3	18	7

S.NO	Flexion		extension		RT lateral flexion		LT lateral flexion		RT rotation		LT rotation	
	pre	post	pre	post	pre	post	Pre	Post	pre	post	pre	Post
1	35	45	30	35	35	45	40	45	50	55	50	55
2	25	35	40	45	40	45	45	45	50	55	50	55
3	40	45	35	40	30	45	40	50	40	45	40	45
4	35	40	40	45	35	45	40	45	35	45	35	40
5	40	45	40	45	30	40	30	45	30	40	30	45
6	35	40	50	55	45	45	45	50	45	55	45	55
7	35	45	50	55	30	45	30	40	25	40	25	40
8	45	45	45	55	35	40	30	40	45	55	35	50
9	40	45	50	55	25	45	25	35	20	35	25	40
10	35	40	50	55	35	45	40	45	45	55	45	55
11	40	45	40	45	40	45	40	50	55	55	40	55
12	45	45	50	55	35	45	35	45	40	55	50	55
13	35	40	45	50	30	45	30	40	40	55	45	50
14	45	45	50	60	35	45	40	45	40	55	40	55
15	40	45	50	55	30	40	30	40	45	55	45	50
16	35	45	30	35	35	45	40	45	50	55	50	55
17	25	35	40	45	40	45	45	45	50	55	50	55
18	40	45	35	40	30	45	40	50	40	45	40	45
19	35	40	40	45	35	45	40	45	35	45	35	40
20	40	45	40	45	30	40	30	45	30	40	30	45
21	35	40	50	55	45	45	45	50	45	55	45	55
22	35	45	50	55	30	45	30	40	25	40	25	40
23	45	45	45	55	35	40	30	40	45	55	35	50
24	40	45	50	55	25	45	25	35	20	35	25	40
25	35	40	50	55	35	45	40	45	45	55	45	55
26	40	45	40	45	40	45	40	50	55	55	40	55
27	45	45	50	55	35	45	35	45	40	55	50	55
28	35	40	45	50	30	45	30	40	40	55	45	50
29	45	45	50	60	35	45	40	45	40	55	40	55
30	40	45	50	55	30	40	30	40	45	55	45	50

GROUP – B				
SL.NO	VAS		NDI	
	Pre	Post	Pre	Post
1	7	4	24	13
2	6	3	20	9
3	7	3	20	10
4	5	2	19	8
5	6	3	20	10
6	7	4	23	11
7	5	2	21	9
8	6	3	22	9
9	7	4	24	13
10	6	3	24	12
11	5	2	18	8
12	6	3	21	11
13	7	3	22	10
14	7	4	24	13
15	5	2	18	8
16	7	4	24	13
17	6	3	20	9
18	7	3	20	10
19	5	2	19	8
20	6	3	20	10
21	7	4	23	11
22	5	2	21	9
23	6	3	22	9
24	7	4	24	13
25	6	3	24	12
26	5	2	18	8
27	6	3	21	11
28	7	3	22	10
29	7	4	24	13
30	5	2	18	8

S.NO	Flexion		extension		RTlateral flexion		LTlateral flexion		RT rotation		LT rotation	
	Pre	post	pre	post	pre	post	Pre	Post	pre	post	pre	Post
1	35	45	40	50	30	40	30	35	40	50	45	50
2	25	35	55	60	35	40	35	40	45	50	40	50
3	40	45	55	60	30	40	30	35	40	45	35	45
4	35	45	60	65	35	40	35	40	40	50	40	50
5	40	45	35	45	40	45	45	50	45	55	50	55
6	30	35	50	55	45	45	40	45	45	55	50	55
7	35	40	50	55	30	35	30	35	35	45	35	45
8	45	45	45	50	35	40	35	40	40	45	40	45
9	40	45	35	45	30	45	30	45	50	55	45	55
10	35	40	35	45	30	45	30	45	35	45	35	40
11	40	45	65	70	40	45	40	45	50	55	50	50
12	45	45	55	60	45	45	45	50	50	55	45	55
13	35	40	40	45	45	45	45	50	50	55	50	55
14	35	45	45	50	40	45	40	45	45	50	45	50
15	25	35	60	65	35	40	35	40	45	50	45	50
16	35	45	40	50	30	40	30	35	40	50	45	50
17	25	35	55	60	35	40	35	40	45	50	40	50
18	40	45	55	60	30	40	30	35	40	45	35	45
19	35	45	60	65	35	40	35	40	40	50	40	50
20	40	45	35	45	40	45	45	50	45	55	50	55
21	30	35	50	55	45	45	40	45	45	55	50	55
22	35	40	50	55	30	35	30	35	35	45	35	45
23	45	45	45	50	35	40	35	40	40	45	40	45
24	40	45	35	45	30	45	30	45	50	55	45	55
25	35	40	35	45	30	45	30	45	35	45	35	40
26	40	45	65	70	40	45	40	45	50	55	50	50
27	45	45	55	60	45	45	45	50	50	55	45	55
28	35	40	40	45	45	45	45	50	50	55	50	55
29	35	45	45	50	40	45	40	45	45	50	45	50
30	25	35	60	65	35	40	35	40	45	50	45	50

Discussion

A total no. of 60 male subjects with chronic non-specific neck pain with mean age of (28.19) was constituted the sample of the study. The result of this study showed a significant reduction in pain, increase in ROM, and improvement in functional activities after 4 weeks of

protocol compared with pre and post treatment in both groups but there was a greater mean difference of significance in Group- A (Dynamic neck exercises) when compared to Group- B (Scapular stabilization exercises). The benefit of the dynamic neck exercises group over the scapular stabilization exercises in reducing their pain

levels ,improving range of motion and functional activity level is due to dynamic exercise has the advantages that, there is increased movement of the joint, resulting in capsular, ligament and muscular flexibility and increased cartilage nutrition. Muscle strengthening occurs in all joint ranges achieved during the exercise and results in functionally more efficient muscle- joint complex [9]. Randlov A et. al performed a study on “Intensive dynamic training for females with chronic neck/shoulder pain” showed that dynamic training program resulted in both subjective and objective improvements in patients suffering from chronic neck/shoulder pain [10]. In support to this, Berg HE et.al examine in their study whether dynamic neck resistance training could increase strength and reduce pain in workers with a high prevalence of neck disorders [11]. A similar study performed by Jari Ylien et .al in “ Active neck muscle training in the treatment of chronic neck pain in men” concluded that, both endurance training (dynamic neck exercises) and strength training (isometric neck exercises) were effective methods for decreasing the pain and disability in women with chronic, non- specific neck pain [12]. In favour of dynamic resistance program, some authors like Gary Kannen published in the chapter “Adaptations to exercise training” that either concentric or eccentric muscle contractions might be a part of the dynamic resistance exercise program. Concentric muscle contractions can offer very high forces and thus an appropriate overload stimulus. Eccentric contractions can actually produce more muscular force than that obtained during an isometric muscle contraction [13].

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