

Effectiveness of Swiss Ball Training Exercise for Tension Neck Syndrome among Goldsmith Workers

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Abstract:

Background: Tension neck syndrome is a disorder of neck and shoulder area are involved, also called Cervicobrachial. Goldsmith workers are used to working for long time with cross legged posture in their workstation.

Objective: This study was to find out the effectiveness of Swiss ball training exercises for tension neck syndrome among goldsmith workers using Swiss ball.

Methodology: The study design was Quasi experimental and the study type is pre and post test with twenty samples with age 30-45 years males with minimum six month of experience as Goldsmith workers with neck pain. Subjects are excluded who has any spinal deformity, vertebral fracture, trauma, etc., The goldsmith workers working in their workstation has only one group using Swiss ball. Neck disability index should be used to select the patient who have pain with limited movements in the neck. At pretest and post-test, the pain was assessed by using VAS(Visual Analog Scale) and the limitation of movements should be assessed by the using Goniometer by Observing the range of motion.

Outcome Measures: Numeric pain rating scale, Range of motion, Neck disability index(NDI)

Results: The data analysis reviewed that there is decreases in pain and stiffness using Swiss ball training exercises, this showed better results, therefore it is significant.

Conclusion: Strengthening the deep flexor muscles of the neck for stabilization using Swiss ball exercises was effective at reducing pain and stiffness.

Keywords: Neck Disability Index(NDI), Tension Neck Syndrome, Goldsmith Workers, Goniometer.

I. INTRODUCTION

Tension neck syndrome is a disorder of neck and shoulder area are involved which is also called Cervico-brachial. Goldsmith workers are used to working for long time with cross legged posture. These prolonged posture produces the defects on muscles, ligaments, and soft tissues in their body^{3,11}. The prolonged duration of sitting and concentrating causes severe neck pain and later affects the deep flexor muscles of the neck such as Longus Capitis and Longus Colli produces tightness due to repeated movements in neck can results in Tension neck syndrome^{3,11,9}. There is pain, tenderness, fatigue, stiffness in neck, shoulder musculature and spasm should be found. The Trapezius and

Sternocleidomastoid muscle which is frequently associated with pain. The muscles in the back resisting the gravity by pulling the head forward. But these pains in workers unconsciously develop forward head posture causes thoracic kyphosis on neck. These produces further damage in the structure of the neck^{3,4}. So the Goldsmith workers cannot able to concentrate on their work, this will reduce their working hours and extended the time to complete their final destination. The workers cannot able to focus on their work during pain. Their Range Of Motion also varies from the normal cervical range with limited movements. So limited movements should be possible due to structural damage of forward neck or kyphosis^{11,12}. However, the Goldsmith workers working for long duration their concentration may get divert due to the cervical area during pain. So the tension should be reduced by using Swiss ball training exercises because tight muscle cause imbalance in movements¹. Swiss ball is used for the spine health, core stability, better posture and muscle balance. It is a rehabilitation tool which is used to reduce the stiffness in deep flexor tendon muscles of the neck^{1,8,13}. Deep flexor tendon muscle get weakening due to long duration same posture of the neck. The Goldsmith workers having daily routine to work continuously for their daily purpose, these routine work increases the demand of the muscles which get into fatigue and overstretched. It can also affects the other daily activities such as driving, reading etc. Neck disability index is used to select the workers who have pain in neck and it is noticed that the workers having pain and stiffness in neck with limited Range Of Motion. It is only used for the workers to select whether there is any tension in neck, so we can select the workers easily. Numeric Pain Rating Scale is a scale in which there is an eleven point scale from 0 to 10 where “0 is no pain and “10” is the most intense pain. The NPRS has good sensitivity while producing data that can be statistically analyzed.

Aim of the Study

To find out the effectiveness of Swiss ball training exercises in Tension neck syndrome among Goldsmith workers.

Need for the Study

There are studies, that report the neck pain due to work related posture adaptation. Since there is less evident study that deals with pain reduction among Goldsmith workers. Thus this

study determines effectiveness of Swiss ball training in Tension neck syndrome among Goldsmith worker.

II. METHODOLOGY

The Study was of Quasi Experimental design and Pre& Post Test type conducted for a duration of 4 weeks. 20 Male Gold smith workers aged between 30 to 45 years having neck pain with a minimum work experience of 6 months were included in this study through convenient sampling from Theni District, Tamil Nadu. Workers with Vertebral fracture, any spinal deformity, Trauma, Recent Surgeries and Any Neurological disorders were excluded out of this study.

Procedure

The subject was selected bases on the inclusion and exclusion criteria. The consent form was obtained from the subject after the clear explanation of the study. Neck Disability Index (NDI) was provided to the subject and selection was done according to the score. The intensity of the pain and tension in neck was analyzed by Numeric Pain Rating Scale (NPRS) prior to the treatment. Goniometer was used to assess the

Range Of Motion of neck. The subject was performed the Swiss ball exercises such as neck flexion, neck extension, side bending or lateral flexion, neck rotation. The position was maintained for 10 sec hold in 1st 2 week, followed by the 15 sec hold in last 2 week. The exercises were performed for 3 days a week for 4 weeks with regular intervals. After the completion of 4 weeks Neck Disability Index (NDI), Numeric Pain Rating Scale (NPRS), and the Goniometer were to evaluate the Pain Rating Scale and the Goniometer were to evaluate the pain scoring for determining the effectiveness of the treatment.

OUTCOME MEASURES

NUMERICAL PAIN RATING SCALE, RANGE OF MOTION (ROM) and NECK DISABILITY INDEX (NDI)

III. STATISTICAL ANALYSIS

The IBM statistical package for social science (SPSS) version 20 for windows was used for data analysis. The statistical too used in this study was paired „t“ test used for analysis of pretest and post test was conducted for selected group.

TABLE-I
PRE AND POST-TEST FOR PAIN USING NUMERIC PAIN RATING SCALE

SCALE	N	TESTS	MEAN	SD	t value	P value
NPRS	20	PRE TEST	7.5500	.88704	17.967	0.000
		POST TEST	4.5000	.60698		

p<0.05

Table 1 shows that the mean values of NPRS of pre-test (7.5500) to post-test(4.5000)

GRAPH -I

PAIN IN NUMERIC PAIN RATING SCALE FOR TENSION NECK SYNDROME AMONG GOLDSMITH WORKERS

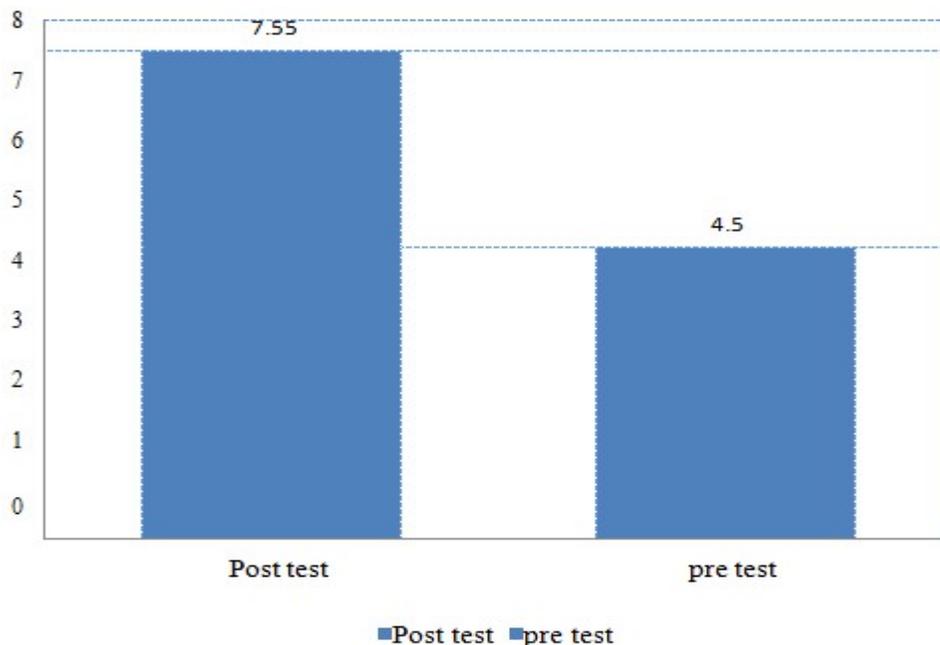


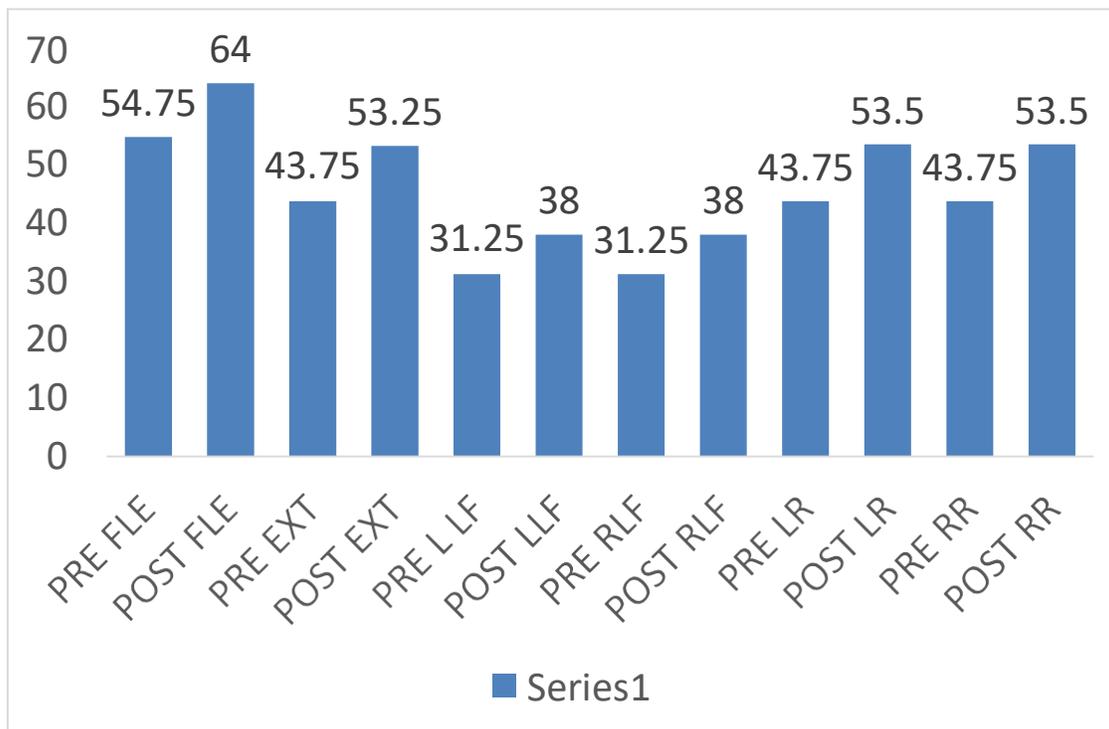
TABLE -II
PRE AND POST- TEST OF RANGE OF MOTION IN NECK USING GONIOMETER

MOVEMENT	N	TESTS	MEAN	SD	t value	P value
Neck Flexion	20	Pre-test	54.75	6.1718	-11.103	0.000
		Post-test	64.00	6.1984		
Neck extension	20	Pre-test	43.75	5.8207	-9.970	0.000
		Post-test	53.25	5.9105		
Neck right lateral flexion	20	Pre-test	31.25	4.3524	-12.337	0.000
		Post-test	38.00	3.7696		
Neck left lateral flexion	20	Pre-test	31.25	4.2534	-12.337	0.000
		Post-test	38.00	3.7696		
Neck right rotation	20	Pre-test	43.75	6.2565	-6.833	0.000
		Post-test	53.50	6.9015		
Neck left rotation	20	Pre-test	43.75	6.2565	-6.833	0.000
		Post-test	53.50	6.9015		

There is a statistically significant ($p < 0.05$) increased. Table 2 shows that the mean values of ROM of pre-test(54.75) and post-test(64.00) of neck flexion, Neck extension of pre-test(43.75) and post-test(53.25), Neck right lateral flexion of

pre-test(31.25) and post-test(38.00), Neck left lateral flexion of pre-test(31.25) and post-test(38.00), Neck right rotation of pre-test(43.75) and post-test(53.50), Neck left rotation of pre-test(43.75) and post-test(53.50).

GRAPH- II
PRE AND POST- TEST OF RANGE OF MOTION OF NECK JOINT



IV. RESULTS

Table I and Graph I shows that there is significant difference between pre-test and post-test. Reduction in NPRS (numeric pain rating scale) score among subjects treated using Swiss ball for Tension neck syndrome among Goldsmith workers. The mean pre-test mean value of 7.5 is reduced to post-test mean value of 4.5 for the exercise protocol of 4 weeks-3 days per week, which clearly denotes significant reduction in pain and improvement in quality of life. Table II and Graph II shows that there is significant difference between pre-test and post-test. Increase in Range of Motion (ROM) among subjects treated using Swiss ball for Tension neck syndrome among Goldsmith workers. The mean pre-test mean value of neck flexion is increased from 54.75 to post-test value of 64. . The mean pre-test mean value of neck extension is increased from 43.75 to post-test value of 53.25. The mean pre-test mean value of neck right lateral flexion is increased from 31.25 to post-test value of 38. The mean pre-test value of neck left lateral flexion is increased from 31.25 to post-test value of 38. The mean pre-test mean value of neck right rotation is increased from 43.75 to post-test value of 53.50. The mean pre-test mean value of neck left rotation is increased from 43.75 to post-test value of 53.50. The exercise protocol of 4 weeks-3 days per week using Swiss ball for Tension Neck Syndrome among Goldsmith workers, was effective in increasing the Range Of Motion which clearly denotes significant reduction in pain and improvement in quality of life

V. DISCUSSION

Tension neck syndrome is a muscular component which reduces the movement of the neck and reduces in range of motion. It affects most commonly in workers who is focused on same side for prolonged period of time affects deep flexor muscles such a Longus Capitis and Longus Colli. This Tension neck syndrome cause neck, shoulder and upper limb pain, with the sign of tender and stiff muscles and hard areas in the muscles get tightened and spasm. Generally, there is an experience of minimum 3 years, the goldsmith workers have pain with postural changes, it leads to forward neck posture. So this the one of the most common problem for goldsmith workers, which occur due to prolonged forward lean sitting with repeated movements in the neck, it causes Tension neck syndrome. In this study we have found that the goldsmith workers for 20 members having neck pain of age 30 to 45 have severe neck pain with tightness in neck with limited range of motion due to static posture for longer duration. The workers have forward neck kyphosis, so the result of numeric pain rating scale shows that there is pain in the neck ranges from moderate to severe. The workers in their workstation have adopted forward neck posture with limited range of motion having minimal movements. These study should be selected the goldsmith workers by using neck disability index questionnaire with the workers having pain so that the 20 number of goldsmith workers have been taken. This questionnaire should be used to find the number of workers

who have tension neck syndrome for goldsmith workers having age group of 30yrs to 45yrs. The compensatory neck posture develops due to the tension at neck muscles. Articles of Jeoung-AH AHN have showed that Swiss ball stabilization of neck muscles reduces pain and improve the range of motion. Also he concluded that the Swiss ball exercise is more effective than the mat exercise. The stress of neck and scapula muscles could also influences the pain among the goldsmith workers. This work related postural changes may impact other structures around neck The tension neck syndrome can further result in forward head posture and development of inverse thoracic kyphosis.

The strengthening exercise for Goldsmith workers for neck muscles produced a good posture which reduces pain. Muscle benefited by Swiss ball strengthening exercise on deep flexor muscles such as Longus Capitis and Longus Colli. Louise J geneen concluded that the physical activity is acceptable and unlikely to cause harm in people with chronic pain, but many of them feared before that it would increases the pain further. Hye-Young Cho conclude that the Swiss ball stabilization exercise is likely widen the CSA of deep and superficial muscles in patient with chronic neck pain, and can be an efficacious therapeutic method that can decreases the visual analog scale and neck disability index. The participant find difficulty in holding the Swiss ball while performing the exercises.

VI. CONCLUSION

This study concludes that the Swiss ball training exercises is effective for reducing tightness and pain in the neck. This study shows a better relief and increases the comfort and functional activity after the Swiss ball training exercise among goldsmith workers. So there is significant effect of Swiss ball training exercises for Tension neck syndrome among Goldsmith workers.

VII. LIMITATIONS AND RECOMMENDATIONS

The limitations of this study were small sample size and exclusion of home exercises. Recommendations for further studies with different age group, larger sample size and other outcome measures could be done.

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