Effect of Global Posture Re-Education Versus Static Stretching on Pain, Range of Motion And Quality of Life in Post-Menopausal Women with Chronic Neck Pain

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ABSTRACT

***Objective*:** To compare the effects of global posture re-education and static stretching on pain, range of motion and disability in post-menopausal women with chronic neck pain.

Study Design: A quasi-experimental study.

***Place and Duration of Study*:** Sheikh Zayed hospital Rahim Yar Khan, from Jun to Dec 2020.

***Methodology*:** A total of 36 female patients between 45-65 years of age were included in the study. Patients who had received physiotherapy or manual therapy treatment for neck pain in the previous six months or had any tumour infection were excluded. There were two groups, the global posture re-education group (n=18) performed muscle chain stretching, while the static stretching group (n=18) performed conventional static muscle stretching. Visual analogue scale, neck disability index and goniometer were used for outcome measurement.

***Results*:** The results showed significant improvement in visual analogue scale score, neck disability index, flexion and extension range at four weeks and three months follow up (p<0.05). There was no significant improvement in NDI score at three months follow up (p-value >0.05).

Conclusion: There was a significant difference in pain, function and disability in both groups, but the global posture re-education group showed a maximum decrease in pain and disability and gain in ROM as compared to the static stretching group.

Keywords: Articular, Neck muscles, Neck pain, Range of motion.

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INTRODUCTION

Neck pain is a significant health problem experienced by many people during their life.[1] After low back pain, neck pain is the second most commonly reported musculoskeletal disorder.[2,3] The lifetime prevalence of neck pain is reported to be high, varying from 14.20% to 71% in adults.[4] Prevalence is generally higher in females (25-27.20%) than in males (16-17.40%) and increases with age.[5]

Physiotherapists often use a multimodal treatment approach (exercise, manual therapy, electro-therapy, thermal agents, etc.) to manage the neck pain.[6,7]

Park *et al*, determined the effectiveness of different manual treatments for several musculoskeletal and medical conditions and concluded that cervical manipulation is effective for neck pain and acute whiplash-associated disorders (WADs) combined with exercises. They reported inconclusive evidence for cervical mobilisation/manipulation alone for neck pain of any duration.[8]

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Lomas-Vega *et al,* performed a systematic review to determine manual therapy effectiveness for treating non-specific neck pain and found that it improves pain and function in non-specific neck pain patients.[9] However, the evidence was limited for manual therapies in managing patients with neck pain. They also concluded that manual therapy combined with exercises produced better results than manual therapy alone.[10]

This study will help in identifying specific types of combined therapeutic approaches that are most effective in reducing pain and disability and increasing neck ROM in patients with neck pain. The results could assist in developing future management strategies in patients having chronic neck pain, which may help healthcare professionals reduce the individual and societal burden of neck pain and its associated disorders.

METHODOLOGY

This quasi-experimental study was conducted at Physiotherapy Department of Sheikh Zayad Hospital, Rahim Yar Khan, from June to December 2020. The sample size was calculated by using G* power version 3.1 with the input values; effect size-d=1.6871339, α error=0.05, power (1-β err prob)=0.80, allocation ratio

n2/n1=1, output: non centrality parameter δ= 3.1563385, critical t=2.1788128 and Df=12.[11,12]

The ethical approval was taken from Sheikh Zayed hospital Rahim Yar Khan (reference number REC/RCRS/20/1002).

Inclusion Criteria: Post-menopausal female patients, suffering from mechanical neck pain with no specific pathology were included in the study. Patients having neck pain for more than three months and patients who had a secondary complaint of headache were also included in the study.

Exclusion Criteria: Patients who had received physio-therapy or manual therapy treatment for neck pain in the previous six months were excluded from the study.

Three outcome measures were used: visual analogue scale (VAS) for pain, neck disability index (NDI) for disability and a goniometer for neck range of motion.[13] Patients were randomly distributed in two groups using the flip a coin method. Group-1 patients got global postural re-education and group-2 got static stretching. All the patients were given 12 treatment sessions for 4-weeks, which consisted of three treatments in a week.[14] A follow-up assessment was done at six weeks and then at three-month intervals.

Statistical Package for Social Sciences (SPSS) version 21 was used for the data analysis. The paired sample t-test and independent t-test were applied for the group comparisons. The *p*-value of ≤0.05 was considered statistically significant.

RESULTS

In the present study, the impact of global posture re-education and static stretching treatment among post-menopausal women with chronic neck pain was evaluated. Patients were divided into two groups: the global posture group (n=18) and the static stretching group (n=18). The mean age of the group under treatment of GPR and static stretching were 51.82 ± 10.94 years and 49.00 ± 12.80 years respectively. Mean weight of GPR-group was 76.03 ± 12.70kg and in SS-group was 80.35 ± 16.31kg. Mean height of GPR-group was 164.09 ± 7.03cm and in SS-group was 165.06 ± 9.16cm as shown in Table-I.

The comparative analysis showed significant improvement in VAS score and neck disability index (*p*-value <0.05) at four weeks and three months follow up. There was no significant improvement in NDI score at three months follow up (*p*-value >0.05) as shown in the Table-II. Mean flexion and extension ROM for the two groups were found significant (*p*-value <0.05). GPR group exhibited greater improvement in flexion ROM with the mean difference of 9.92 & 8.84 degrees (*p*<0.001). There was no significant improvement in flexion ROM in the two groups after the interventions time to 3 months follow-up, as shown in the Table-III.

Table-I: Demographic profile of the study groups.

Variables	Global Posture Reeducation Group (n=18) Mean ± SD	Static Stretching Group (n=18) Mean ± SD
Age (years)	51.82 ± 10.94	49.00 ± 12.80
Weight (kg)	76.03 ± 12.70	80.35 ± 16.31
Height (cm)	164.09 ± 7.03	165.06 ± 9.16
BMI (kg/cm²)	26.71 ± 4.17	27.96 ± 5.11

Table-II: Group difference for visual analog scale (VAS) & Neck disability index at 4 weeks and 3 months follow up.

Variables	Follow-up	Global Posture Reeducation Group Mean ± SD	Static Stretching Mean ± SD	*p*-value
Visual Analog Scale	Baseline	5.97 ± 1.78	5.56 ± 1.94	0.366
	4 Weeks	3.97 ± 1.78	2.40 ± 1.53	<0.001
	3 Months	2.97 ± 1.80	2.09 ± 1.72	0.67
Neck disability index	Baseline	35.57 ± 17.40	31.16 ± 17.59	<0.001
	4 Weeks follow-up	12.06 ± 8.54	19.39 ± 15.09	<0.001
	3 Months follow-up	6.11± 4.45	18.31 ± 14.44	<0.001

Table-III: Group difference for flexion & extension ROM at 4 weeks and 3 months follow up.

Range of Motion		Global Posture Reeducation Group Mean ± SD	Static Stretching Group Mean ± SD	*p*-value
Flexion	Baseline	43.33 ± 10.75	44.67 ± 13.15	0.008
	4 Weeks follow-up	53.25 ± 10.71	49.52 ± 12.22	0.026
	3 Months follow-up	54.31 ± 9.20	49.88 ± 9.95	0.76
Extension	Baseline	42.06 ± 11.34	44.67 ± 13.07	0.711
	4 Weeks follow-up	47.84 ± 10.72	46.34 ± 12.14	0.026
	3 Months follow-up	49 ± 9.18	47.50 ± 10.39	0.037

DISCUSSION

This study was conducted to determine the effects of global posture re-education and static stretching on pain, range of motion and disability in post-menopausal women with chronic neck pain. Results of the current study showed a significant difference in pain, function and disability in both the groups However global posture re-education group showed the maximum decrease in pain and disability and gain in ROM compared to the static stretching group. It was found in this current research that global posture re-education is

more effective than static stretching in the treatment of neck pain in postmenopausal women. Global posture re-education targets the postural muscles and is thus effective in neck pain.[15]

There was a significant effect on pain, ROM and disability (p-value <0.05) in the global postural re-education group compared to the stretching group. According to previous studies, conventional stretching and muscle chain stretching are very effective treatments.[16-18] Results of the current study were supported by another research that showed that GPR and SE had similar effects on neck and upper extremity function in patients with neck pain. When evaluating groups, GPR was superior to SE in enhancing pain and quality of life.[19] Global Posture reduction static stretching was used in current research to check improvement in range of motion in chronic neck patients. Results of the current study stated that there was a good improvement in neck range of motion in the group of global posture reduction compared to static stretching.

Pillastrini *et al*, concluded that in patients with mechanical neck pain, both MET and stretching effectively alleviate pain and reduce disability. However, MET has shown a better effect on improving pain and functional status of patients with mechanical neck pain than stretching. MET can also be preferred along with traditional exercises over-stretching when treating patients with mechanical neck pain.[17] In the current study, NDI was used to check the disability of chronic neck pain in postmenopausal women. Our results exhibited that participants having global posture reduction as the treatment method showed better improvement in disability.

Previous studies showed results in favour of current research. They concluded that global posture re-education is extremely effective in reducing pain and enhancing the quality of life of women with chronic neck pain.[20,21]

A study by Sneha Somarajan et al, showed statistically significant reductions in VAS and NDI in both groups after a 4-week intervention. However, this outcome measure has identified no significant differences between the groups. In combination with traditional therapy, global postural re-education and static stretching were equally effective in reducing pain and disability in women with chronic neck pain.[22] Our study also stated that static stretching exercises and global posture reduction exercises have helped improve range of motion in patients with chronic neck pain.

There is a significant difference in pain, function and disability in both groups, but the global posture re-education group showed a maximum decrease in pain and disability and gain in ROM as compared to the static stretching group. Therefore, it can be concluded that global posture re-education is more effective than static stretching in treating neck pain in postmenopausal women.

LIMITATIONS OF STUDY

There was lack of placebo group in our study. Multiple neurophysiological effects related to mobilisation are also associated with non-specific effects like a placebo.

CONCLUSION

There was a significant difference in pain, function and disability in both groups, but the global posture re-education group showed a maximum decrease in pain and disability and gain in ROM as compared to the static stretching group.

Conflict of Interest: None.

Authors' Contribution

HA: Conception and design, drafting of article, final approval, NA: Acquisition and analysis of data, critical analysis, ST: Conception and design, analysis drafting of article final approval, KK: Critically revising and final approval.

REFERENCES

1. Falla D, Bilenkij G, Jull G. Patients with chronic neck pain demonstrate altered patterns of muscle activation during performance of a functional upper limb task. Spine 2004; 29(13): 1436-1440.
2. Riaz F, Haider R, Qamar MM, Basharat A, Manzoor A, Rasul A, et al. Effects of static stretching in comparison with Kaltenborn mobilization technique in nonspecific neck pain. Blde Univ J Health Sci 2018; 3(2): 85-88.
3. Ferreira GE, Barreto RG, Robinson CC, Plentz RD, Silva MF. Global postural reeducation for patients with musculoskeletal conditions: a systematic review of randomized controlled trials. Braz J Phys Ther 2016; 20(3): 194-205.
4. Aparicio LF, i Bernat MB. Add-on effect of postural instructions to abdominopelvic exercise on urinary symptoms in climacteric women with stress urinary incontinence: a pilot randomized controlled trial. Int J Environ Res Public Health 2021; 18(3): 928.
5. Kołodyńska G, Zalewski M, Rożek-Piechura K. Urinary incontinence in postmenopausal women - causes, symptoms, treatment. Prz Menopauzalny 2019; 18(1): 46-50.
6. Cassidy. Findings from the bone and joint decade 2000 to 2010 task force on neck pain and its associated disorders. J Occup 2010; 1(1): 424-427.
7. Peolsson A, Marstein E, McNamara T, Nolan D, Sjaaberg E. Does posture of the cervical spine influence dorsal neck muscle activity when lifting? Man Ther 2014; 19(1): 32-36.
8. Park DJ, Park S-YJ. Long-term effects of diagonal active stretching versus static stretching for cervical neuromuscular dysfunction, disability and pain: An 8 weeks follow-up study. J Back Musculoskelet Rehab 2019; 32(3): 403-410.
9. Lomas-Vega R, Garrido-Jaut MV, Rus A, del-Pino-Casado RJ. Effectiveness of global postural re-education for treatment of spinal disorders: A meta-analysis. Am J Phys Med Rehab 2017; 96(2): 124-130.

10. Cunha ACV, Burke TN, França FJR, Marques APJ. Effect of global posture reeducation and of static stretching on pain, range of motion, and quality of life in women with chronic neck pain: a randomized clinical trial. Clinics 2008; 63(6): 763-770.
11. Park SY, Yoo WG. Effect of sustained typing work on changes in scapular position, pressure pain sensitivity and upper trapezius activity. J Occupat Health 2013; 55(3): 167-172.
12. Pillastrini P, Mugnai R, Farneti C, Bertozzi L, Bonfiglioli R, Curti S, et al. Evaluation of two preventive interventions for reducing musculoskeletal complaints in operators of video display terminals. Phys Ther 2007; 87(5): 536-544.
13. de-Souza N, Ramos Barcellos R, Martins AC, Vianna da Rosa G, Araújo-Leite M, da Silva C, et al. morphotypological prevalence of individuals assessed by the method of global postural reeducation by proprioceptive and muscular rebalancing (GPR/PMR). J Funct Morphol Kinesiol 2018; 3(2): 33-35.
14. Bertozzi L, Gardenghi I, Turoni F, Villafañe JH, Capra F, Guccione AA, et al. Effect of therapeutic exercise on pain and disability in the management of chronic nonspecific neck pain: systematic review and meta-analysis of randomized trials. Phys Ther 2013; 93(8): 1026-1036.
15. Amorim CS, Gracitelli ME, Marques AP, Alves VL. Effectiveness of global postural reeducation compared to segmental exercises on function, pain, and quality of life of patients with scapular dyskinesis associated with neck pain: a preliminary clinical trial. J Manipulative Physiol Ther 2014; 37(6): 441-447.
16. Dupuis S, Fortin C, Caouette C, Leclair I, Aubin C. Global postural re-education in pediatric idiopathic scoliosis: a biomechanical modeling and analysis of curve reduction during active and assisted self-correction. BMC Musculoskelet Disord 2018; 19(1): 1-9.
17. Pillastrini P, de Lima E, Sá Resende F, Banchelli F, Burioli A, Di Ciaccio E, et al. Effectiveness of Global Postural Re-education in Patients With Chronic Nonspecific Neck Pain: Randomized Controlled Trial. Phys Ther 2016; 96(9): 1408-1416.
18. Fuentes-Aparicio L, Balasch-Bernat M, López-Bueno LJ, Health P. Add-on effect of postural instructions to abdominopelvic exercise on urinary symptoms and quality of life in climacteric women with stress urinary incontinence. a pilot randomized controlled trial. Int J Environ Res Public Health 2021; 18(3): 928.
19. Bertozzi L, Villafañe JH, Capra F, Reci M. Effect of an exercise programme for the prevention of back and neck pain in poultry slaughterhouse workers. Occup Ther Int 2015; 22(1): 36-42.
20. Radhakrishnan R. Effective-ness of global posture re-education on pain and improving quality of life in women with chronic neck pain. Int J Phys Educ Sports Health 2015; 1(4): 7-9.
21. Yamato Y, Hasegawa N, Sato K, Hamaoka T, Ogoh S. Acute effect of static stretching exercise on arterial stiffness in healthy young adults. Am J Phys Med Rehabil 2016; 95(10): 764-770.
22. Somarajan S, Hingarajia DJ. Development. Effect of global postural re-education and static stretching on pain and disability in women with chronic non-specific neck pain-a comparative study. Indian J Public Health 2021; 12(1): 447–453.

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