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ORIGINAL ARTICLE

Comparative Effects of Stabilizing Exercises and PNF Stretching of Upper Trapezius on Functional Disability & Pain in Cell Phone Consumers Having Neck Pain

IQRA ASHRAF[1], SIDRA MANZOOR[2], ABDULLAH KHALID KHAN[3], YASHA SAJJAD[4], NAVERA FATIMA[5], ROMAISA JAVED[6]
[1]*Doctor of Physiotherapy, Amna Innayat Medical College*
[2]*School of Allied Health Sciences, CMH, LMC & IOD*
[3]*DPT Department, University of Lahore*
[4]*School of Allied Health Sciences, CMH, LMC & IOD*
[5]*Amna Innayat Medical and Educational Complex ,*
[6]*Core stability Clinic, Hous3 13/b, Sajid Awan Colony Bahawalpur*
Correspondence to Dr. Sidra Manzoor, Email: sidramanzoor76@gmail.com, Cell: 0304-072089

ABSTRACT

Aim: To compare the results of proprioceptive neuromuscular facilitation stretches with stability exercises of upper trapezius in reference to neck ranges, disability level and pain specifically in mobile phone users with neck pain.
Methods: Convenient sampling was used with randomization at the time of group allocation and blinding of assessor was made sure. 50 subjects both males and females with neck pain were recruited with 18 to 30 years of age. 2 treatment groups were present each containing equal number of subjects. One group was treated using stretches and other was given stability exercises. Neck disability index was used to record level of disability for neck and Numeric pain rating scale was used for recording pain levels at baseline, 4th and 8th weeks after treatment. Study was completed in 9 months.
Results: Both groups showed no important difference with $p > 0.05$. However, both groups indicated significant changes in pain intensity and neck functionality at 4th and 8th weeks when compared with baseline.
Conclusion: Both techniques were equally effective in improving neck ranges, pain levels and neck functionality.
Keywords: Mobile Phone, Neck Pain, Proprioceptive Neuromuscular Technique, Stretches, Stabilization.

INTRODUCTION

21st century has major demand for smart phones. Total contribution of smart mobiles in mobile phone industry was estimated to be 13.8% in 2009 that has increased drastically up-to 24.9% by 2014[1]. Daily users of mobiles complain frequently of neck pain, headaches, tremors and finger aches[2]. In addition to that, most of the mobile users struggle with neck pain at some point in their lifespan. This pain leads to decreased functioning of daily living and hence decreasing the overall quality of work and life. Economic problems are cherry on top of all problems[3]. Poor and deviated postures due to excessive mobile usage lead to multitude of problems in the body especially in neck musculatures[(4)]. Neck stretches and stability exercises (NSEs) are most commonly used approach in rehabilitation centers in dealing with neck related problems[5].

A survey from USA showed that 75% of teenagers have their own phones and 88% are daily mobile text messages users[6]. Excess mobile use causes unavoidable slouched and forward head posture and also puts muscles and bones at increased stress that causes loss of normal curvatures in spine. This results in decreased functionality and increased pain intensities[7]. Pain in neck is the 2nd common muscular disorder as 1st is low back pain. 2/3rd people reports neck discomfort at some point in life[8]. There are studies present targeting stretches and stability exercises for cervical region considering longer follow ups but none highlighted the short term effects of these exercises in reducing pain, dysfunction and improving ranges of cervical part in mobile phone users[9].

In order to replenish muscle strength, ranges, to heal injured structures and to improve stamina and assure better quality of life, exercising is the most commonly used approach especially in populations presenting with neck aches[10]. Neck stability exercise regimes target normal posture of cervical spine along with improving strength gains in deep cervical flexors (DCF) comprising of longus colli and capitus[11]. Studies from recent years showed that neck stability exercises target deep stabilizer neck musculature in order to uplift coordination control among superficial and deep neck muscles[18]. Stretches stimulates proprioceptors present in musculo-tendinous units hence, avoiding atrophy, removing element of fatigue and increasing the overall flexibility of muscle mass[12].

Few to none studies showed comparison of stability exercise regimes and PNF stretches regimes. Deviated and confusing outcomes are present from previous studies only targeting longer duration of exercises.

However, this study compared and contrasted the results of both techniques on pain, dysfunction and ranges of cervical region in mobile phone users. This study also considered short duration outcomes too.

METHODS

It was randomized clinical trial study with convenient sampling technique and with blinding of assessor. Study was conducted in Social Security Hospital Physiotherapy Department. Study duration was 9 months after the approval of conducting study from Ethical Review Board Committee of University of Lahore. In two groups 50 patients were randomly divided, 25 in each group. Sample size was collected by comparing means from previous study[(13)]. Inclusion criteria included both male and female patients in age range between 18 to 30 years with non-specific neck pain from past 4 weeks. Permanent mobile phone users were those who have spent more than 8 hours a day on their phones. People with spinal stenosis, disc herniation, spasmodic torticollis, migraine histories, ongoing therapies and pregnancies were excluded. Informed consent was taken from each participant before applying any technique. Group A was given PNF stretching techniques using neck flexion pattern and neck extension pattern[(14)]. Neck stabilization exercises were given to group B to perform actively chin tuck in, scapular retraction, shoulder shrugs, shoulder rolls and cervical extension[15]. Both techniques were given for 10 repetitions with 2 sets a day under supervision of a physiotherapist. Outcome measures were Numerical pain rating scale (NPRS) for pain, and neck disability scale (NDI) for measuring disability. Data was collected at baseline, at end of 4th and 8th weeks. Data was analyzed using SPSS version 24. Shapiro Wilk determined that data was not normally distributed. Friedman Anova Test was used to measure changes across 8 weeks and Manny Whitney test was used to compare both groups over 8 weeks.

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RESULTS

Females were 20(80%) and males were 5(20%) in both groups. Table 1 summarizes the age, history of neck pain and baseline NDI, baseline NPRS across the groups. In group A (Stretching Exercises) maximum age of the participants was 30.00 and minimum age was 19.00 with mean age of 25.20 and standard deviation of 3.48. In group B (Stabilization Exercises) maximum age of the participants was 36.00 and minimum age was 18.00 with mean age of 24.40 and standard deviation of 4.39.

Table 1: Clinical & Descriptive statistics of both groups

Variables	Mean	Std. deviation	Max.	Min.
Stretching (n=25)				
Age (years)	25.2000	3.47611	30.00	19.00
Neck pain History (months)	6.3200	3.43657	12.00	1.00
Baseline NDI	37.36000	25.571599	80.000	4.000
Baseline NPRS	5.28000	2.13	8.00	2.00
Stabilization (n=25)				
Age (years)	24.40	4.39697	36.00	1.00
Neck pain history (months)	4.00	2.91548	9.00	4.000
Baseline NDI	24.64	16.869302	64.000	2.000
Baseline NPRS	4.52	1.917464	8.000	2.000

Table 2 shows that stretching and neck stabilization exercise groups showed no significant differences in improving neck pain and neck disability all with p>0.05 when both groups compared with each other.

Table 2: Comparison of stretching & neck stabilization groups using Mann Whitney U test

Variables	p-value
NPRS baseline	0.19
NPRS 4th week	0.96
NPRS 8th week	0.48
NDI baseline	0.06
NDI 4th week	0.30
NDI 8th week	0.64

Table 3 shows with in group changes in neck disability and neck pain in both groups after applying interventional techniques over 8 weeks. Both interventions showed significant improvements in pain and disability all with p<0.05.

Table 3: Within group comparison using Friedman Anova in stabilization group & stretching (PNF) group

Variables	p-value
Baseline NDI *(Stabilization)*	0.00
NDI 4th week	
NDI 8th week	
Baseline NPRS *(Stabilization)*	0.00
NPRS 4th week	
NPRS 8th week	
Baseline NDI *(Stretching)*	0.00
NDI 4th week	
NDI 8th week	
Baseline NPRS *(Stretching)*	0.00
NPRS 4th week	
NPRS 8th week	

DISCUSSION

In this study, Neck stabilization exercises had positive and immediate effects on upper trapezius muscle in mobile phone users and confirmed a decline in pain, functional disability of the upper trapezius after the implementation of neck stabilization exercises. Exercise intervention will be beneficial in reducing pain and related musculoskeletal injuries due to static postures in mobile phone users. Strengthening or Stabilization exercises are quite essential for the welfare of individuals who had upper trapezius pain due to overuse of mobile phones.

According to a study which was conducted in 2018, in mobile phone users, a comparison was shown between stabilization and stretching exercises on upper trapezius muscle weakness. The result of the study showed the muscle weakness on the upper trapezius muscle reduced following application of stabilization exercises and stretching in mobile phone users. There were statistically major differences found between stabilization and stretching exercises with a p-value is equal to p<0.05 which was contrary to current study as no major differences were found in present study[9]. Another literature from 2020 about with or without upper thoracic mobilization on non-specific neck pain showed the effectiveness of stretching exercise and cervical mobilization. This study showed significant decrease in neck disability level and pain in both groups and was in agreement with current study[8]. All of these studies proved that neuromuscular proprioceptive exercises and neck stretching are effective maneuvers in reducing neck discomfort and disability. It is recommended to future researchers to alter frequency, duration and intensity of exercises and then compare and contrast both techniques across more age groups and other populations as well. This study was conducted during the period of covid19 pandemic so not many settings were allowing to collect data due restrictions so this study's data was confined to just one setting, moreover, older population cannot be recruited as they were avoiding hospitals at that alarming time of pandemic and lastly there were financial constraints during this study so researchers were bound to take data from one nearby hospital.

CONCLUSION

This study determined that both techniques stabilization exercises and proprioceptive neuromuscular facilitation stretching of superior trapezius are equally effective in improving functional disability, decreasing the discomfort and improving range of motion.

Conflict of interest: Nil

REFERENCE

1. Kim GY, Ahn CS, Jeon HW, Lee CR. Effects of the use of smartphones on pain and muscle fatigue in the upper extremity. Journal of physical therapy science. 2012;24(12):1255-8.
2. Lee M, Hong Y, Lee S, Won J, Yang J, Park S, et al. The effects of smartphone use on upper extremity muscle activity and pain threshold. Journal of physical therapy science. 2015;27(6):1743-5.
3. Yildiz TI, Turgut E, Duzgun I. Neck and scapula-focused exercise training on patients with nonspecific neck pain: A randomized controlled trial. Journal of sport rehabilitation. 2018;27(5):403-12.
4. Lee S, Choi Y-H, Kim J. Effects of the cervical flexion angle during smartphone use on muscle fatigue and pain in the cervical erector spinae and upper trapezius in normal adults in their 20s. Journal of Physical Therapy Science. 2017;29(5):921-3.
5. Lee J-D, Shin W-S. Immediate effects of neuromuscular control exercise on neck pain, range of motion, and proprioception in persons with neck pain. Physical Therapy Rehabilitation Science. 2020;9(1):1-9.
6. Gustafsson E. Ergonomic recommendations when texting on mobile phones. Work. 2012;41(Supplement 1):5705-6.
7. Thenmozhi M, Kohilavani S. A Comparative Study between Stretching with Postural Modification versus Stretching Alone in Smartphone Users with Neck Disability.
8. Safdar M, Sarfraz N, Ishaq I, Sabir M, Mahmooda S, Bashir A. Effectiveness of cervical mobilization and stretching exercise with or without upper thoracic mobilization on non-specific neck pain. Rawal Medical Journal. 2020;45(1):80-3.
9. Jothi S, Prasanna ML, Sivakumar V. Comparison between Stretching and Stabilization Exercises on upper Trapezius Muscle Fatigue in Mobile Phone users. Executive Editor. 2018;9(9):126.
10. Dusunceli Y, Öztürk C, Atamaz F, Hepguler A, Durmaz B. Efficacy of neck stabilization exercises for neck pain: a randomized controlled study. Journal of rehabilitation medicine. 2009;41(8).
11. Subramani Parasuraman ATS, Yee SWK, Chuon BLC, Ren LY. Smartphone usage and increased risk of mobile phone addiction: A concurrent study. International journal of pharmaceutical investigation. 2017;7(3):125.
12. Kim H-Y, Yeun Y-R, Kim S-J. Preventive effects of stretching and stabilization exercises on muscle fatigue in mobile phone users. Journal of physical therapy science. 2016;28(9):2529-32.
13. Parisa GH, Mohammad H, Asghar A, Leila R, Fateme G. Investigating the effect of stabilization exercise and proprioceptive neuromuscular facilitation exercises on cross-sectional area of deep cervical flexor muscles in patients with chronic non-specific neck pain. International Journal of Medical Research & Health Sciences. 2016;5(11):502-8.
14. Pattanshetty R, Mathias OD, Chopde C. Effect of proprioceptive neuromuscular facilitation neck pattern exercise on cervical range of motion and quality of life in post-operative head and neck cancer patients: an interventional study. Int J Physiother Res. 2018;6(5):2857-63.
15. Kaka B, Ogwumike OO. Effect of neck stabilization and dynamic exercises on pain, disability and fear avoidance beliefs in patients with non-specific neck pain. Physiotherapy. 2015;101:e704.