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Editorial

Exer-Gaming: A Novel Tool in Stroke Rehabilitation

Arshad Nawaz Malik *

Stroke also known as cerebrovascular accident (CVA) is the condition of neurological deficits resulting from lack of blood supply to brain. It is the 3rd most common cause of death and 1st leading cause of disability in developed as well as developing countries. The incidence rate of stroke in Pakistan is 250 per 100, 000 and it is more prevalent in younger population as compare to western countries. The economic and social costs of disability are considerable, but difficult to quantify the exact cost. Comprehensive costs of the disability are scarce and fragmented even in developed countries. The cost of productivity loses because of direct and indirect consequence of disability and causing a huge burden on society[1].

The neuro rehabilitation is complex, dynamic and goal oriented process to achieve the optimal outcome in stroke patients. Multiple rehabilitation approaches based on different theoretical frameworks are widely used to promote the function and activity level in stroke. The main objectives of all approaches are to enhance the level of independence, participation and quality of life of stroke patients. The focus of rehabilitation is to restore the function and facilitate the brain plasticity which activates the smooth synaptic transmission. The brain recognizes the appropriate repetition with sensory input to achieve the skill acquisition. The effective rehabilitation needs higher repetition with active involvement of patients. But during the implementation process of neuro rehabilitation, there are certain limitations and barriers which directly affect the recovery process. The major issues include the limited repetition practice, lack of motivation and engagement of patients in performing tasks and skills.

*Associate Professor, Riphah College of Rehabilitation Sciences, Riphah International University, Islamabad
Arshad Nawaz Malik
(arshad.nawaz@riphah.edu.pk)

Recently, technology has fueled both our quest for knowledge and the mechanisms available to obtain and retrieve it. One manifestation derived from these discoveries has been our ability to engage new ways of exploring our nervous system. Exer-gaming, a term used to describe the form of exercise through games and it relies on the technology that tracks the body movement and gesture. The exer-gaming has recently developed innovative idea for promoting the function with motivation[2]. The utilization of exer-gaming in stroke rehabilitation has significant and effective role in providing the higher repetition along with active involvement of patients. It not only improves the functional level but also enhances the motivation and interest of patients. The task oriented and context specific exer-gaming engage the patients with proper utilization of cognition which lead to enhance the brain plasticity. Interactive technology that can improve the physical activity level, improves cognitive skills, concentration and simply to enjoy the challenge of game itself. The

stress and depression is also associated with stroke but exer-gaming reduces the symptoms and improve quality of life. The literature shows that exer-gaming has remarkable effects on upper limb function, activities of daily life and postural control. This technology can effectively provide a platform to perform maximum repetition of activity and is a better option as compare to conventional approaches.[3]

In Pakistan the stroke incidence is gradually increasing in the younger population and it is major threat to the working and earning community. This will eventually raise the burden on society, so it should be on priority to rehabilitate the persons with stroke disability and make them an independent & active member of society. Exer-gaming is a novel tool in neuro rehabilitation to provide an interactive activity and commercial video games are available which are cheap and easy to implement. It is prime responsibility of professionals to provide a comprehensive rehabilitation approach to achieve the highest functional level and enable individuals to live independent life.[4] This technology reduces the exhaustive assistance from of therapist and is also easy to manage in home based rehabilitation in future. It is time to utilize the technological assistance in neuro rehabilitation to achieve the optimal outcome in short duration.

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Journal of Riphah College of Rehabilitation Sciences

ORIGINAL ARTICLE

Effectiveness of Thoracic Spine Manipulation on Subjects with Subacromial Impingement Syndrome

Danish Hassan[1], Umair Ahmed[2], Rashid Hafeez Nasir[1]

1. Riphah International University, Islamabad
2. University of Lahore, Lahore Campus

Corresponding Author:
Danish Hassan
(danish.hassan009@gmail.com)

ABSTRACT

Background: Subacromial impingement syndrome is one of the most debilitating conditions affecting the shoulder joint and principal cause of shoulder pain. Though the role of manual physical therapy of thoracic spine along with the other treatment options at shoulder joint is well established, the specific effects of manual physical therapy techniques are not adequately reported.

Objective: This study was primarily designed to investigate the effectiveness of high velocity low amplitude thrust manipulation of thoracic spine on the subjects with the subacromial impingement syndrome.

Methodology: This study was quasi experimental trail in which 30 patients were recruited using a convenience sampling technique, for a single treatment session of high velocity low amplitude thrust manipulation at thoracic spine. Immediate effects of this intervention were recorded on 100mm Visual Analogue Scale and improvement in ROM at shoulder joint as primary outcome measure. A 14 points patient reported Global Rating of Change scale was also used as secondary outcome measure.

Results: There was mean reduction of pain by 27.03 ± 12.92 (p-value < 0.05) which was statistically and clinically significant. There was also improvement in shoulder range of motion by 25°- 35° and mean post treatment global rating of change score of 4.03 with median score of 5.

Conclusion: Thoracic spine manipulative technique is effective in terms of reducing subjective pain and improving range of motion at shoulder joint in subjects with subacromial impingement syndrome. This also signifies the potential interdependence between anatomical regions of thoracic spine and shoulder girdle.

Key Words: Shoulder Pain, Manipulation, Manual Therapy, Subacromial Impingement Syndrome.

INTRODUCTION

Shoulder pain is the 3rd most common diagnosis affecting the general population after low back pain & neck pain. One of the principal diagnosis of shoulder pain is subacromial impingement syndrome that is compression of subacromial structures between head of humerus and acromion [1], Subjects often report pain while performing any overhead activities[2,3]. Impingement syndrome is normally classified into 02 types; Primary & Secondary impingement sundrome process[4]. Primary impingement syndrome is further classified into 02 types based upon its etiological factors. It my intrinsic in nature due to surrounding muscle weakness or inflammation of the tendons of extrinsic due to abnormal anatomical features of the acromion [7,8]. Secondary impingement may be due to altered glenehumral or scapulothoracic biomechanics as result of shoulder instability [9].

In the past couple of decades, multiple researches were conducted to investigate the effectiveness of TSM using different techniques for the treatment of different MSK conditions affecting the upper quadrant [10-12]. Interestingly most of the recent researches evaluating the effects of TSM were not directed at thoracic spine itself, but towards the areas adjoining the thoracic spine like neck and shoulder. This has led to the development of a concept known as regional interdependence [13], which states that seemingly unrelated impairments in a remote anatomical region may contribute to, or be associated with, the patient's primary complaint.

Different studies worked on the concept of using multimodal techniques for treatment of different musculoskeletal disorders of the upper quadrant, and also incorporated cervico-thoracic spine manual therapy along with other conservative treatment approach in management of shoulder

pain. Improved outcomes were reported in the study, with reduced pain when SMT was assimilated to an overall treatment protocols for patients with shoulder impingement syndrome [14]. These results were further testified by in a clinical trial by Bergman et al[11] that assessed the added benefit of applying SMT and rib manipulations and mobilizations to a standardized treatment plan for the patients receiving medical management for their shoulder pain. The results favored the groups that received combination of both manipulative and medical treatment. In a recent research [15], patients diagnosed with bilateral impingement syndrome and rotator cuff disease reported improved outcome when they were managed with different manual therapy techniques including the SMT directed at cervical and thoracic spine and home based rehabilitation exercises. Athletes diagnosed with swimmer's shoulders also showed reduced crepitus, decreased in pain when measured on VAS before and after swimming when managed with SMT of ribs, cervicothoracic junction, and middle thoracic spine, and different physiotherapy techniques for myofascial adhesions and a rehabilitation program [16].

Though the effects of combining different manipulative techniques with conventional physical therapy have been adequately reported in the literature, relative effect of any specific manipulative technique applied at thoracic spine for their effects at shoulder joint is not reported yet. So this study was conducted to determine the effectiveness of thoracic spine manipulation in subjects with subacromial impingement syndrome.

METHODOLOGY

This study was conducted at Outpatient Department of Physical Therapy Jinnah Hospital & Akram Medical Complex Lahore. The study design used in this study was quasi experimental trial. Subjects with primary complaint of unilateral shoulder, age between 18 and 65 years, established diagnosis of sub acromial impingement syndrome, decreased ROM at the glenohumeral joint & pain reproduction with either Hawkins Kennedy or Neer's Impingement test were included in the study. Subjects with bilateral shoulder pain due any underlying systemic disease such as tumor, rheumatoid arthritis or fracture, physical findings consistent with adhesive capsulitis, ghlenohumeral osteoarthritis, cervical radiculopathy , any serious spinal pathology like infection, tumors, spinal fracture or osteoporosis or unwilling to undergo spinal manipulative therapy were excluded.

30 subjects using convenient sampling technique, meeting the afore mentioned inclusion and exclusion criteria were recruited for this study by expecting a mean pain 31.9 ± 2.6 change using 95% power of study and 5% level of significance. Written consent of the subjects was recorded before participating in this study. Socio demographic data was also recorded at the start of the study.

General history taking and standardized physical therapy examination of the shoulder girdle was done to include the shoulder, cervical spine and thoracic spine. Shoulder abduction and flexion was measured with the subject in seated position while the total sum of internal and external rotation was recorded with the subject in spine lying with shoulder abducted to 90 and elbow flexed to 90. The Hawkins Kennedy [17] (Sensitivity 0.92 and specificity 1.00) and Neer's Impingement [17] (sensitivity 0.79 and specificity 0.53) test were performed on each subjects and immediately pain was recorded on 100 mm VAS. Lastly the physical examination of the thoracic spine was performed. This included the assessment of motion restriction, overpressure testing and symptom response for thoracic ROM (flexion, extension and bilateral rotation). Thoracic segmental mobility testing PAIVMs applied to the spinous and transverse processes. Following the physical examination all subjects were treated with high velocity, low amplitude thrust manipulation directed at the thoracic spine. The type of manipulative technique they received was based on the presence or absence of specific thoracic dysfunction.

Subjects with stiffness in the cervicothoracic junction were treated with a seated cervicothoracic junction distraction manipulation. Subjects with a thoracic flexion/opening restriction were treated with a supine technique that facilitated segmental thoracic flexion or rib mobility. Subjects with a thoracic extension/closing restriction were treated

with a prone technique to facilitate segmental thoracic extension. Subjects with no identifiable thoracic or rib restrictions were to receive a nonspecific general seated manipulation performed in a longitudinal direction to produce a distraction or unloading of the thoracic spine.

Usually the manipulative technique is followed by an audible pop from the segment at which it is applied. The treatment was discontinued if there was no popping sound after three attempts at specific vertebral segment at which the manipulative technique was applied. Post treatment pain was recorded immediately on the 100 mm VAS. Another self reported secondary outcome measure: Global rating of change was used. It's a 15 point scale with zero in the center showing no change, (+7) indicating a very great deal better and (-7) indicating a very great deal worst. This scale was used to assess the over change in the shoulder pain, motion and stiffness of the subjects after receiving manipulative treatment at thoracic spine. The pre and post treatment data was analyzed using SPSS 16. Statistical significance was set at *P* = 0.05. Paired sample *t*-test was performed to detect any differences between baseline and post-treatment shoulder ROM measurements and VAS pain scores.

RESULTS

A total of 30 patients participated in this study with 73.33 % (n=22) males and 26.67% (n=8) females. Mean age of the patients that participated in the study was $\chi = 38.33 \pm 10.06$. The age range of the patients was between 21 and 57 years. Most of the subjects i.e. 50% (n=15) that were included in the study had chronic presentation of the symptoms of the shoulder pain. 30% (n=9) presented with acute onset while only 20% (n=6) had sub acute presentation of the shoulder complaints. Results of this study demonstrated that there was mean reduction of pain by 27.03 ± 12.92 which was statistically and clinically significant ($p<0.05$) (Table 1). There was also improvement in shoulder range of motion by 25°- 35° (Figure 1) and mean post treatment global rating of change score of 4.03 with median score of 5.

Table I: Pre Treatment, Post Treatment and Mean change in VAS & Shoulder ROM With p value

	Pre-Treatment	Post- Treatment	Change Score	P-Value
Mean VAS Score (SD)	69.37 (10.11)	42.33 (16.21)	27.03 (12.92)	<0.05
Mean Shoulder Flexion ROM (SD)	106.03° (13.44)	133.93°(13.27)	27.90°(15.41)	<0.05
Mean Shoulder Adb ROM (SD)	94.83° (16.42)	127.13° (13.90)	32.30° (16.01)	<0.05
Mean Shoulder Rot ROM (SD)	127.53° (11.93)	152.03° (9.60)	24.50° (13.27)	<0.05

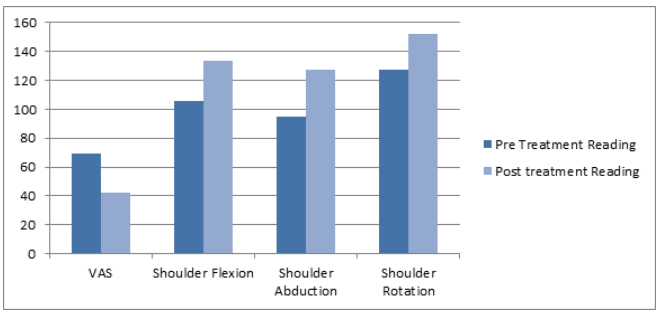

Figure I: Multiple Bar Chart showing comparison of Pre & Post treatment values for Changes in VAS score and Shoulder ROM.

According to the classification of GRC proposed by Juniper at el 3 subjects reported no change in the symptoms (GRC= 0 or 1), 10 had minimal improvement (GRC = 2 or 3), 10 had moderate improvement (GRC= 4 or 5) and 7 had a large improvement in their general condition (GRC= 6 or 7).

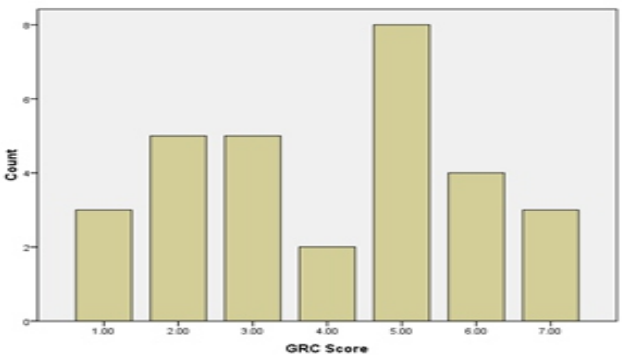

Figure II. Global Rating of Change Score

No subject reported adverse effects of the manipulative treatment directed at the thoracic spine i.e. negative value of the GRC (Figure II).

DISCUSSION

This study was principally designed to determine the effectiveness of 04 different high velocity low amplitude thrust manipulation on patients with sub acromial impingement syndrome. Results showed statistically significant reduction in shoulder pain and improvement in shoulder range of motion. Overall improvement was also evident from the post treatment GRC score, which did not recorded any adverse affect of manipulative technique on the patients.

Different studies have been conducted on the based on the concept of regional examination treatment approach, using different manipulative techniques of spine for management of shoulder pain. A recent study investigated the effect of HVLA thrust manipulation on the subjects diagnosed with shoulder impingement syndrome. Results showed statistically significant reduction in pain recorded on NPRS and SPADI after 48 hours of follow up consistent with the results of this study[12]. A similar study measured pre and post treatment difference in the strength of bicep muscle in 16 subjects with established diagnosis of chronic neck pain. These subjects were treated with thrust joint manipulation at cervico-thoracic junction. There was significant improvement in strength of bicep muscle [19]. Another study was conducted on asymptomatic subjects investigating the strength of lower trapezius muscle. Subjects were divided into 02 groups. The group that received grade IV mobilization of thoracic spine recorded significantly improved muscle strength compared with other group that was treated with grade I mobilization [20]. A similar study also documented the similar results of improved lower trapezius strength immediately after thoracic spine manipulation [21].

A second proposed theory is analgesic effect of joint manipulation leading to reduction in pain and improvement in shoulder mobility. This effect is due to increased level of the plasma levels of endogenous opiates like beta endorphins that binds to receptors in the nervous system and reduces pain. A study conducted recorded increase in the plasma levels of beta endorphins after 5 minutes interval in subjects that received high velocity manipulation at cervical spine. No significant increase in the levels of this endogenous opiate was recorded in the control group that was managed with only less aggressive mobilization technique [22]. This mechanism was further investigated by several other authors. A study investigating the effects of spinal manual therapy on VAS pain score used an opioid antagonist,Naloxone in experimental group[23]. Naloxone usually reverses the effects of endogenous opiates produced in the body. The control group was given only a normal saline solution. Improvement in pain was recorded in both groups contradicting the previous findings of the study and falsifying endogenous opioids mechanism of post manipulation analgesia.

CONCLUSION

It can be concluded that thoracic spine manipulation is effective in reducing self reported pain and improving ROM in subjects with SIS.

LIMITATIONS

There are some very apparent limitations of this study conducted. Effects recorded in this study are the very immediate one. No long term effects were documented and patients were not followed to record any adverse affects later on. There was only a single treatment group and no randomization was done to allocate the patients in different groups, to compare its effects with any other technique. No control group was used in this study and neither was the researcher blinded to remove any biasness. No cause and effect relationship was therefore can be concluded from the findings of this study.

RECOMMENDATIONS

Future researchers are recommended to perform a randomized clinical trial to prove the efficacy of this technique alone and over other manipulative techniques also.

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ORIGINAL ARTICLE

Speech Language Pathologists' Assessment Practices for Children with Suspected Speech Sound Disorders

Nayab Iftikhar[1], Rabia Gulzar[1], Sumera Nawaz Malik[1]

1. Riphah International University, Islamabad
Corresponding Author :
Nayab Iftikhar
(speechpathologist@gmail.com)

ABSTRACT

Background: Speech sound disorders (SSD) are disabling conditions that effect social, emotional and cognitive well-being of children. Proper assessment is crucial for finding out the nature of SSD and thereby developing appropriate strategies for treatment. No work has been done regarding the assessment procedures used by SLP's in current setting.

Objective: Objective of this study was to determine the assessment practices used by speech and language pathologists for children with suspected speech and sound disorders.

Methodology: This was a descriptive cross sectional survey, conducted in clinical set ups of Lahore. The target population was Speech Therapists. Using sample of convenience, total sample size taken was 112 speech therapists. Data were collected through Questionnaire as hands out.

Results: Out of total 112 respondents 24 (21.4%) were independent studying,56(50%) were of graduate and 32(28.6%) were having other qualification not mentioned in questionnaire. Out of total 112 respondent, 40 (35.7%) were using clinical assessment always, 32(28.6%) were using it sometimes, 8(7.1%) were using it in frequently and 32 (28.6%) never used clinical assessment of articulation. And this is the maximum use.

Conclusion: The most frequent tests used for assessment for Speech Disorders are Fisher Logeman Test, Goldman Fristoe and Banks on Test. Majority of Speech therapists also prefer to use prolong Directive Method of assessment through functional activities.

Key Words: Speech Pathologist, Speech Sound Disorders, Assessment, Articulation Disorders

INTRODUCTION

Sound or Speech disorders are the disorders of communication in which the normal sound and speech is impaired. This can result into number of further disorders. If strict screening be followed, only 5 to10 percent of population would come under normal sound and speech disorders [1-3]. If we further narrow down the types of disorders associated with speech, there are number of these such as apraxia of speech, cluttering, developmental and verbal dyspraxia, dysarthria, dysprosody, muteness, speech sound disorder, on which this study is mainly focused, and voice disorders [4-8]. Main proportion of these disorders is manageable by speech therapy. Some may require medical support. Psychotherapy has also good results in correction of organic conditions. If treated more sophistically, patients can be treated in teams including speech and language pathologists, teachers, medical specialists and family members [9-10]. Many speech and language pathologists think that phonological assessment and treatment of children produces confusion in comparison to clinical assistance. This thinking produces a question mark on application of phonological concepts regarding assessment and interventional strategies. One potential benefit of such confusion is due to the big expectation from old techniques. New terms and techniques should be developed and used in place tool dones to mark a clear demarcation. Currently the old techniques are being used with new different names. That creating total confusion [11].

A study conducted in United Kingdom among speech language pathologists to find out practice patterns about assessment and treatment of phonology in children. Most of therapists were found using South Tyneside Assessment of Phonology for assessment of children [12]. A study conducted in this regard to compare two methods systematically, for phonological assessment. Two methods were conversation and picture naming

method. All subjects were male with impaired phonology. All subjects had not received speech language pathology before this Disease's severity level. Statement of guidelines and patient load, these all determine choice of assessment used by clinician. For speech sound disorders assessment, therapists it is the expertise of therapist how to balance in time and methods, how to get relevant data and how to decide what method should be preferred.

The opinions of these clinicians were presented in the 2002 American Journal of Speech- Language Pathology (AJSLP). The authors who contributed to the 2002 AJSLP Forum on Phonology presented a variety of standardized and non-standardized procedures for the assessment of SSD. Three of the authors assessed expressive speech and phonological skills using a published single-word test such as the Goldman Fristoe Test of Articulation [13]. No work has been done regarding the assessment procedures used by SLP's in current setting, as there was no literature found. This study will help create evidence for SLP's and clinicians to evaluate their assessment procedures and compare them to those mentioned in the literature and used by expert clinicians. It is suspected that very little is known in clinical practice patterns regarding assessment of phonological disorders. This study would be beneficial for Speech Language Pathologists and may lead to new directions in relevant research.

METHODOLOGY

It was an observational cross sectional survey. Study was completed in 6 months. Total population size of speech therapist was taken as 400, and using sampling calculator, keeping confidence level 95%, confidence interval 5%, sample size calculated was of 132 or more. Non-Probability Convenience Sampling Technique was used to collect data. Informed consent was obtained from the participants fulfilling the inclusion criteria. Self-administered, 51 item validated instrument was used to collect data from the participants regarding their education, experience, working conditions and assessment practices. Some items on the instrument form ensuring participants' frequency of use of commercially available tests, implementation of assessment procedures, and speech sound analysis procedures, had to be answered on Likert Scale. All collected data was entered in computer program SPSS version 16 and analyzed through this software. Mean and median were calculated for quantitative data along with the frequencies for the percentages and categorical data.

RESULTS

Out of total 112 respondents 24(21.4%) were independent journal studying, 56(50%) were of graduate and 32(28.6%) were having other qualification not mentioned in questionnaire. Out of 112 respondents 16(14.3%) were school psychologist 8(7.1%) were teacher of cognitively disabled 72(64.3%) were class room teachers and 16(14.3%) belong to other profession not mentioned in questionnaire. Out of 112 respondents 8(7.1%) were using standardize test always 56(50%) were using sometimes, 24(21.4%) were using infrequently and 24(21.4) never use standardize test for client native language. Out of total 112 respondents 40(35.7%) always use developed local norms, 40(35.7%) were using it sometimes, 8(7.1%) were using infrequently and 24(21.4%) never use the developed local norms.

Table I: Highest Degree Obtained

Variables	Numbers	Percentage	Cumulative Percent
Graduation	38	64.3	64.3
Master	1	0.98	92.9
PHD	30	53.8	100.0
Total	112	100.0	

Out of total 112 respondents 8(7.1%) were assessing 11-20 minutes, 56(50%) on21-30 minutes, 32(28.6%) were assessing 31-40 minutes and 16 (14.3%) take 41-50 minutes when assessing pre assessment activities. Out of total 112 respondents 8(7.1%) were assessing in 5-10 minutes, 16(14.3%) were assessing 11-20 minutes, 64(57.1%) were taking 21-30 minutes and 24(21.4%) were taking 31-40 minutes during formal and informal assessment.

Table II: Phonological Assessment: Areas that Describe the Phonological Assessment Training

Variables	Numbers	Percentage	Cumulative Percent
Independent	24	21.4	24.4
Jounal Study	56	50.0	71.4
Graduate Study	32	28.6	100.0
Total	112	100.0	

Table III: Phonological Assessment: Professionals are typically involved in the assessment of your client

Variables	Numbers	Percentage	Cumulative Percent
School Psycholgist	16	14.3	14.3
Teacher of the Cognitively Disabled	56	7.1	21.4
Classroom Teacher	72	28.6	85.7
Total	112	14.3	100.0

Out of total 112 respondents 72(64.3%) were having Master level Degrees, 4 (0.98%) were PhD and 8 (53.8%) were having other qualification not mentioned in questionnaire.

Table IV: Phonological Assessment: The most typical parent involvement during the assessment process

Variables	Numbers	Percentage	Cumulative Percent
Completes Mall-In Case	8	7.1	7.1
History Form Live Interview Phone Interview	80	7.1	14.3
Accompanles Child during	40	35.7	50.0
Assessment	32	28.6	78.6
Parent/ Child Play During	24	21.4	100.0
Assessment	112	100.0	

Out of total 112 respondent 8(7.1) were assessing by their self and 104 (92.9%) were assessed by audiologist for screening test

Table V: Phonological assessment: Hearing screening is conducted as part of the assessment who typically administers the screening

Variables	Numbers	Percentage	Cumulative Percent
My Self	8	7.1	7.1
Audiologist	104	92.9	100.0
Total	112	100.0	

DISCUSSION

There is no one test being used among speech therapists for assessment of speech disorders. The present study revealed that speech therapists here in Pakistan consisted of vast variety in their routines, preference patterns and skills about using variety of assessment tools. The present study showed that speech therapists even start from hearing screening as a part of hearing assessment. This on one hand reflects that how information technology have prevailed this area of health care too, on other hand reflects the skill of therapists involved that all speech therapists are aware enough of new computer technology being used in their field. This aspect matches with international patterns, where all the computerized equipment is being used [15-16].

The frequency of use markedly increased here. Although cross cultural adaptation solution discussed earlier is ultimate one, but for time being speech therapists are using scales with change norms according to the needs, culture and understanding of Pakistan. However, their validity is questionable. So, refer to the ultimate solution i.e. cross cultural adaptation. Internationally there is very less literature which would support use of tools with changed norms on therapist level [21]. Formal testing procedures and tests questions revealed that Bertha Banks on test of Phonology is not being used. Very less proportion found using it while international literature shows its wide use [22]. Among tests and procedures Fisher Longman had maximum use frequency.

Then Goldman Tristoe Test, then Hodson Test, after that is Khan Lewis Test the least used. Irrespective of their use internationally, there is much reduced use of these validated tools. What is mostly used is

clinical assessment methods [23-26]. This showed that speech therapists are aware of these tools but use of these tools is not part of their practice. Major barrier may be different native language of tools that neither feasible for therapists nor the patients or parents. Use is also influenced by trend in market and academic training institutions. Senior speech therapists are using Fisher Longeman Test because it is old one [27], and accepted among speech therapist. Also the marketing forces may act in its enhanced use [28-30]. Clinical examination is the main procedure being used in speech therapy practice in Pakistan. It is easy to conduct for most therapists despite the fact that it require more expertise before to interpret results as an independent clinician. It requires more practice, more trials and errors. But once clinicians are expert in it, they are individuals with possessing strong clinical judgment and decision making [3,31].

CONCLUSION

The most frequent tests used for assessment for Speech Disorders are Fisher Logeman Test, Goldman Fristoe and Bankson Test. And majority Speech therapists also prefer to use prolong Directive Method of assessment through functional activities.

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Google' is not a synonym for 'research'.

Dan Brown

Journal of Riphah College of Rehabilitation Sciences

ORIGINAL ARTICLE

Effectiveness of Force Closure Stability Exercises with Core Stability Exercises in patients with Mechanical Low Back Pain

Muhammad Furqan Yaqoob[1], Syed Shakil-ur-Rehman[2], Naureen Tassadaq[1], Shakeel Ahmad[2]

ABSTRACT

Background: Strengthening of core muscles has a key role in the physical therapy management of mechanical back pain and current study was designed to compare two types of core muscles strengthening exercises, including forced closure and core stability.

Objective: The objective of the study is to compare the effectiveness of forced closure and core stability exercises for the strengthening of core muscles in patient with mechanical back pain.

Methodology: This Randomized control trial (RCT) was conducted in department Rehabilitation Fauji foundation hospital, Rawalpindi from July 2014 to January 2015. A total 30 patients with mechanical low back pain were selected and placed into two groups i.e. group A and B. Group A were treated with forced closure exercises, while group B with core stability exercises for 6 weeks at 5 days per week. Visual analogue scale (VAS) and function on Oswestry Disability questionnaire (ODQ) were used as assessment toll and measured at baseline and at completion of 6 weeks intervention.

Results: Results showed that clinically both exercise regimes improve pain and function, but the patient in group A improve pain (mean VAS score from 3.73 to 1.47) and function (mean ODQ score from 48% to 22%) more than patients in group B with (mean VAS score from 3.67 to 2.73 and mean ODQ score from 43% to 36%). Statistically result of patients treated with force closure exercises were more significant (p value for pain and ODQ score =0.000, and p-value for ODQ 0.000) than group of patient treated with core stability exercises (p value for pain= 0.002, and p-value for ODQ score 0.003).

Conclusion: It is concluded that the forced closure exercises improves pain and function more than core stability exercises along with routine physical therapy management in patient with mechanical low back pain.

Key Words: Abdominal Strengthening Exercises, Core Stability Exercise, Forced Closure Stability Exercises, Low Back Pain.

1. Fouji Foundation University, Rawalpindi
2.Riphah International University, Islamabad
Corresponding Author:
Muhammad Furqan Yaqoob
(mfurqan_pt@yahoo.com)

INTRODUCTION

Low back pain is one of the most common causes of disability in all over the world. The prevalence of low back is 80% at some stage in our lives [(1)]. Core stability exercises has important role in fitness and rehabilitation program [(2)]. There are several studies which showed that core stability exercise is an important component in treatment of low back pain [(3)].

Core stability exercises are usually used to strengthen the muscles of abdomen, lumber and pelvic [(4)]. The muscles related to core stability are multifidus, transverses abdominis, external/internal oblique abdominis, paraspinalis, gluteus, diaphragm in rear part, and hip muscles [(5)]. The prevalence of back pain in developing countries among farmer was 72% in Nigeria, 56% in Thailand and 64% in China [(6)]. Exercise therapy is best option for the management of low back pain [(7)].

There are different exercise approaches for management of low back pain ranges from simple strengthening and endurance exercises to specific muscle coordination and control. It is suggested that improving control and stability reduce mechanical irritation and this cause pain relief [(8)].

Recently the focus of core stability training is on transverses abdominis and lumber multifidus. The co contraction of these muscles increases individual trunk stiffness and intra-abdominal pressure with minimum load on spine. Force closure exercises are used to increase closure and hence increasing stability and therefore called self bracing or self locking of the joint. This suggests that such exercises are more effective chronic low back pain

[9]. The purpose of the current study was to determine effectiveness of force closure stability exercises with core stability exercises in patients with mechanical Back Pain.

METHODOLOGY

This is a randomized control trial (RCT) study which was conducted from July 2014 to January 2015 at Out Patient Department of Physical Therapy and Rehabilitation, Fauji Foundation Hospital Rawalpindi. A total 30 diagnosed patients of mechanical low back pain were selected and randomly placed into two groups A and B. Group A consist of 15 patients and were given force closure exercises and group B also consist of 15 patients were given core stability exercises. The inclusion criteria were patients of both genders with mechanical low back pain of age ranged from 11 to 60 years, while patients with postoperative, trauma, scoliosis, and lesthesis were excluded.

All the patient were assessed at the baseline before intervention and at the completion of 6 weeks intervention period for pain on visual analogue scale (VAS) and function on Oswestry Disability questionnaire (ODQ). The title was approved from Research Ethical Committee of Riphah International University. Data was analyzed with SPSS version 20 and paired test was applied at 95% level of significance to determine the statistical results for both the techniques.

RESULTS

A total thirty patients with mechanical back pain were included in this study and were placed randomly into two groups. The baseline characteristics were similar in both groups. Results showed that clinically both the types of core strengthening exercise improve pain and function, but the patient in group A treated with forced closure exercises improve pain (mean VAS score from 3.73 to 1.47) and function (mean ODQ score from 48% to 22%) more than patients treated with core stability exercises with (mean VAS score from 3.67 to 2.73 and mean ODQ score from 43% to 36%). Both treatment techniques improve function from severe disability to moderate disability. Independent t test between the groups and paired t test within the group were applied to analyze the treatment effect. Statistically the results of both the groups were significant with minor difference.

Table I: Frequency Distribution of Gender

Gender	Frequency	Percent %	Cumulative Percent
Male	18	60.0	60.0
Female	12	40.0	100.0
Total	30	100.0	

The patients group treated with force closure exercises were more significant (p value for pain and ODQ score =0.000, and p-value for ODQ 0.000) than group of patient treated with core stability exercises (p value for pain= 0.002, and p-value for ODQ score 0.003).

Table-II: Paired Sample Statistics for VAS and ODQ scale.

Study Group (N=30)	Group A (n=15)		Group B (n=15)	
	Pre treatment	Post treatment	Pre treatment	Post treatment
Mean ± SD score for VAS on 0-10	3.73±0.458	1.47±0.516	3.67±0.488	2.73±0.594
Mean score for ODQ scale on percentage %	48 ±10	22 ±6	43 ±11	36 ±4
P Value pain	0.000		0.000	
P value for ODQ	0.000		0.000	

DISCUSSION

In this study, the variables were compared after the 6 weeks of physical therapy intervention, including Force closure exercises in group A and core stability exercises in group B. The patients in group A showed significant and more rapid improvement in pain and function as compared to group B. According to Willard et al force closure reduces the joint's 'neutral zone' thereby facilitating stabilization [10].

This study showed that both types of exercises improve pain and function. Kibler and colleagues conducted a study on the importance of core muscles and its stability in athletes. They con-

cluded that during rehabilitation of back problems in athletes core muscles restoration should be taken as a component and also considered it as a base for extremity function [11].

Another study conducted by Han and group on the effects of lumber stabilization exercises on pain and range of motion in shoulder. They concluded that shoulder pain and range of motion improved in patients treated with core stability exercises group. The core muscle strengthening exercise not only improved lumber stability but also improve upper and lower extremity function [12]. In our study not only pain decrease with exercises but also function improved.

Rafiq et al. conducted a randomized control trial on patients with mechanical low back pain and concluded that specific lumber mobilization combined with core stability exercises improves pain and function while applied in patients with mechanical low back pain [13]. Our study also revealed that both types of exercises improve function and decrease disability.

A study conducted by Rathod and colleagues on the effectiveness of core stability exercise in clerks with low back pain while compared with routine physical therapy management. They concluded that core stability exercises are more effective in treating clerks with low back pain [14].

CONCLUSION

It is concluded that the forced closure exercises improve pain and function more than core stability exercises along with routine physical therapy management in patient with mechanical low back pain. It is further recommended for study on the topic with large sample size and duration of intervention more than 6 weeks.

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ORIGINAL ARTICLE

Common Co-Morbidities Associated with Language Delay

Sumera Nawaz Malik[1], Sikandar Ghayas Khan[1], Ammara Nusrat[2]

ABSTRACT

Background: Language delay is a failure in children to develop language abilities on the usual developmental chart. Children are considered to have speech delay if their speech development is considerably below the norm for children of the same age.

Objective: The objective of the study was to establish the association between co-morbid conditions and language delay.

Methodology: A cross-sectional survey was conducted through questionnaire using convenient sampling technique. Data was collected from parents and children. Data of 55 children between the ages of 2 to 6 years with language delay referred for a psychiatric in Mayo Hospital, Lahore were included.

Results: The findings of this study showed high prevalence of language delay in males than females and significant co-morbidity associated with language delay are intellectual disability, Hearing Impairment and Global Developmental Delay. According to the results frequency distribution for gender of children is 82% were male and 18%were female. Language delay was more prevalent in children with intellectual Disability (33%), Global Developmental Delay (12.7%) and Hearing Impairment (12.7%). Other co-morbidities include Epilepsy (7.2%), Attention Deficit and Hyperactive Disorder (5.5), Autism (3.6%) and Physical Disability (3.6%).

Conclusion: Exact cause of language delay is unknown but there are much co-morbidities associated with it. These co-morbidities have significant association with normal development. To avoid delay in normal development of language, it is important to consult pediatrician, neurologist, audiologist, psychologist, and speech and language pathologist on regular basis depending upon the type of co-morbidity.

Key Words: Language Delay, Co-morbidities, Language

1. Riphah International University , Lahore
2. Hamza Foundation Academy for Dear, Lahore
Corresponding Author:
Sumera Nawaz Malik
(sumera.nawaz@riphah.edu.pk)

INTRODUCTION

Language development is thought to proceed by ordinary processes of learning in which children acquire the form, meaning and use of words and utterances from the linguistic input[(1)]. This phenomenon tells that human species have an innate ability of language acquirement, this developmental process makes language acquisition possible and practically certain, it also reveals that environment is helpful in language possession[(2)]. The acquisition of language is a striking developmental achievement of preschool years. Clinically significant deficits in hearing, intelligence or oral motor function are often accompanied by abnormal speech and language acquisition[(3)]. Study conducted by Chaimay and Thinkhamrop for assessing Risk factors associated with speech-language problems in childhood concluded that there were inconsistent risk factors including antenatal care, environmental factors, gender, family history and Specific language impairment. Many other Studies also demonstrated that former established factors affect speech language development: Such factors should be taken into account as perplexing factors in further development[(4)].

If speech delay persists it may lead to severe problems and adverse effects on education, psycho-social development and literacy skills of a child. Speech delays are primary when there are no secondary issues and co-morbidities. While they are considered secondary when some other causes are coupled with it e.g. syndrome or other conditions which include Hearing Impairment, Down's syndrome and many others, the delays are secondary[(5)].

More disorders include expressive language disorder, social deprivation, autism, elective mutism, receptive aphasia and cerebral palsy.

Other than the maturational delay and bilingualism, speech delay might have secondary significance. During the session of history taking and physical examination, general practitioner can make diagnosis on the grounds of these observations, knowledge and experience. Importance of timely detection and treatment cannot be denied for the betterment of the emotional, social and cognitive deficits of disability[6].

Treatment and timely detection importance can never be ignored for the advancement of social, emotional and cognitive insufficiencies. To understand the speech and language development literature has provided with different contexts of theorists such a Piaget, Chomsky and Skinner. Who believed that children are active learners in their environment and their speech and language is significantly influenced by those environmental factors. Moreover parents play important role in modeling and reinforcing as communication is a learned behavior formed through interaction with other persons. With out this important factor the child won't be able to produce the sounds of its language successfully regardless of how much the physical maturation proceeds. That's why in this study we also focused on the role of factors affecting the child[7].

Any deficiency in communication can bring not only retardation in orderly development of child's different aspects but also can worsen the condition in terms of hindrance in cognitive development and personality development[8].

All above mentioned risk factors and problem can cause delay in early physical growth in terms of both fine and gross motor skills development and more seriously can be associated with delays in language and cognitive development. Furthermore, these negative and devastating outcomes in their growth have both direct and indirect impacts on social development negatively such as behavioral and emotional problems[9].

This study was conducted to find the most prevalent co-occurring condition in children with language deficit, which are responsible for creating hindrance in normal developmental pattern of language acquisition.

METHODOLOGY

A cross-sectional survey was conducted using convenient sampling technique. Data of 220 children between the ages of 2 to 6 years with language delay referred for a speech and language evaluation in Mayo Hospital, Lahore were included.

Sample size was calculated with reference to similar study conducted in North India to examine the relationship between cumulative biological and environmental risk factors on the language development of children[10].

Data was collected in direct interview with parents or caregivers in a formal sitting, using record sheet from the literature and expert opinion. Data was analyzed using SPSS software and endnote was used for references.

RESULTS

Distribution of study sample is shown in Table 1. Sample of 220 children was taken.

Table No. 1 Distribution of co-morbidities in the sample

Co-morbidities	Percentage %
Intellectual disability	33
Global Developmental delay	12.7
Hearing impairment	12.7
Epilepsy	7.2
Attention deficit and hyperactive disorder	5.5
Autism	3.6
Physical disability	3.6

The findings of this study showed high prevalence of language delay in males than females and significant co-morbidity associated with language delay are intellectual disability, Hearing Impairment and Global Developmental Delay. According to the results frequency distribution for gender of children is 82% were male and 18%were female. Language delay was more prevalent in children with intellectual Disability (33%),

Global Developmental Delay (12.7%) and Hearing Impairment (12.7%). Other co-morbidities include Epilepsy (7.2%), Attention Deficit and Hyperactive Disorder (5.5), Autism (3.6%) and Physical Disability (3.6%).

Figure No. 1 Distribution of Study Sample

DISCUSSION

An epidemiological study conducted by Shriberg, Tomblin and McSweeny showed that prevalence of speech delay in children is 3.8% of the age 6 years. However, the etiology of speech delay is unknown; many variables have been described as potential risk factors which include male sex, factors associated with socioeconomic disadvantage and family history of developmental Speech-Language Disorder. According to their results Speech Delay was more prevalent in boys than girls, in children from urban than from rural areas [10]. Same results were exhibited in current study; males are five times more susceptible to develop language delay.

In North India, sample of 253 children were evaluated to examine the relationship between cumulative biological and environmental risk factors on the language development of children. The most detrimental effects on child's language arise when multiple biological factors are there (preterm birth, low birth weight, history of birth asphyxia) that leads the child towards the realm of delay in cognition, language and physical development [11]. According to a study conducted in Serbia most common cause of expressive language delay is Intellectual disability which accounts more than 50% of cases. Relatively to other fields of development, expressive language development is considerably more delayed in intellectually disabled children [8]. Data of current study also support the fact that language delay is mostly associated with problem in cognition (33%), physical development etc.

Global developmental delay and intellectual disability offer challenges to the practitioner at several levels e.g. recognition of most common of subtypes of neuro developmental disabilities is a central precondition to their correct evaluation and management [12]. Global developmental delay is the 2nd highest co-morbidity (12.7%) in current study that is associated with children with language delay.

It is a common observation that predominantly lower mean language score is seen in intermediate and adolescent epilepsy group. Young individuals' language competence is more affected than those of adults and intermediates. Deficits in language aspects are associated with linguistic deficits in young children group are seen mostly associated with long duration of illness. Majority of children in this study are with organic problems [13].

Keeping in mind that first five years of life are the most important in achieving the therapeutic goals, early Intervention has a great significance in child's development [14]. There are risk factors identified among children having speech language problems and have showed significance association, some of them are: being only child, being male, having history of speech-language variations in family and prematurity. Children exhibiting one or more aforementioned risk factors must be intermittently followed-up for better communication development and if required referred for early intervention [15].

CONCLUSION

Organicity is an important factor that can cause hindrance in normal development of language. Language delay along with co-morbidities is seen frequently in patients reporting for speech and language evaluation. Significant co-morbid condition that probes the child more towards the language delay are the Intellectual Disability, Global Developmental Delay and Hearing Impairment. Although exact cause of speech and language delay is unknown yet but these biological conditions

have a noteworthy role.

RECOMMENDATIONS

On the basis of the results it is concluded, it is observed that there is an immense need to identify the co-morbid conditions responsible for crafting delay in normal developmental pattern of speech and language. Significance of early investigation and intervention is evident from literature. Communication is a social right and steps should be taken for the better speech and language development of children suffering from organic conditions.

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Great scholars do not solve problems they create them.

(Albert Einstein)

Journal of Riphah College of Rehabilitation Sciences

ORIGINAL ARTICLE

Physiotherapy Students' Attitude towards Physiotherapist-Patient Relationship

Maryam Shabbir[1], Faryal Aftab[2], Sarah Ehsan[3], Usman Janjua[4]

ABSTRACT

Background: The physician-patient relationship has been bedrock of care since all the times. This relationship is essential in the transference of health care facilities, treatment plans, diagnosis and improvement in the medical fields.

Objective: The objectives of the study are; to explain and quantify the attitudes of physiotherapy students, undergoing pre-clinical rotations, towards patient-centred approach and to measure the association/statistical significance in these attitudes and demographic data and to determine the factors associated with patient centered attitude.

Methodology: This is an observational cross sectional study. It was done at department of physical therapy Azra Naheed Medical College, University of Lahore and School of Allied Health Sciences. Study was completed in 4 months after the approval of synopsis. Non-probability, purposive sampling was used. Sample size was calculated to be of 215 students. Self-administered questionnaire consisting of validated 18-items, Patient Practitioner Orientation Scale (PPOS) was used to find out the attitude of physiotherapy students towards physiotherapist-patient relationship.

Results: The total mean score and standard deviation of all the 18- items of PPOS scale was 3.025 ± 0.46. The mean and standard deviation of sharing item was 3.08 ±0.62, while the mean and standard deviation for caring items appeared to be 2.94±0.59. The range of total PPOS score was 3.42, maximum value being 4.68 and minimum 1.26. Females showed more patient centered approach with a value of 3.05 ± 0.55 than males (Mean ± SD=2.92 ± 0.45). The mean and standard deviation of family in medical profession for PPOS had almost same values. The gender*year interaction was not statistically significant because the P-value was greater than 0.05 (P-value=0.067). But the gender and year individually had statistically significant difference as the P-values of both variables were less than 0.05. Gender (p = 0.04) and year (p = 0.02).

Conclusion: The total Patient Practitioner Orientation Scale (PPOS) mean was high for female gender and early years of medical school. This showed that the factors that were responsible for the patient-centered attitude of physiotherapy students, these were female gender and early years of medical school. Male gender was found to be associated with physiotherapist-centered approach irrespective of the year of medical school.

Key Words: Physiotherapist-Patient Relationship, Physical Therapy, PPOS Tool.

1. Riphah International University, Lahore Campus
2. Bahria Town Hospital, Lahore
3. Superior University, Lahore
4. Gujranwala Institute of Physiotherapy, Gujranwala
Corresponding Author:
Maryam Shabbir
(maryambutt85@hotmail.com)

INTRODUCTION

The physician-patient relationship has been a bedrock of care since all the times.[1] This relationship is essential in the transference of health care facilities, treatment plans, diagnosis and improvement in the medical fields. Medical ethics is all about developing, maintaining, fostering and improving this relationship. The medium of communication between physiotherapist and patient is medical interview. The relationship is directly proportional to the quality and amount of information shared by the patient[2].

According to the patients decisions about their compliance were rational but couldn't be predicted by their therapists [3]. Gyllensten et al concluded that the skills of Interaction of the physical therapists with the patients result in better health outcomes therefore more emphasis should be placed on the reflective skills of the physical therapists [4]. Kaplan, Greenfield and Ware concluded that physician-patient relationship might have an important effect on the health related outcomes of Patients and it must be taken into consideration by the current healthcare system [5]. The amount of time spent together is of less important than the perception of being heard and the feeling that they are the main focus of the issue.

A better organized system also affects the physio-

therapist-patient relationship. With the increasing health consumerism, knowledge and patient empowerment, the patient centered care is being emphasized. Patients want them to be included in the health care as respected partners and desire to be involved in the decision making process [6]. PCC is thought to be the centre of cultural competency [7] and basis of humanistic care delivery to the people suffering from socio-economic downfall [8]. Many studies have suggested that use of PCC in professionals has resulted in better outcomes in a lot of disease processes [9]. The more the patients recognize their health care professionals to be more focused and caring about them, the greater is their mental and physical recovery [10].

METHODOLOGY

This observational cross sectional study was conducted at department of physical therapy Azra Naheed medical college, University of Lahore and School of Allied health sciences. Data was compiled at Riphah international university Lahore. Study was completed in 4 months. The Sample size of 215 undergraduate physical therapy students was taken from a population of 467 students and we used 5% level of precision. Both male and femaleStudents of 3rd, 4th years of Bachelors of Science in physical therapy and students of 5th to 10th semesters of Doctor of physical therapy were included. Students having no clinical experience and those students studying physiotherapy assistant course were excluded from the study.

All 215 students fulfilling inclusion criteria from department of physical therapy Azra Naheed Medical College, University of Lahore and School of Allied Health Sciences, Lahore were taken. Informed consent was taken and then socio-demographic data (like name, age, contact information, gender) was obtained. Questionnaires, that took 20 minutes to complete was given to students to assess their approach towards physiotherapist-patient relationship. Patient Practitioner Orientation Scale (PPOS) was used to assess their approach [11]. Respondents were asked to rate their agreement or disagreement with individual items on a 6-point scale. The overall Patient Practitioner Orientation Scale (PPOS) score was computed as the mean of the scores for 18 items. Sharing and caring scores was computed as the mean of the scores for nine items in each dimension, respectively. For this study, the calculated mean scores ranged from a value of 1 (¼ physiotherapist-centered) to 6 (¼ patient-centered).

All collected data was organized and analyzed by computer program SPSS version 20. Mean ± standard deviation were calculated for quantitative variables while frequency (%) was used for qualitative variables. Total score of Patient Practitioner Orientation Scale (PPOS) tool was calculated and mean± Standard deviation for individual attributes. Factorial analysis of variance was used to determine the significance of gender, family in medical profession, semester and year. Student; t-test was used to measure the means and mean differences of total Patient Practitioner Orientation Scale (PPOS) score and demographic data. P-value $\leq$ 0.05 was considered significant.

RESULTS

The mean of year of study for PPOS had slightly different values. The value of mean for 3rd year students was 3.12 ± 0.46 and the value of mean score of PPOS for 4th year students was 2.91 ± 0.56. The variability of year of medical study and total PPOS score was about the same as the P- value was greater than α (0.05) i.e. 0.49. While there was statistically significant difference between the means of two variables as the P- value was less than α (0.05) i.e. 0.004. So the null hypothesis was rejected, it means that the means of total PPOS and year of medical school were not equal.

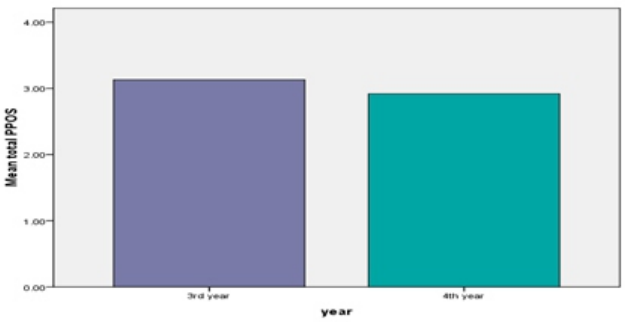
This figure shows the mean PPOS scores of male and female students per class, the approach of male and female students was different in 3rd year, female students being more patient-centered (Mean ± SD 3.23 ± 0.45) in regard to Physiotherapist-patient relationship than male students (Mean±SD2.93 ± 0.43). While in 4th year there was almost no difference among the opinions of both genders.

Table- I: Interactions among gender, year of medical school and total PPOS

Variables	Mean Square	P-value
Gender	1.134	0.040
Year	1.382	0.023
Gender-Year	0.899	0.067

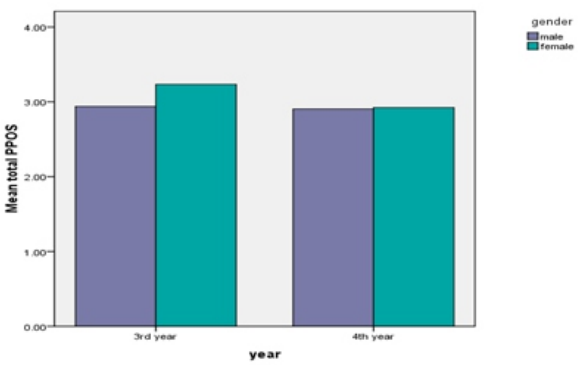
This table shows us the effect of independent variables on dependent variable.

Figure- I: Student's t- test between PPOS and year of study



The gender*year interaction was not statistically significant because the P-value was greater than α i.e. 0.067, so the null hypothesis was not rejected, it there was no interaction present between the variables, both of the variables were independent. But the gender and year individually have statistically significant difference as the P-values of both variables were less than α. Gender (p = 0.04) and year (p = 0.02).

Figure- 2: Factorial analysis of variance for PPOS gender and year of study



So the null hypothesis was rejected, which means, there was significant difference in total PPOS score in males and females, similarly there was significant difference in total PPOS score for 3rd and 4th year.

DISCUSSION

The physiotherapist-patient relationship is very important both for the development of the field as well as the reputation of individual physiotherapist among the clients and the physiotherapy community. This study was aimed to show the attitude of Pakistani physiotherapy students towards their patients as no such study has been conducted in past in Pakistan. Regardless of the emphasis laid on by clinical instructors, health care administrators, practicing physiotherapists on the importance of curricula that nurture the growth of patient-centered attitudes in the newbie's of physiotherapy field in Pakistan, our study suggested that the attitudes of students were more physiotherapist centered than patient-centered. Previous researches have shown that medical interventions made during pre-clinical years designed to improve patient-centered attitudes in students are masked by the personal clinical experiences of the clinical years resulting in more physician-centered attitude in the fresh ones of medical field [12]. Our data supported this fact that despite of international importance of patient-centered approach, the data suggested that the clinical curricula and environment were not sufficient enough to foster the patient centered attitudes in students; these points need to be pondered upon.

Most of the students in third year of medical education showed patient-centered approach but the students of final year were more physiotherapist-centered. This shows that as the year of medical education increases the approach of the students become more and more physiotherapist-centered. In order to overcome this threatening scenario educational reforms are needed to be made in the pre-clinical and theoretical curricula. The differences depicted in different years of medical education with respect to gender showed that in the early years of medical education the female students were more patient-centered, but as the year of education increases their attitude changes and

declined to physiotherapist-centered. But the males were consistent in their results and depicted more physiotherapist-centered attitude. This difference may have existed due to the gendered patterns of communication in males and females. Early researches show that students enter the medical schools with a high degree of idealism but as they experience the hardships of clinical practice, the idealism flew away and the students start to think more about their own interests [13].

This difference in attitudes of students with respect to gender and medical year was also studied individually with the subscales of PPOS. Further study and understanding of this gender related difference among students is needed to be explored. It is important to note that this study measured attitude towards physiotherapist-patient relationship rather than actual patient-centered behavior. This study has several limitations; the sample size used was small. The results of attitude of students were taken only once, so the comparisons made for the medical years/semesters may not be indicative of attitudinal changes in students as different classes were taken and compared. The generalization of our data is affected by the year/annual system, as the course and curricula is not same for both of them.

CONCLUSION

The total PPOS mean was high for the female gender and early years of medical school. Mean of the sharing sub-score was higher than the mean of caring sub-score; this showed that overall trend of the students was patient-centered. No association was found between the total PPOs and the mean of family member in medical profession, this showed that presence of any family member in medical profession did not affect the attitude of students towards their relation with patients. Special reforms are needed to be made in the curriculum to make the students learn about communication skills with the patients. Further studies in this regard are recommended, as no such study has been previously conducted in Pakistan.

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Journal of Riphah College of Rehabilitation Sciences

ORIGINAL ARTICLE

Satisfaction among Physical Therapy Educators about Current Physical Therapy Education in Pakistan

Ibad Ullah[1], Asghar Khan[1], Abdul Ghafoor Sajjad[1], Aamer Naeem[1]

ABSTRACT

Background: Physical therapy is a growing profession with emphasis on continuous improvement of knowledge and skills. Physical therapy educators have to be vigilant enough to stay up to date as they are the role models of the students. These educators also face certain hurdles which can affect their performance badly.

Objective: The objective of this study was to determine the level of satisfaction among educators about current physical therapy education in Pakistan.

Methodology: A cross sectional survey was designed to carry out the study from October 2013 to April 2014. Purposive sampling technique was used to recruit sample. A self structured pre tested questionnaire was distributed among 150 educators working in various teaching institutes in Federal Capital Islamabad, and four provincial capitals. Out of 150 educators, 123 educators filled and returned the questionnaire.

Results: According to the results of the study, 105 (86%) participants were dissatisfied because they believed that physical therapy institutes should be affiliated by health universities only, 120 (98%) participants were dissatisfied because of the non availability of certified faculty in the teaching institutes. All the physical therapy educators showed dissatisfaction due to the absence of physical therapy council to set standards for physical therapy education.

Conclusion: It is evident from the results of study that physical therapy educators are not currently satisfied with education system due to not certified faculty available in the physical therapy institutes and an absence of licensing and regulatory authority to set standards for physical therapy education and clinical practice. Improvement is needed in current physical therapy education standards in the country.

Key Words: Satisfaction Level, Physical Therapy Educators, Physical Therapy Education.

1. Riphah International University, Islamabad
Corresponding Author:
Ibad Ullah
(dr.ibadullah@riphah.edu.pk)

INTRODUCTION

Physical therapy is a health care profession concerned with human movement dysfunction and maximizing functional potential of the patients [(1)]. In the developed countries, Doctor of Physical Therapy program have been started and physical therapists are now recognized as independent practitioners [(2)]. Various medical universities and institutes in public and private sectors of Pakistan have started different programs in physical therapy at undergraduate and graduate level.

Recent literature suggests that educators in colleges and universities in the USA are facing hard times and that quality of teaching and education may be in danger. It has been stated that educators are disheartened, working environment is challenging, and issues concerning teaching and research are time and again conflict-ridden. In particular, junior academicians feel isolated, and their lives are struck by anxiety and stress. The agendas of current physical therapy meetings and publications have been the problems faced by academicians and their effects on educational level[(3)].

In Pakistan most of the health care fields are under the process of development, amongst the health care professions physiotherapy is one of the neglected field. Unfortunately, there is no physiotherapy council for physiotherapy education in Pakistan like; Pakistan medical and dental council, Pakistan Veterinary Medical Council and Pharmacy Council of Pakistan. An effort has been made by the professionals in forming a local regulatory body named Pakistan Physical therapy Association (PPTA) which is working to get a constitutional and

legal status. They have their own limitations like lack of proper leadership, funds and coordination among the professionals and association. Due to lack of a constitutional cover, there has been mushrooming of institutes which are offering sub-standard education, below par facilities and no job security. These reasons have apparently created a lot of dissatisfaction for physical therapy educators in the country and this study intend to assess the satisfaction level and reasons for dissatisfaction [4].

METHODOLOGY

This cross sectional study was done from October 2013 to April 2014 from different physical therapy institutes operating in Federal capital and four provincial capitals of Pakistan. Purposive sampling technique was used. Initially 150 participants were approached out of which 123 responded. All those participants were included in the study that had more than one year experience in physical therapy academics, having at least 4 year graduate degree from a recognized college. Those having less than one year experience and fresh graduates were excluded. Data was collected by self generated pre tested questionnaire regarding level of satisfaction about their profession and physical therapy education.

RESULTS

The response rate of participants in this study was 82% (123). There were 92 (75%) males and 31 (25%) female. Mean age of the participants was 28.75 $\pm$ 2.35

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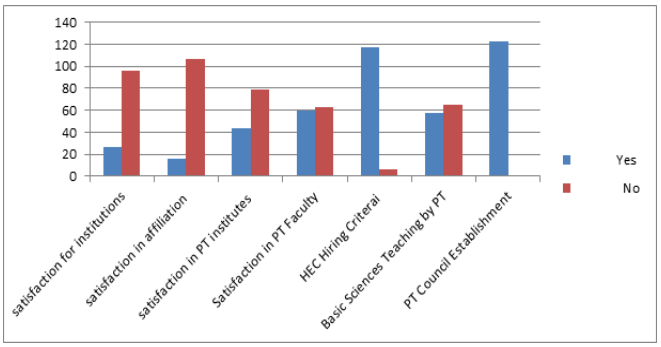
Table 1: showing cumulative results of different themes in study

Themes	Yes	No
Satisfaction among Educators Regarding Institutions Affiliation Criteria	27	96
Satisfaction in affiliation with none medical universities	16	107
level of Satisfaction in Physical therapy institutes infrastructure facilities	44	79
Level of Satisfaction in Physical therapy teaching Faculty	60	63
HEC Hiring teaching faculty Criteria is followed	117	6
Basic Sciences Teaching by Physical therapist	58	65
Physical therapy education satisfaction with Physical therapy Council Establishment	123	0

There were 96 (78%) participants that were unsatisfied with physical therapy institutions affiliation criteria. 107(87%) participants reported that physical therapy program can only be affiliated with medical universities. 79 (64 %) participants revealed that they were not satisfied with physical therapy institutions infrastructure. There were 63 (51%) participants who were expressed their dissatisfaction with current teaching faculties in institutes. 117 (95%) participants reported that all institutes should consider the criterion laid down by HEC for hiring teaching faculty in institutes.

Graph I: showing cumulative results of different themes in study



115 (93%) Participants reported that DPT should be the entry level qualification and 65 (52%) participants reported that basic medical subjects should only be taught by certified subject specialists rather than physical therapist. 87(70%) participants expressed their dissatisfaction with the current salary packages and 123 (100 %) participants reported that physical therapy education standards can be improved with the establishment of physical therapy council. (Results of all themes are cumulatively showed in table and graph I)

DISCUSSION

A study on the quality of education done among the European graduates about the level of satisfaction with higher education explored ratios about satisfaction level among higher education graduates with their post secondary education. Outcomes of this study proved that graduates who were most satisfied with their course of study scored course

content, and social quality very highly while chance to contribute in research task and poor providence of education materials were among the main motive for dissatisfaction with higher education learning[5].

A study on undergraduate nursing students was done which concludes with the requirement to provide evidence for the outcome of laboratories learning and investigate suitable educational methods for effective learning and teaching of practice skills[6]. Regarding results about institutions infrastructure, thirty-five participants of this study agreed that they are satisfied with current physical therapy institutions while sixty-four percent participants disagreed, most of the participants were not satisfied with physical therapy institutions infrastructure/ facilities.

A study about framework for analysis in Physical therapist education supported entry level doctor of physical therapy program for a competent practitioner[7]. Five years DPT program started seven years back in Pakistan, and now every current health university announces admission only in DPT on FSc (Pre-medical) instead of BS Physical therapy as in my study participants were asked about the entry level qualification in which ninety-one percent participants agreed that DPT should be entry level qualification in all physical therapy institutes they showed their satisfaction in DPT education. Regarding results about institutions infrastructure, thirty-five participants of this study agreed that they are satisfied with current physical therapy institutions while sixty-four percent participants disagreed, most of the participants were not satisfied with physical therapy institutions infrastructure/ facilities.

A pilot study on faculty development was done they concluded that training have significant effect to improve basic sciences instructors teaching effectiveness[8].

Another study about teaching skills of education was done, introduced a generalizable framework to other health professions thorough the world. They have taken some steps and resulted in the development of framework which focuses on providing equitable and quality Physical therapy educational opportunities[9].

Fifty-one percent participants were not satisfied with current teaching faculties in institutes as most of the educators are not experienced and well trained. Participants respond that basic sciences like anatomy, physiology and pharmacology should be taught by specialist of these subjects not by physical therapist. Teaching faculty should be certified in teaching methodology for satisfactory outcomes and basic sciences should be taught by specialist teachers for better understand.

Councils are organizations whose members are individual professionals. In some professions it is compulsory to be a member of the professional body. This usually depends on whether or not the profession requires the professional to have a 'license to practice or to be on a professional register in order to do their career. This is related to how the profession is regulated[10].

As in a study the participants were hopeful in future to see their profession developed with the help of professional council and empirical commitments from the government [11]. So hundred percent participants reported in favor of establishment of physical therapy council for the satisfaction of education in the country a government regulating body is key to success for physical therapy education in Pakistan.

CONCLUSION

It has been concluded from the above mentioned findings that physical therapy educators are not satisfied with Physical therapy education as well as services. Most of the institutes do not have proper trained faculty, infrastructure facilities like libraries, physical therapy lab facilities and purpose made infrastructure, affiliation with non medical universities. All the participants were agreed with the establishment of Physical therapy council to upgrade the profession.

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Health is the greatest strength.

Lailah Gifty Akita

Journal of Riphah College of Rehabilitation Sciences

ORIGINAL ARTICLE

Problems Faced by Hearing Impaired Children in Getting Medical Services

Atqia Qureshi[1], Muhammad Sikander Ghayas Khan[2], Ikram Ullah Qureshi[3]

1. Govt Special Education Centre Kot Radha Kishan, Lahore
2. Riphah International University Lahore Campus
3. King Edward Medical University Lahore

Corresponding Author:
Atqia Qureshi
(slt_dream11@yahoo.com)

ABSTRACT

Background: Problems of hearing impairment are the segment of medical domain which is faced by student with special needs. Verity of medical services are available for children with hearing impairment but a very common problem, which exists in Pakistan is the lack of awareness about the importance of medical services and their diagnosis.

Objective: Purpose of study was to identify the problems faced by children with hearing impairment in getting medical services from private clinic.

Methodology: A cross-sectional study was conducted and the convenient sampling technique was used. Population of the study comprised of 70 school children with hearing impairment how were enrolled in class 7th to 10th of public school in Lahore. The instrument of study was questionnaire which was developed in the light of literature review and expert opinion.

Results: 93%(65 out of 70) participants reported that doctors don not understand sign language and all the participants (100%) documented that doctors do not provide them with sign language interpreter. 60% said that doctor do not understand them, 68% said that they don not understand doctors & 71% said they cannot tell the doctors about their disease.

Conclusion: It was concluded that the individuals with hearing impairment do not feel satisfied during the treatment due to the lack of understanding of sign language among the doctors along with the in availability.

Key Words: Hearing Impairment, Medical Service, Doctors, Sign Language

INTRODUCTION

The term hearing loss is referral to all the degree of hearing impairment from slight to deafness [(1)].There are three major types of hearing loss1) Conductive hearing loss, 2) Sensory neural hearing loss, 3) Mixed hearing loss [(2)]. The parents have no awareness about the hearing loss they do not know what to do [(3)]. Physical medical clinical and educational definitions of deafness and hearing loss are similar [(4).] They are based on audio logical measurement of an individual's ability to hear sound of different levels of pitch and loudness [(5)]. Specialists compare these measurements with average hearing levels to determine the extent of an individual's hearing loss [(6)]. Number of student born with hearing loss and have bad experience in getting medical service. The main problem is how to communicate with doctor. They are unsuccessful to convey their message to their patient [(7)]. Variety of medical services available for children with hearing impairment but a very common problem, which exists in Pakistan, the person is identified very late [(8)]. The patient has lack of awareness about the importance of medical services and their diagnosis [(9)].

Hearing assessment is a complex procedure which is completed by different subjective and objective tests. These tests are chosen according to the nature of client's hearing loss [(10)]. The history of the services for hearing impaired person in Pakistan is not very long. It has made swift progress during the last few years [(11)]. Directorate General of special being in 1983-84. The main purpose of this department is to provide medical services to disabled and establish rehabilitation center for special children [(12)]. Early diagnosis of hearing impairment in children is vital to the interest of the linguistic intellectual social and emotional development of children [(13)]. But at very rightly indicated by NasimYousaf, Pakistan is a developing country and has limited medical provision, so there is no proper system of diagnosis of hearing impairment [(14)].

According to World Bank evaluation 63% population live in villages [(15)], the children are mostly born in home assisted by illiterate midwives. Only for major

illness, this rural population goes to qualified doctor. Hearing impairment is rarely detected before the child three and four years old in developing country. When parents feel their child is not talking and not able to respond sound they are taken to Hakim or religious healer or doctor who have limited experience. A few parents who do understand the nature of impairment do go to one of the few audiologists' clinics. In Pakistan (developing country) mostly people do not afford the doctor fee and hearing aid devices [16].

The government is carrying out medical rehabilitation activities through medical rehabilitation activities through the hospital which are located throughout Pakistan during the last few years. Numbers of students born with minor hearing loss can communicate with other persons and get their medical services but children with profound hearing loss have bad experience in getting medical services. The main problem is to communicate with doctors and nurses. For the deaf people sign interpreters, written notes, lip reading, assertive listening device for communication can be selected [17]. Purpose of study is to find out the problems faced by children with hearing impairment in getting medical services.

METHODOLOGY

A cross-sectional study was conducted and the convenient sampling technique was used. Target population of the study was children with hearing impairment of class 7th to 10th in public sector of Lahore. The sample of study consisted of 70 children with hearing impairment from different special school. The instrument of study was questionnaire which was developed within the light of literature review and expert opinion. Questionnaires consist of 10 questions. The researcher personally distributed the questionnaire among 70 hearing impaired children in order to gather information. Data was analyzed by using SPSS.

RESULTS

The table I revealed that 59% (41) of participants do not go to doctors alone, 71% (50) reported that doctors do not listen their problem attentively, 68% (46) documented that they do not understand the doctors. 60%(42) reported that doctor do not understand their disease well and similarly 71% (50) participants reported that thy can not tell the doctor about their disease clearly.

Table: I Response of hearing impaired chidren

Questions	Yes(Y)	No(N)	Y %	N %
Do you go to doctor alone	29	41	41	59
Does the doctor listen your problem attentively	20	50	29	71
Do you understand the doctor	24	46	34	68
Does the doctor understand your disease well	28	42	40	60
Can you tell the doctor about your disease clearly	20	50	29	71
Does the doctor provides you with sign language interpreter	0	70	O	100
Do you tell the doctor about your disease yourself	25	45	36	64
Does your doctor understand the sign language	5	65	7	93
Do you feel that there should be a separate hospital for special people	60	10	86	14
Do you feel satisfaction during treatment	10	60	14	86

100%(70) reported that the doctors do not provide them with sign language interpreters. 64 % (45) participants documented that they tell the doctor about their disease themselves and 93%(65) reported that doctors don not understand the sign language. 86% (60) Participants reported that they do not feel satisfied during the treatment and thus 86% (60) repoted that there should be a separated hospital for people with special needs.

DISCUSSION

In Australia, all people who are Deaf or have hearing impairment have the same right to use facilities as do people with hearing. Therefore, all medical facilities must be accessible to all patients and staff, not just to those with normal hearing. Failure to provide fair access to such facilities means the person who is Deaf or has a hearing impairment is discriminated against and it is illegal to discriminate against people of basis of their hearing/deafness disability [18]. But studies show that 41% hearing impaired children do not go alone. According to American with Disability Act, medical facilities are provided to hearing impaired children in America, they are provided with sign language interpreters when they visit a doctor [19].

The studies show100% children say that no child was provided with the sign language interpreter. 71% hearing impaired children says that they

cannot tell the doctor about their disease clearly. Even 93%childern says that doctor don't understand the sign language Association of Medical Professionals with Hearing Loss (AMPHL) give knowledge, promote advocacy and mentorship, and it also creates a network for persons with hearing loss involved in or working in health care fields [20].

This association also provides online education. AMPHL allows deaf/hard of hearing health care professionals and students to give and receive support from each other regarding obstacles AMPHL helps educate the colleagues and instructors of deaf/hard of hearing health care professionals and students.[21]this study show that 68% hearing impaired children do not know understand the doctor.

Many organizations play very important roles in the health care services for children with hearing impaired. This organization offers help to deaf people if they face any medical problem, they can get rid of their problems and also gets extremely competent sign language interpreters. Interpreters The organizations involved are: Action on Hearing Loss, ASLI (Association of Sign Language), NRCPD (National Registers of Communication Professionals working with Deaf and Deaf blind People),BDA (British Deaf Association), Sign Health, Signature, Action on hearing Loss, BSMHD (British Society for Mental Health and Deafness) Auxiliary Aids and Services in New York [22]. Medical facilities are provided like captioning, maintenance, barrier removal, oral/sign language interpreter, auxiliary aids.These services ensure effective communication with persons with hearing loss in New York [23]. This study shows that 86% children's feel that there should be a separate hospital for special people there should be medical services is provided. The children of hearing impaired feel satisfaction during treatment in UK but Pakistan 86% children says that they do not feel satisfaction during treatment [24].

CONCLUSION

On the basis of the results presented above in detail, it may be concluded that the students with hearing impairment seem to be highly conscious regarding their medical problems. They do not understand doctors' discussion and their prescription.

RECOMMENDATIONS

After the completion of the research following recommendations are given; workshops on Sign language should be conducted to create awareness among the personal working on the field of medicine. There should be a separate counter for hearing impaired patients. Furthermore, sign language interpreted should be provided in private clinic. It may also be recommended that awareness campaign regarding the provision of the facilities of separate counter and sign language interpreter in the clinics should be started on Electronic Media and cyber forum like Face Book, Whats App etc.

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Innovation distinguish between a leader and a follower.

Steve Jobs

Journal of Riphah College of Rehabilitation Sciences

ORIGINAL ARTICLE

Effectiveness of Cervical Mobilization and Cervical Traction in Management of Non Specific Neck Pain

Hamid Ali[1], **Rashid Hafeez Nasir**[2], **Danish Hassan**[2]

1. Hope Rehabilitation Center, Lahore
2. Riphah International University, Lahore Campus

Corresponding Author:
Hamid Ali
(doc.hamid76@gmail.com)

ABSTRACT

Background: Neck pain is described as the pain perceived anywhere between superior nucal line & first thoracic vertebrae. About 60% of the subjects are likely to develop the chronic nature of neck pain if it's not managed promptly.

Objective: This study was designed to determine the effectiveness of manual therapy in comparison with cervical traction in reducing cervical pain and disability.

Methodology: This study is randomized clinical trial in which 38 patients with the non-specific neck pain aged between 35 to 55 years were selected using a non-probability sampling technique from Hope Rehabilitation Centre Lahore. Selected subjects were randomly allocated into two treatment groups with 19 subjects in Cervical Mobilization (Group A) and 19 in Cervical Traction (Group B) using a lottery method. Short wave diathermy& isometric neck exercises were given as standard treatment for both groups. Pretreatment values for pain and disability were recorded on VAS and NDI. Each patient received two treatment sessions per week with maximum six treatment sessions over the period of three weeks. Post treatment values for possible improvement in pain and disability measured on VAS and NDI respectively were recorded at the end of 3rd week.

Results: It was revealed that there was significant difference in VAS and NDI score (p value < 0.05) between the baseline readings and final value at the end of Week 3(after 06 treatment sessions) across both treatment groups. However cervical mobilization proved to be an effective technique in terms of greater reduction in mean VAS (3.83±0.336 compared to 1.706±0.268 in cervical traction group) and NDI (4.056±0.468 compared to 2.647±0.402 compared to cervical traction).

Conclusion: Cervical mobilization is more effective than cervical traction, both in terms of reducing pain and disability in subjects with non-specific neck pain.

Key Words: Neck Pain, Visual Analogue Scale, Neck Disability Index, Manual Therapy

INTRODUCTION

Neck pain is one of most prevalent musculoskeletal disorders among general population after low back pain[1,2]. About 50% of the subjects referred to physical therapist by general practitioners are of neck pain. It is one of the major source of discomfort, pain and disability accounting for high socio-economic burden in terms of cost expended on its treatment and number of days missed from work. Prevalence of neck pain ranges from 45% -60% [3-6]in different studies conducted across different parts of globe.

The review of previous literature has revealed that passive joint mobilization techniques are frequently employed by physical therapist to assess for and treat vertebral dysfunction [7-11]. During assessment, spinal mobilizations appear useful in identifying the symptomatic spinal level [8-12], and deviations from normal accessory motion may be associated with pain [12-13]. When used for treatment, there is good evidence to support the combination of joint mobilization and exercise [14].

In a 2008 systematic review by Schmid et al [13] the authors assessed 15 studies investigating the effects of spinal mobilization alone on pain measures and range of motion. Data were pooled in this review, and the resultant suggestion was that joint mobilization improved outcomes by 20% relative to controls who did not receive mobilizations. Further, similar effects, decreased pain and increased motion, have been observed when mobilization was performed at the asymptomatic level (non-specific level) or at the symptomatic level (the specific level) [15, 16]. The study by Vernon et al15 and that by

Hegedus et al [16] only included studies which examined the effects of joint mobilization and not those studies which combined joint mobilization with other interventions.

Spinal traction is one of the conservative treatments that are frequently used for the treatment of several of type of neck and back disorders [17]. Similarly other studies also reported that there was reduction electro myographic activity of the paraspial muscles along with the widening of inter vertebral foramen that led to reduction in radicular symptoms associated with neck pain [18-21].

A study conducted by Rangones et al [22] found that combination of manual therapy along with cervical traction in addition to baseline treatment of therapeutic exercise to be more effective in reducing pain and disability than any other treatment technique alone. However these results were negated by another study by Young et al [23] that addition of cervical traction to regime of manual therapy and exercise did not yield any significant benefit in terms of reduction in disability, pain or dysfunction in subjects with cervical radiculopathy.

Though cervical traction is a commonly used treatment technique, its efficacy is yet to be determined over other techniques' like passive joint mobilization [24]. There is also no convincing evidence in the previous literature that which sub group of subjects with neck pain are likely to benefit from this technique. Combination of cervical mobilization and cervical traction along with standard baseline treatment have proved be effective in treatment of neck pain but the relative contribution of each technique towards improvement is yet to be evinced. The main aim and objectives of this study was to determine the effectiveness of cervical mobilization versus cervical traction in reducing pain & disability.

METHODOLOGY

This study is a Randomized Clinical Trial. Data was collected from Hope Rehabilitation Centre Lahore and study was at Riphah College of Rehabilitation Sciences Lahore. Study was completed in January 2015 to July 2015 after the approval of synopsis. Patients with the non specific neck pain were selected using a non probability sampling technique from Hope Rehabilitation Centre Lahore. Sample size of 38 patients, with age 35–55 year, of both genders, with pain perceived anywhere in the region of cervical spine, from superior nuchal line to the first thoracic spinous process [25] and limitation of cervical spine range of motion were included. Patients were not included in the study, if they reported any of the conditions like pregnancy, whiplash injuries, medical red flaghistory (tumor, fracture, metabolic diseases, rheumatoid arthritis, osteoporosis, resting blood pressure greater than 140/90mmHg), the neck pain with the cervical radiculopathy, neck pain associated with externalized cervical disc herniation, fibromyalgia syndrome, previous neck surgery and neck pain accompanied by vertigo caused by vertebrobasilar insufficiency or accompanied by non-cervicogenic headaches. Subjects were also excluded if they had received physical therapy in the previous 6 months.

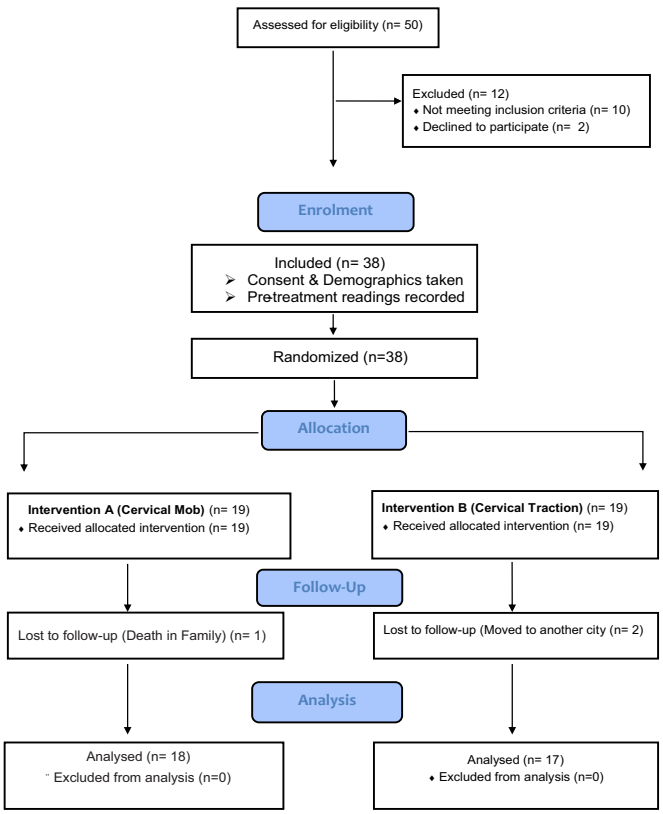
Selected subjects were randomly allocated using a dice roll method into two treatment groups with 19 subjects in Cervical Mobilization group and 19 subjects in Cervical Traction groups using a lottery method. Short Wave Diathermy & isometric neck exercises were given as standard treatment for both groups.

A standardized musculoskeletal examination of the cervical spine was performed to identify the vertebral level to target with the intervention; that is, the level found to be hypo mobile and painful in the manner that matched the patients' primary complaint. Each patient received a total of 06 treatment sessions over 3 weeks.

The patient lay prone and the therapist stood at the head of the patient. His thumbs were placed in opposition at the level of the facet of the hypo mobile cervical vertebra and a unilateral posteroanterior (PA) oscillatory pressure was applied using Grade II and Grade III Maitland's manual therapy techniques. This oscillatory mobilization was performed at a frequency of 2 Hz for 2 min and repeated 3times. The rest time between each mobilization was 1 min.

The patient lay supine with the head resting on a small pillow and the crown of the head even with the

top edge of the table. The therapist cups the patient's chin with the fingers or cups the anterior aspect of the patient's forehead using non dominant hand. The therapist flexes the patient's neck to a position of comfort by lifting the head off the pillow (20-25 degrees from horizontal) and gradually applies a distraction force up to 8-10 kg. Traction force was maintained for up to 1 minute followed by 30 seconds rest interval.



At each treatment visit, participants received three sets of five repetitions of traction with a neutral head position, delivered within the allocated force range.

A Visual Analogue Scale (VAS) [26] was used to evaluate the intensity of the recent pain perceived by the patient. This scale has been documented in previous studies as a reliable and valid measure of pain intensity and it is sensitive to clinical changes in pain. The patient places a vertical mark on a 10 cm horizontal line anchored at one end with 0 (no pain) and at the other end with 10 (maximum pain).

The Neck Disability Index (NDI) is an assessment tool used to record perceived disability in patients with neck pain [27]. The NDI is a self-administered questionnaire with 10 sections: 7 relate to activities of daily living, 2 relate to pain and 1 to concentration. Each of the sections is scored from 0 to 5, and the total score is expressed as a percentage relative to the maximum possible. This scale offers high levels of validity and reliability (Cronbach's alpha score was 0.89); it is stable against different cultural levels and is consistent and reliable [28]. The minimum detectable change is 5 points out of 50, and it is recommended that 7 points is the minimum clinically important difference.

Data entry and analysis was done by using SPSS 18. Quantitative variables were presented by using mean ± SD. Qualitative variables were presented by using frequency table and appropriate graphs where applicable. Paired sample t test was applied to see a significant change VAS and NDI score between pre treatment& post treatment values at the end of 06 treatment sessions with in each group. Independent sample t test was used to compare significant difference in pain and disability between two groups. Chi-square test was applied to see the association between qualitative variables. P-value ≤ to 0.05 will be taken as significant.

RESULTS

The patients were recruited from January 2014 to June 2014. 38 subjects with non specific neck pain were eligible for the study. 35 subjects completed all the assessment. Primary reason for dropout was death in family and migration to another study. Demographic variables like age, BMI and male female ratio are reported in Table I.

Table I: Demographics measures presented by groups, all data presented as Mean (SD)

Characteristics	Cervical Mobilization Group Mean ± SD	Cervical traction Group Mean ± SD
Age (Years)	44.66 ± 6.69	46.76 ± 6.40
BMI (kg/m2)	26.65 ± 3.06	25.34 ± 3.21
Sex M/F (Male)	11/7 (61%)	11/6 (64.7%)

Mean age of the participants in cervical mobilization group was 44.66 ± 6.69 years and cervical traction

group was 46.76 ± 6.40 years. Both groups had higher percentage of male participants compared to female participants.

Table II: Across the group difference for VAS & NDI, with p value

Measure	Group	Baseline	Final	Within Group Change	P value
VAS	Cervical Mobilization	6.55 ± 0.983	2.72 ± 0.826	3.83 ± 1.42	<0.001
	Cervical Traction	6.70 ± 0.581	5.00 ± 0.707	1.706 ± 1.10	<0.001
NDI	Cervical Mobilization	15.05 ± 2.79	11.00 ± 1.49	4.056 ± 1.98	<0.001
	Cervical Traction	14.88 ± 2.97	12.33 ± 2.30	2.647 ± 1.65	<0.001

Across the group analysis was done using independent sample t test which showed that there was significant difference between the two treatment groups with p value < 0.001. Within the group difference was analyzed using paired sample tests. Results demonstrate that there was significant difference across the both treatment group for VAS score and NDI score (Table II). There was a mean difference of 3.83 ± 1.42 across the cervical mobilization group compared to cervical traction group that demonstrated a mean difference of 1.706 ± 1.10. Similar down sloping trend was also observed for NDI score. There was a mean reduction of 4.056 ± 1.98&2.647 ± 1.65 across the cervical mobilization & cervical traction group respectively. Overall there was greater reduction in pain and disability measured on VAS & NDI across the cervical mobilization group compared to cervical traction group. (TableI & Table II)

DISCUSSION

Results of this found that there was significant difference in VAS and NDI score (p value < 0.05) between the baseline readings and final value at the end of Week 3 (after 06 treatment sessions) across both treatment groups. However manual therapy proved to be an effective technique in terms of greater reduction in mean VAS (3.83±0.336 compared to 1.706±0.268 in cervical traction group) and NDI (4.056±0.468 compared to 2.647±0.402 compared to cervical traction).

Results of this study reinforce and augment the fact that manual therapy had a positive significant effect over neck pain. The magnitude of improvement was set at 0.85cm on VAS scale [29], was met with in first week of treatment in manual therapy group and only in second week of treatment in cervical traction group. The short term effects found in this study were also reported by another study conducted by Saavedra-Hernandez et al [30]. There was also improvement in terms of Neck Disability Index across the both treatment group with greater reduction in manual therapy group compared to cervical traction. However none of the both technique exceeded the minimal clinical important detectable difference (MCID) of 7 points on Neck Disability Index. Previous studies have reported the change in NDI score differently. There was significant change of 7 points on NDI following a 6 weeks of manual therapy in s study conducted by Hoving et al [31]. Similarly there was change of 9.6 and 7.9 in NDI after 4 weeks of treatment and 9.3 to 10.8 after 12 weeks; were reported in study by Leaver et al that compared HLVA and mobilization in subjects with non specific neck pain [32]. One possible explanation to this difference might be inclusion of subjects with chronic neck pain that required a greater number of treatment session to produce a significant effect.

Results of this study also found cervical traction to be effective in terms of overall improvement in VAS and NDI score (though less than manual therapy group). A significant change in VAS was only documented after 4 treatment sessions in week 2. There was also significant improvement only in 1st week of treatment in NDI score (p value < 0.05), but later on week 2 and 3 there was no significant reduction in NDI score. Result of this study were further testified by Joghataei et al [33] that registered a short term improvement in grip strength only after 3 weeks of treatment in patients with cervical radiculopathy subjects when they were treated with cervical intermittent traction in supine position. It was further concluded in this study that there was no midterm superiority of this technique over other conservative treatment approaches.

Results of previous studies found cervical traction only to be effective in conjunction with other therapies [33]. A study confirmed that significant reduction in symptoms of radicular pain when they were treated with vertical cervical traction in sitting position with grade I-III spondylosis [34]. 24 out of 26 subjects also recovered effectively when cervical traction was added to their conservative treatment for neck pain [35].

In the study by Cleland et al [36], 11 subjects with cervical radiculopathy were treated with cervical traction along with their previous treatment regime of cervical manipulation and therapeutic exercises. Results showed that there was improvement in pain and function after an average of 7 treatment sessions. Another study [37] used a different technique of traction; cervical bath traction and combined it with electroptherapy and standard therapeutic exercises. The other group received exercises and electrotherapy alone. The combination group receiving cervical traction was superior to other in terms of pain, spinal mobility, function and quality of life parameters at the end of a 15- session treatment protocol and 3 months later. The authors also suggested the use of cervical weight bath traction in cases of radicular pain caused by disc protrusion or cervical spondylosis.

CONCLUSION

On the basis of results of the study it may be concluded that cervical Mobilization is more effective than cervical traction, both in terms of reducing pain and disability in subjects with non specific neck pain.

LIMITATIONS

Lastly, all participants were residents in one area of Lahore with subsequent similarity at s socioeconomic scale and cultural level, making it difficult to generalize the results to other populations that differ from that group.

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Journal of Riphah College of Rehabilitation Sciences

ORIGINAL ARTICLE

Awareness of Vocal Hygiene Education among Government Secondary School Teachers

Humaira Shamim Kiyani[1], Marryum Nadir Kiani[2]

1. Yusra Medical College, Rawalpindi
2. Shifa International Hospital, Islamabad

Corresponding Author:
Humaira Shamim Kiyani
(humaira_pices@hotmail.com)

ABSTRACT

Background: The impact of voice disorders in professionals have a negative effect on the quality of life of those who suffer from them. Voice problems negatively affects their job performance. There is lack of awareness of voice disorders as a work-related disease in most common professionals but voice disorders have been accepted as occupational disorders in some other countries and health care and occupational safety for professional voice users are poor.

Objectives: The objective of study was to find out the awareness of vocal hygiene education among Government teacher.

Methodology: A cross sectional survey was conducted among the secondary school teachers of Islamabad. A sample of 100 female secondary school teachers was selected from the Government school of Islamabad. The participants were asked to rate their responses on a three point Likert rating scale. The version 16 was used to analyze the data. Graphical presentation and table were used to describe frequency, percentage and correlation of variables.

Results: The results showed that the awareness about vocal hygiene was 93.5% among the secondary school teachers. Awareness about the voice disorders is 80.2% but only 58% seek the treatment for voice disorders.

Conclusion: This study concluded that secondary school teachers were aware of the vocal hygiene but did not follow the protocol for management of voice problem. It was due to lack of time for their personal care due to general life stressor like family, socioeconomic status

Key Words: Vocal Hygiene, Voice Disorders, Daily Life Stressors, Teachers

INTRODUCTION

In some occupations voice is the primary tool of trade. Voice professionals often use their voice more intensively than the normal population, and are at high risk for work-related voice disorder. Most of the professions involve use of voice for their trade. The intensive use of voice may be the risk for work related voice problem. Number of professionals, including singers, telemarketers and teachers use their voice extensively. The large number of studies showed that the voice is used for trade in most of the professions [1-5].

Where voice is used as occupational tool, voice disorder are common in those professions. Voice disorders affect the quality of life as well as cause burden on healthcare expenses [6-9]. Voice disorder affects the job performance and 20% of teachers reported the voice problem due to which they missed their workday [8, 10, 11, 12]. Voice disorder becomes as occupational disorders which is an important issue in profession where there is high demand of vocal performance [13, 18, 19]. The primary risk factors for voice disorders are prolonged voice use and factors in the working environment that can have an effect on voice production [13,14,20].

As to voice disorders, teachers have been reported to be statistically over represented in treatment-seeking populations [5, 35]. Persons whose occupations places high demands on the voice might seek help for their voice problems more often than others [14, 35]. However, teachers are not necessarily very active in looking for help.Studies show that only a small percentage of teachers who report voice problems seek professional help [7, 11]. The reasons for this have not been explored but practical and economic causes have been suggested [11, 12]. Teachers might also be ignorant about where to get help, or perhaps help is not easily available. The results of a study by Roy, Merrill, Thibeault, Parsa, et al. (2004) [7] showed that about 14% of the teachers who reported past voice disorders had sought

professional help for their disorder. In some studies only about 1% of the teachers who reported voice problems had sought professional help [10,11].

Teachers might think that their voice problems are a normal inconvenience in their occupation [10, 11], which may account for why they do not seek help at an early stage. Another reason for ignoring to seek early help may be that persons adapt to such adverse vocal symptoms as hoarseness [38]. Voice disorders may also be difficult to diagnose.

The present study is designed to evaluate the vocal hygiene education among teachers. Teachers are more prone to have voice problems because of their work Teachers are at high risk of having voice problems and they have a less the awareness of vocal hygiene education. Teachers are a quite a big part of our population. This study will contribute the knowledge of vocal hygiene education which further helpful development to develop preventive adoptive behavior to reduce the impact or severity of problem.

METHODOLOGY

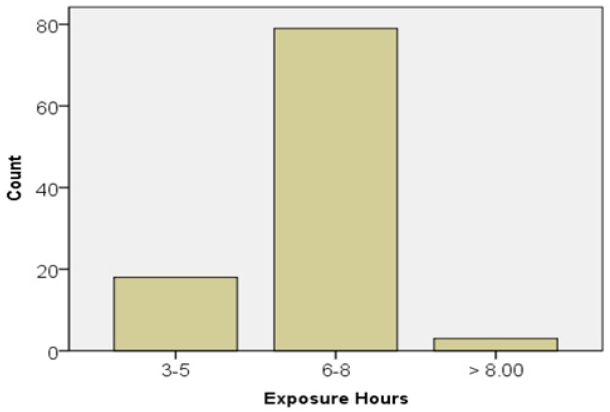
Study design was cross sectional survey. This study was conducted among the secondary school teachers of Islamabad schools. The questionnaire was filled out by the government secondary school teacher's .The Performa's was distributed among them in one setting and was collected after two days .Three Islamabad secondary schools were targeted for sample collection. The duration of this study was six months. The sample size of the study was 100 female Government secondary school teachers of Islamabad. Only Female teachers within the age bracket of 25-40 years having work experience of 5 to 10 years were included in study, whereas, the patients having any medical condition were excluded from study.

The consent form for the ethical purposes, history form for the eligibility criteria for the sample was filled out by the teachers. Awareness about the vocal care was measured by using the questionnaire inquiring about the self assessment of vocal care, vocal capabilities and general life style or stress. The participants were asked to rate their responses on a three point rating scale. Increase in number was shown the severity of responses. Treatment seeking behavior was interrogated with yes or no questions. The SPSS version 16 was used to analyze the data. Graphical presentation and table were used to describe frequency, percentage and correlation of variables.

RESULTS

The survey was designed to investigate the awareness of vocal hygiene education among teachers .A sample of 100 female teachers were selected from government school teachers Islamabad. A questionnaire was distributed along with its three parts of self assessment of vocal care, vocal capability, or stress or general life style. The participants were asked to rate their responses on a five point rating scale .Increase in number will show the severity of responses. Treatment seeking behavior was interrogated with yes or no questions. Following results are described under their headings.

Figure I: Distribution of Average Daily Exposure



The exposure hour is an ordinal variable with three categories. The most common is 6-8 hours exposure among the school teachers; followed by 3-5 hours. The frequency distribution for exposure of hours is given in Table I.

The table 1 showed the comparison of responses regarding the questions asked on vocal hygiene. The table showed the distribution of responses (in percentages) to each question regarding the vocal hygiene among school teachers. The overall awareness vocal hygiene is 61.6%. 26.5% don't

have any voice problem and 6.5% are unaware of vocal hygiene.

Table I: Awareness of Vocal Hygiene among Government Secondary School Teachers

S#	Statement	Agree	Disagree	Don't Know
1.	My voice tires or fatigue	93	5	2
2.	Take sips of water during lecture	28	72	0
3.	Do you speak in unnatural pitch	36	60	4
4.	Resting the voice	28	64	8
5.	Use gestures to attract attention	66	31	3
6.	Keep the head and neck relaxed	32	34	4
7.	Background noises have a impact on voice quality	85	10	5
8.	Speaking over a long distance without amplification	85	15	0
9.	The dust in my working environment has impact on voice quality	83	15	2
10.	Speak in a strained or forced way at class room	80	13	7
	Total Percentage (%)	**61.6**	**31.9**	**6.5**

The table 2 shows the comparison of responses regarding the questions asked on voice problems. The table shows the distribution of responses (in percentages) to each question regarding the voice problems among school teachers. The overall awareness of having Voice Problems among Government Secondary School Teachers is 33.5%. 46.7% don't have aware that they don't have any voice problem and 19.8% are unaware of voice problem

Table II: Awareness of Voice Problems among Government Secondary School Teachers

S#	Statement	Disagree	Don't know	Agree
1.	My voice tires or fatigue	13	21	66
2.	My voice is hoarse,croacky etc	29	48	23
3.	My voice disappears completely	88	6	6
4.	My voice does not project as needed	68	24	8
5.	I have a difficulty in breath control	71	11	18
6.	My throats feels dry	36	13	51
7.	I feel tickling in my throat	26	22	52
8.	I feel I have a lump in my throat	77	6	17
9.	I feel pain in my throat	48	24	28
10.	I need to clear my throat and cough	11	23	66
	Total Percentage (%)	**46.7**	**19.8**	**33.5**

In figure II, the graph of self assessment is presented. There are three categories of severity as mild, mold and severe. From the graph it is clear that around 50% teachers considered that severity of voice problems faced by them is mild. Similarly, 40 percent consider they have moderate level of problems. Finally, 10% of the teachers consider their problems to be severe. The responses in percentages are given in the figures III representing bar charts.

Figure II: Bar chart representation of self assessment of having a voice problem

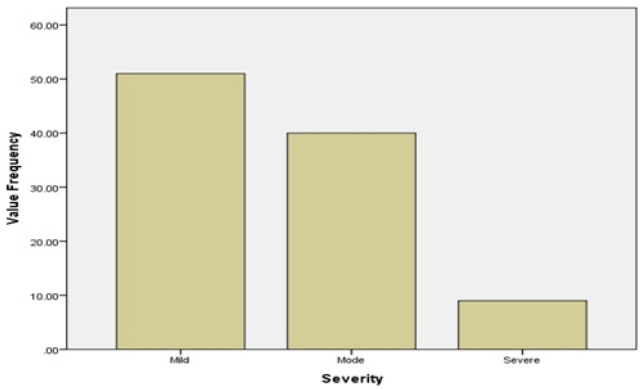
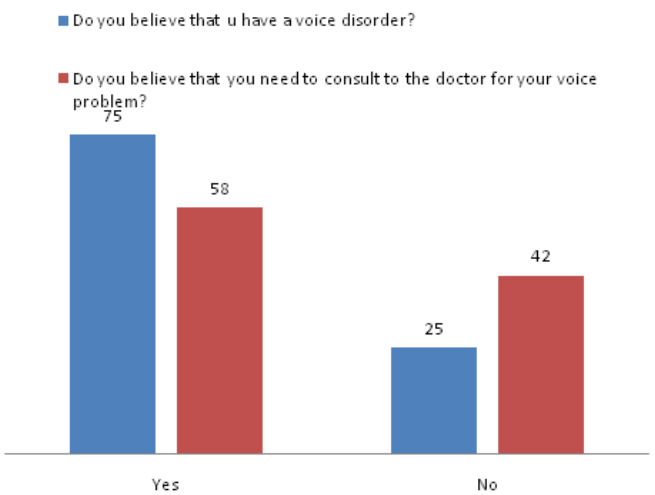


Figure III: Bar Chart for awareness of voice disorders among teachers



The dichotomous variables are used to store the responses for the above questions. 75% of the participants considered that they have voice disorder and 58% consider that they need to consult the doctor.

DISCUSSION

It is widely acknowledged that importance of voice is very important in teaching profession and that teaching can put an immense strain on the voice of teachers. With care the voice can be used to its best advantage, and vocal abuse and strain minimized. elementary school teachers who received weekly lessons on vocal hygiene and voice use during one year of their studies reported significantly fewer vocal symptoms 2 - 4 years after they had begun teaching compared to a group of teachers who did not receive such training [(11)].

The present study was designed to evaluate the awareness of vocal hygiene among the primary school teachers and their treatment seeking behavior. In this study result showed that 64.6% primary school teacher have awareness regarding vocal hygiene. 93% teachers were aware that they have vocal fatigue which affects their performance. 23% teacher did not take sip of water during their lectures but aware of that if they drink water during their lectures their vocal capability enhances. 96% teachers were aware that their pitch is normal or any deviation from normal like high pitch tone or low pitch tone. 28% teachers give rest to their voice but 68% did not give rest their voice, although they know that vocal fatigue can lead to different voice problem. This study also wants to evaluate the treatment seeking behavior among teachers and .result showed that 75% of teacher population was aware that they have voice problem and 25% who have voice problem but do not consider their voice related problem as disorder. But 58% population among the teacher who were aware that they have voice disorder should consult with doctor or speech therapist. 42% teacher did not consult with doctor or speech therapist for their problem. 51% of teachers consider their voice problem as mild and 40% consider their condition at moderate level and 9% think they have severe voice problem. This outcome was in high contrast with the finding of Roy et al [(4)] and Russell et al [(5)] who reported that 14.3% of the American and 32.7% of the Australian teacher consulted a doctor, respectively.

Roy et al [(4)] assumed that teachers were reluctant to take time off from work for medical appointments, or that they fear physician advice to reduce voice use or change occupations general standard practice. Studies show that only a small percentage of teachers who report voice problems seek professional help [(7, 11)]. Similarly with the present research teacher are aware of their vocal problem but do not seek help. In this study, there was no association between awareness regarding vocal hygiene and the prevention of voice complaint. It was seen in the study teachers were aware of vocal hygiene, but did not implement this awareness for prevention of vocal problems. Unfortunately, vocal care has not been taken up in the educational program. Based on this study, we argue for the implementation of a course about the physiology of the voice and vocal care in all teacher programs.

CONCLUSION

It is concluded from the result of the study that teachers were aware of the vocal hygiene but did not follow the protocol for management of voice problem. Similarly teachers are aware of voice problem and some seek medical help, it was due to lack of time for their personal care due to general life stressor like family, socioeconomic status etc. Women compile the largest group of the teachers, which represents a non-negligible portion of the working population.

RECOMMENDATIONS

On the basis of this study following recommendations can be made; i.) Vocal care should be a part of teacher training programs, ii.) Every school has a dispensary and iii.) Teacher should go for follow ups and there is Need to consult to speech language therapist for vocal care.

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A good teacher can Inspire hope, ignite the imagination, a instill a Love of learning.

Brad Henry

Journal of Riphah College of Rehabilitation Sciences

ORIGINAL ARTICLE

Effectiveness of Lumbar Mobilizations in Subjects with Osteoarthritis of Knee

Aftab Ahmed[1], Muhammad Daud[1], Abdul Ghafoor Sajjad[2], Shakeel Ahmed[2], Akhtar Rasul[3]

1. Mehboob School of Physical Therapy, Gandhara University
2. Riphah International University, Islamabad
3. Physical Therapy Department Sargodha Medical College, University of Sargodha

Corresponding Author:
Aftab Ahmed
(aftab_physio@yahoo.com)

ABSTRACT

Background: Osteoarthritis is a disease process involving cartilage destruction (articular), bone thickening (subchondral) and new bone formation. Physiotherapy management includes thermotherapy, Cryotherapy, electrotherapy, therapeutic and manual therapy.

Objective: The objective of the study was to evaluate the effectiveness of Lumbar mobilization along with conventional Physiotherapy in osteoarthritis of Knee patients.

Methodology: It was a Randomized Controlled Trial in which 32 patients diagnosed with osteoarthritis of the knee were randomly assigned into the Experimental Group (Lumbar mobilization with Conventional Physiotherapy) and the Control group (Conventional Physiotherapy). Both groups received three treatment sessions per week, a total of 06 sessions. An assessment was made for each group at the first visit and at end of program using Western Ontario and McMaster Universities Osteoarthritis Index scale, Numeric Pain Rating Scale, Goniometer, Manual Muscle Testing as assessment tools.

Results: Both groups showed significant improvement in Physical Activity Level, Pain, Knee Flexion, Hamstring Length and Quadriceps Strength. Patient with moderate Kellgren & Lawrence grading in both group showed a marked reduction in pain, improvement in disability, Knee Flexion, Hamstring length, and Quadriceps strength ($p > 0.005$). The experimental group showed more improvement but the difference was not statistically significant ($p < 0.005$).

Conclusion: The difference between the two groups was not significant. So, it is recommended that conventional physiotherapy including electrotherapeutic agents, manual therapy and therapeutic exercises is enough for managing of knee Osteoarthritis.

Key Words: Knee Osteoarthritis, Lumbar Spine, Lumber Mobilization

INTRODUCTION

Osteoarthritis (O.A.) is a degenerative disease process involving cartilage destruction more prevalent in female than male [1, 2, 3]. In Asia, prevalence rates of osteoarthritis knee were found to be high in elderly people, especially women [2]. In China, Studies have shown the prevalence of knee osteoarthritis to be 7.50%, 10.9% and 13.6% [4]. In Bangladesh and India it is reported to be 5.78% and 10.20% respectively [5,6] 28% of the urban and 25% of the rural population of Pakistan have knee osteoarthritis [7]. The exact etiology of knee osteoarthritis is unknown; however multiple risk factors including age, gender, accumulation of crystals in joint fluid or cartilage, history of immobilization, history of injury to the joint, obesity, prolonged occupational or sports stress, quadriceps muscle weakness, reduced levels of serum Vitamin C and Vitamin D [8,9].

There are three types of idiopathic knee osteoarthritis: patella femoral, medial compartment and lateral compartment of knee joint [10]. The American College of Rheumatology classification criteria for idiopathic knee osteoarthritis is: knee pain with osteophytes on radiographs along with at least one of the following clinical symptoms such as Age more than 50 years, Morning stiffness lasting for 30 minutes or less and Crepitus on motion [11]. Features of OA knee include loss of ROM, loss of knee articular cartilage leads to mal-alignment of leg with a bow-legged or varus deformity, attacks of acute inflammatory synovitis accompanied by increased effusion and muscle spasm are common[12,13].

Most common investigation procedure used in knee osteoarthritis is the radiograph. However recent advances include Ultrasound, MRI scan, CT scan, Arthroscopy and Synovial fluid biopsy [10]. Pharmacological interventions include paracetamol, corticosteroids, oral and topical NSAID's, opioid

analgesics, glucosamine, intra-articular hyaluronic acid, chondroitin sulphate and Vitamin E supplements. Surgical procedures include joint debridement, osteotomy, compartment arthroplasty and total knee arthroplasty [8]. Physiotherapy management includes thermotherapy, Cryotherapy, electrotherapy. Exercises commonly done are strengthening exercises of quadriceps, isometric exercises of quadriceps, cycling on a static cycle. Manual therapy is recently used to relieve pain and increase joint range of motion in patients with O.A knee.

High-quality evidence shown by 23 systematic reviews on physical therapy interventions for knee osteoarthritis patients was that weight lessening and exercise decrease pain and increase physical function in knee osteoarthritis patients [14]. A randomized clinical trial of manual therapy procedures and supervised clinical exercise versus exercise program at home conducted on 134 patients with osteoarthritis knee indicated that the application of supervised exercises and manual therapy yielded better symptomatic relief [15]. A single blind, controlled trial resulted that the combination of conventional physiotherapy and passive joint mobilization decreased pain but not stairs ascending-descending time among patients with knee osteoarthritis [16]. An experimental study provides evidence that accessory mobilization of knee osteoarthritic joint immediately produces both local and widespread hypoalgesic effects [17]. At present there is gap for study to conduct on Lumbar Mobilization in Knee Osteoarthritis. The current study was designed to study the effectiveness of Lumbar mobilization with Conventional Physical Therapy in patients having knee osteoarthritis

METHODOLOGY

It was Randomized Controlled Trail (RCT) single blind Study. The subjects were selected from Northwest General Hospital & Research Centre and Habib Physiotherapy Complex, Peshawar. By simple random sampling through lottery method32 patients diagnosed with osteoarthritis of the knee assigned into two groups. The outcome assessor was blinded to group allocation, was not involved in providing the interventions. To conceal the outcomes of the randomization, the allocation numbers were put in concealed envelopes. The Experimental Group received Lumbar mobilization with Conventional Physiotherapy (n = 16) and the Control group revived Conventional Physiotherapy (n = 16).

Both groups received three treatment sessions per week, followed for a total of 06 sessions without drop out. Patients suffering from chronic osteoarthritis of knee on radiological findings age ranging from 40-65 years were the inclusion criteria. Patients suffering from inflammatory arthritis, previously undergone lower limb surgery, co existing low back pain or had lower limb deformities were excluded from the study. Structured Questionnaire, WOMAC, NPRS, ROM, Hamstring Length and Quads Strength were the measuring tools. The subjects were randomly divided into two groups (group A & B), using convenient sampling technique and informed consent of each was taken.

Group A (the experimental group) was given lumbar mobilization which includes; CPA glides (10 glides x 3 = 3 sets =1 session) and transverse glides (10 glides x 3 = 3 sets =1 session). It was also given conventional physical therapy which includes; SWD/Hot pack, knee AP/PA glides (10 glides x 3 = 3 sets =1 session), hamstring stretching and quads strengthening. Whereas group B, the control group will receive only conventional treatment.

RESULTS

The results of this study showed that there was no significant difference in the baseline characteristics (age, OA grade, WOMAC, NPRS, Knee ROM, hamstring length and Quadriceps strength) of both the groups. Experimental group proves helpful in improving level of activity up to 11 % measured on WOMAC index, reducing of 3 scale on NPRS, improving knee flexion upto13° measured by goniometer, improving of hamstring length by 11 degrees and improving quads strength measured by manual muscle testing(all were statistically significant). The results are presented in the tables given below ;

Table I. Base Line Characteristics

Control group proves helpful in improving level of activity up to 14 % measured on WOMAC index(statistically significant), reducing of 4 scale on NPRS, improving knee flexion upto10° measured by goniometer, improving of hamstring length by 7 degrees and improving quads strength measured by manual muscle testing(statically significant).

There was marked improvement in all the outcome measures in both the experimental group and control group.

Table 2. Base Line Characteristics

DISCUSSION

The result of this study were supported by the study of Falconer et al, in which there was increment in ROM i.e. 11%, reduction in pain i.e. 33%, and improvement in gait speed by 11% after receiving therapeutic exercises combined with manual therapy[13]). Deyle et al, found that techniques of manual therapy and exercises applied by physical

Experimental Group	N	Mean	P value
WOMEC Before Intervention	16	39.38	0.00
WOMEC After Intervention	16	28.38	
VAS Before Intervention	16	6.56	0.79
VAS After Intervention	16	3.63	
Knee Flexion Before Intervention	16	100.31	0.04
Knee Flexion After Intervention	16	113.13	
Hamstring Length in Degrees Before Intervention	16	54.06	0.01
Hamstring Length in Degrees After Intervention	16	65.00	
Quadriceps Strength Before Intervention	16	3.63	0.04
Quadriceps Strength After Intervention	16	4.13	

therapists for 8 clinical visits produced averaged 56% improvement, stiffness 54%, self-reports of functional ability 54% and pain 60% as measured by the WOMAC [19].

Sterling et al, have reported in their study that joint mobilization produces immediate hypoalgesia in patients with osteoarthritis of knee joint [20]. A RCT showed that six treatment sessions of manual therapy improve flexion of knee and promote activity in people with anterior knee pain [21]. An RCT recommended that a combination of manual physical therapy and supervised exercises yielded functional benefits for patients with knee osteoarthritis and may delay or prevent the need for surgical intervention [22].

Control Group	N	Mean	P value
WOMEC Before Intervention	16	41.50	0.00
WOMEC After Intervention	16	27.6	
VAS Before Intervention	16	6.75	0.279
VAS After Intervention	16	3.75	
Knee Flexion Before Intervention	16	106.88	0.251
Knee Flexion After Intervention	16	116.56	
Hamstring Length in Degrees Before Intervention	16	58.13	0.202
Hamstring Length in Degrees After Intervention	16	65.00	
Quadriceps Strength Before Intervention	16	3.44	0.04
Quadriceps Strength After Intervention	16	4.13	

A RCT on a short term manual therapy knee protocol significantly lessened pain suffered by participants with knee osteoarthritis pain and improved knee function [23]. A double blind, controlled study provided high evidence that accessory mobilization of knee joint having osteoarthritis immediately produces both local and widespread hypoalgesic effects [24]. An RCT on manual therapy procedures and supervised clinical exercise versus home exercise program proved that manual therapy and supervised exercises had greater symptomatic relief [25].

CONCLUSION

This study shows that conventional physiotherapy including electrotherapeutic agents, manual therapy and therapeutic exercises alone is enough for managing of knee Osteoarthritis.

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Journal of Riphah College of Rehabilitation Sciences

ORIGINAL ARTICLE

Prevalence of De-Quervain's Tenosynovitis among Medical Students of Allama Iqbal Medical College

Faiza Taufiq[1], Tahira Batool[2], Salman Bashir[1]

1. Riphah International University, Lahore Campus
2. Allama Iqbal Medical College, Lahore

Corresponding Author:
Faiza Taufiq
(faiza.taufiq@riphah.edu.pk)

ABSTRACT

Background: De Quervain's tenosynovitis is an inflammatory disease due to the chronic overuse of tendons of first dorsal compartment of wrist. Modifications in normal kinematics and anatomical determinants of a tendon in students are common which may be the cause of this disease and little is known about the prevalence of this disease in medical students.

Objective: The purpose of the study was to determine the prevalence of De Quervain's tenosynovitis among medical students.

Methodology: A cross-sectional survey was conducted among undergraduate students studying in Allama Iqbal Medical College Lahore. 137 students were included by non-probability convenience sampling technique.

Results: The results of this study showed that 44(32%) students out of 137 students who filled the questionnaire were experiencing pain in the wrist while 93 (68%) were pain free. It was noted that the disease is more common in female students.

Conclusion: In analysis of medical student's population, the epidemiology of stenosing tenosynovitis of the first extensor compartment had been described. Female gender, work related factors, repeated and sustained bending of wrist in extreme posture were risk factors of developing the disease.

Key Words: Stenosing Tenosynovitis, De Quervain's, Extensor Compartment.

INTRODUCTION

The entrapment tendinitis/tenosynovitis of the abductor pollicis longus and extensor pollicis brevis tendons at the level of dorsal styloid process of radius is known as De Quervain's tenosynovitis. A chronic overuse syndrome of the wrist and hand and a common cumulative movement disorder[(1)] De Quervain's tendinitis is defined as a painful symptom of the wrist; thumb abductor is stenosed tenosynovitis around the radio styloid process this definition was first given by Fritz De Quervain in 1895. The prevalence of this condition is increasing gradually with the new occupational and professional [(2)]. Tendons of the abductor pollicis longus (APL) and the extensor pollicis brevis (EPB) affected in this disease. Movements of the thumb like extension and moving the thumb away from the palm perform with the help of these two muscles [(3)].

Gripping and grasping, moving the wrist in radial and ulnar direction, repetitive or unaccustomed use of the thumb thickened the fibrous tendon sheath due to which inflammation and stenosis of the tendon sheath occur. The causes of De Quervain tenosynovitis in students is overuse of the thumb as in: in writing, short messaging service (SMS, typing, computer users, unnecessary grasping and pinching of objects over a prolonged time.

Activities like stapling, writing, brushing hair, shaving, using eating utensils, or even grasping the steering wheel of vehicle may exacerbate symptoms. Or if a person sent more than 250 text messages on cellular telephone[(4)]. Pain and swelling are the main symptoms. These symptoms usually develop gradually over a period of time. Patient may feel pain as the condition progresses and felt with everyday activities [(4)]. Finkelstein test is used to diagnose de quervains tenosynovitis. In this test the thumb is passively flexed carpometacarpal and meta carpophalangeal joint with the wrist in ulnar deviation. The test is positive if the patient experiences increased pain with the thumb clenched tightly within the fist[(5)].

Differential diagnosis of de quervain's tenosynovitis include Intercarpal instabilities, Scaphoid fracture,

superficial radial neuritis (wartenberg's syndrome), C6 cervical radiculopathy, osteoarthritis of 1st CMC [6]. Immobilization of thumb and wrist with a cockup splint as an initial treatment will reduce pain and swelling. Other treatments options were avoiding repetitive movements, icing, NSAIDs,corticosteroid injections into the tendon sheath and Physical Therapy. Patients who are not responsive to conservative management then the Surgical procedure is an effective treatment [7].Stretching of the muscles of the thenar eminence can relax and lengthen the tight musculature. Strengthening can also give positive results[8].

Ali M, Asim M et al in 2014 check the association of De Quervain's tendinitis with SMS texting in different physical therapy schools of Karachi. The results of this study concluded that the thumb pain and frequent text messaging have a positive association [9]. Eapen C, Kumar B and Bhat AK in 2014 do a clinical ultrasonic evaluation of patients with thumb pain and extensor pollicis longus injury in addition to de quervain and the results of this study showed positive finkelstein test in 40% of cases. The use of mobile phones for text messaging repetitively can damage the extensor pollicis longus of the thumb and the tendons of the first compartment of the wrist joint [10].

John V. Ashurst gives a case report on tenosynovitis caused by texting in May 2010 in which he concluded that the overuse of the thumb musculature is the common cause of de quervain tenosynovitis. The excessive use of mobile phones for texting can aggravate the disease. Naproxen, cockup splints and limitation of texting resulted in complete recovery of patient suffering from this disease [11]. Avci S, Yilmaz C, Sayli U (2002) check the precise etiology of De Quervain's tenosynovitis and concluded that an acute trauma or an extreme, unaccustomed/new exercise. The cumulative micro traumamay be the most common cause[12]. Rossi C, et al. (2005) see the prevalence of De Quervain disease in volleyball players. This study shows that increased training time and consequent micro trauma associated with professional volleyball activity can increase the likelihood of de Quervain disease[13].

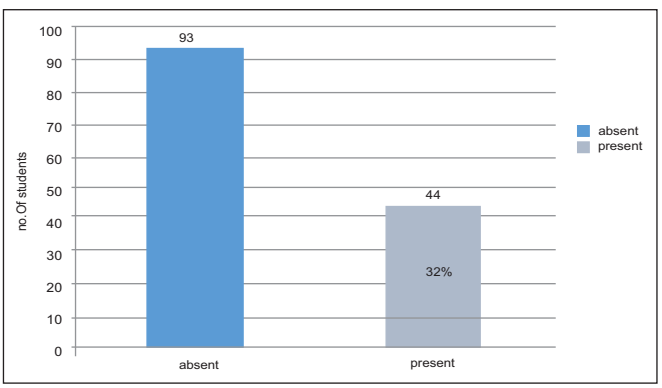
METHODOLOGY

A cross-sectional survey was conducted among undergraduate students studying in Allama Iqbal Medical College Lahore. The study has been completed in 3 months. Undergraduate Medical students from AIMC were selected for the purpose of completion of the study. To estimate a proportion Confidence level = 95%, Acceptable difference = 0.08, Assumed proportion = 0.42 of tenosynovitis[14]. Size of population was 2000 medical students, required sample size was 137. Sample size calculation for single proportion $n= (Z/E)^2 p (1-p)$. Sample was selected through non probability convenience sampling technique. The following inclusion and exclusion criteria have been used. Undergraduate Medical students with 18 to 25 years of age, well-nourished; no signs of physical deformity were included but the students with any systemic disorder and with a history of other associated disorder of wrist were excluded. Questionnaire was developed for: Assessment of patient, goals to be achieved and symptoms as well as the ability to perform certain activities. Following steps were adopted to collect the data. Self-design questionnaire was used to collect data. In addition to the questionnaire, Finkelstein test was used for diagnosis.

RESULTS

The results of this study showed that 44 (32%) students from the total 137 students were experiencing pain in the thumb/wrist and 93 (68%) students were pain free.

Figure I : Presence and absence of De Quervain's tenosynovitis among medical students.



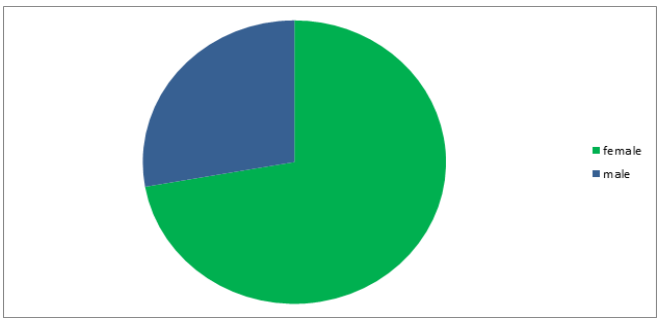
Students giving the history of previous injury were not included in study. Total number of students were 137 (n=137) participated in the study, out of these students females were 109 (80%) and remaining 28 (20%) were males.

Table I : De Quervain's Tenosynovitis in medical students

Gender			De Quervain's tenosynovitis		Total
			Absent	Present	
Female		Count	71	38	109
		within medical students %	52	28	80.0
Male	Total	Count	22	6	28
		within medical students %	16.0	4.0	20.0
		Count	93	44	137
		within medical students %	68.0	32.0	100.0

It was found that the disease is more common in female students than males.

Figure II: Medical students with De Quervain's Tenosynovitis according to gender distributions



Finkelstein test when done on students having restriction with thumb movement 44 students showed positive results. It was noted that as thumb restriction increased progressively more and more people showed positive Finkelsteintest. Out of 137 students 44 were suffering from De Quervain's tenosynovitis.

The frequency will be calculated as follow:

$$\frac{\text{No.of student with De Quervain stenosynovitis}}{\text{No.of students in study}} \times 100 = \frac{44 \times 100}{137} = 32\%$$

Table II: Association of restricted thumb movement with Finkelstein test

Restriction with thumb movement			Frequency	Finkelstein test	
			n=137	positive	nagivtive
Yes		Count	48	42	6
		within medical students %	35	30	5
No	Total	Count	89	2	87
		within medical students%	65	1.5	63.5
		Count	137	44	93
		within medical students %	100	32.0	68.0

So 32% of undergraduate medical students studying in Allama Iqbal medical college without history of previous injury were suffering from De Quervain's tenosynovitis and remaining showed absence of disease.

DISCUSSION

De Quervain stenosing tenosynovitis is common in volleyball players. A study conducted in 2005 on de Quervain's disease in volley ball players the authors studied 45 consecutively enrolled volleyball players (27 professional, 18 non-professionals). 40% volleyball players were suffering from the disease. In this study the total number of medical students (n=137) were participated, female students are 109 (80%) and remaining 28 (20%) were male. In questionnaire each activity of daily living (ADL) item was graded 0, 1, 2 and 3.

If more than 1 item was in grades 1, 2 and 3 finkelstein test was performed to diagnose De Quervain's tenosynovitis. 137 students who filled the questionnaire 44 (32%) students were experiencing pain in the thumb/wrist and another 93 (68%) students were pain free. Finkelstein test when done on students with pain at the base of thumb, positive results were obtained.

As the frequency of usage of mobile phone increases or abnormal usage of thumb musculature as in writing will increase the pain and people showed positive Finkelstein test. New occupational demands like long time work at computer, athlete who follows high resistance training or people who are using hands for support and maximal exertion in

these persons severity of this disease increases. The use of computers and mobile phones among younger peer group for the access and exposure to different types of information and communication has intensely increased over recent years causing such problems.

Due to the overuse of the thumb musculature pain arises that spread over the surface of the radial aspect of the wrist and severity decreases by ulnar deviation of the hand and this study showed that De Quervain tenosynovitis is due to the overuse of thumb musculature. Every participant was examined twice to minimize inter observer variation and questionnaires were filled out carefully by students themselves. Sample size was representative of undergraduate medical students of Allama Iqbal medical college and frequency of De Quervain's tenosynovitis in young medical students was determined by dividing the no. of cases to no. of students under study.

CONCLUSION

This study shows that the disease is frequent in 32% of medical students of Allama Iqbal medical college. Abnormal usage of thumb musculature during hand movements as in prolonged writing, frequent usage of mobile phones for texting and other overuse conditions can increase the likelihood of de Quervain disease. Female gender is more involved in the study .

LIMITATIONS

Following limitations were present in the study; the greater number of female students in this study so the male to female ratio was not equal and as this was a cross sectional study, changes over time cannot be determined.

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ORIGINAL ARTICLE

Effectiveness of Plantar Fasciitis Taping and Calcaneal Taping in Plantar Heel Pain

Bushra Khan[1], Muhammad Salman Bashir[1], Rabiya Noor[1]

1. Riphah International University, Lahore Campus
Corresponding Author:
Rabiya Noor
(rabiya.noor@yahoo.com)

ABSTRACT

Background: Heel pain is one of the most common foot problems especially among older individuals. Mechanical factors play very important role in heel pain. Pain under the heel on weight bearing can cause disability towards movement.

Objective: The objective of the study was to compare the effectiveness of planter facilities taping and calcaneal taping along with stretching and therapeutic ultrasound on heel pain.

Methodology: It was a Quasi experimental study in which data was collected from Canada Orthopedic and Rehabilitation Center. Non Probability convenience sampling technique was used for sample collection and patient were assigned in two groups. Data was collected by using prescribed validated questionnaire, which include Standardized Visual Analogue Scale (VAS) and Foot Function Index Scale (FFI).

Results: The Comparison of percentage of pain decrease post-treatment after evaluation on VAS and FFI in both groups. The decrease of pain in both indicators was significantly higher in group-A (Planter fasciitis tapping group) as compared to group-B (Calcaneal taping group). The decrease of pain in VAS significant at P=0.019 and in FFI at P =0.000 level showing that plantar fasciitis taping is more effective than calcaneal taping.

Conclusion: Plantar fasciitis taping is more effective than Calcaneal taping in planter heel pain.

Key Words: Heel Pain, Activities of Daily Living, Calcaneal Taping

INTRODUCTION

Plantar heel pain or plantar fasciitis can cause considerable pain. The condition is self-limiting and not always very much disabling [1,2]. Many people may bear painful signs and symptoms for many months before going to medical practitioner [3]. Plantar heel pain is characterized as 'first-step' pain, which occurs after a period of non-weight bearing, such as sleeping or resting[4,5].

It is an estimate that one million patients visit every year at medical centers and hospitals outdoor are with intense pain of plantar heel pain. This disease is very much common in people having sedentary life style [6]. 65 years or above older people or aged patients found with plantar heel pain are 7% . Major causes of planter fasciitis are heel bursitis, Tarsal tunnel syndrome and bone cyst[7]. It total makes one quarter of overall foot injuries in runners ten and up to eight percent of all injuries to people take part in sports activities [8]. It is third very most common running injury after iliotibial band friction syndrome and Patellofemoral pain[9].

This condition is considered as multi factorial disorder. Plantar fasciitis or heel pain patients faced many mechanical issues along with variable pain[10]. Poor abnormal forces that place abnormal pressure on already degenerated plantar fascia and every time when patient walks abnormal forces interrupt heeling and leads to more damage of fascia [11]. Excessive weight bearing during exercise is one of the very common factors seen now days in practice. It is also seen that increase in levels of negative arthopathies like Riters disease and spondylitis are also a cause of plantar heel pain or plantar fasciitis.

There are nine studies that are conducted on it and consider as the very strong evidence for it[12]. There is only one research that does not support this factor in this introduction. Obesity as a risk factor for plantar heel pain has significant evidence supporting it. So we can say that the obesity is one of the primary factors that influence and leads to the plantar heel pain or plantar fasciitis. Therefore, more work should be done on it that weather stiffness in the heel pad can be a risk factor of plantar fasciitis[13].

Radiological findings are necessary to rule out that

weather the heel spurs have any association with the plantar fasciitis or plantar heel pain[14]. There are three researches found in favor that increasing in the running miles also increase in the plantar heel pain or plantar fasciitis [15,16]. Increase in the pronation of the foot also leads to increase in the plantar fascia of the foot that is the major cause of the micro degeneration of the fibrous bands of plantar fascia and inflammation. Decrease in the flexibility of the lower limb specially the calf muscle of leg. There are four researches that show the decreased in dorsiflexion of the foot leads to the plantar heel pain or plantar fasciitis [17]. Lower limb tightness is also the risk factor that leads to the plantar heel pain or plantar fasciitis [18]. Messier and Pittaladid a research that patient of plantar fasciitis or heel pain have more leg length discrepancy of 6.4 millimeters and this is the only research that provides the solid evidences regarding the relationship of leg length discrepancy. So according to it leg length discrepancy is considered as a risk factor of plantar fasciitis or heel pain[19].

Powel did a high quality evidence based research on night splints in plantar heel pain or plantar fasciitis.Two groups were selected randomly, participants of one group were provided with night splints along with all conservative managements in the medical centers and second group was provided with no treatment at all. The research went very well but the only point here is that the plantar fasciitis or plantar heel pain is a self limiting disorder that can be settle in twelve months with conservative management. But the results are really good as shown on visual analogue scale so it cannot be denied[20].

Taping is the common way to relieve the symptoms of plantar fasciitis, adds support, reduces stress and relieves pain on the plantar fascia[21].Taping is a cost-efficient treatment choice, especially for people having acute symptoms of plantar fascia problems. The low-dye taping procedure is one of the very commonly used Cryotherapy, laser therapy and calf muscle stretching [18]. Stretching is the deliberate act of lengthening of muscles in the order to increase muscle flexibility and joint range of motion[22]. Dr. Ralph Dyein was a first person who explained a definite accurate procedure of the application of low dye tapes in plantar heel pain or plantar fasciitis. Although, the procedure of low dye technique is very simple and can be taught to the patient and the can apply it very easily in their homes and medical officer can also go and apply this taping procedure during their home visits. If the skin is clean and properly shave with spirit or lotion it assist in adhesion of taping. Taping should apply firmly according to the barrier of skin[23].

METHODOLOGY

Study design is Quasi Experimental trial. Data was collected from Canada Orthopedic and Rehabilitation Centre and Ganj Bakhash Spinal Research and Rehabilitation Hospital.

Study was completed in 3 months after the approval of synopsis. Non probability convenient sampling was used to get the sample. Sample size was calculated by using statistical software (Primer of Biostatistics Version 3.01, McGraw-Hill, 1992), it was determined that a minimum of 17 subjects per Group was sufficient. Both male and female with age group 10-40 years, Subjects complaining of plantar heel pain less than one month of duration, Clinically diagnosed cases of plantar heel pain, Pain located at the heel or plantar surface of the mid-foot with plantar fasciitis, Those who are willing to participate in the study and willing to take treatment for plantar heel pain for successive 7 days were included in study. Subjects with deformed foot, with traumatic injuries, underwent foot surgeries, with deep heel ulcers, with metal implants, Subjects with clinical disorder where the ultrasound therapy is contraindicate, Referred pain, with any neurological disorder were excluded in study. Patient from Canada Orthopedic and Rehabilitation Centre who fulfill inclusion criteria will complete the study after taking history of patient. For the analysis of data SPSS v.16 used and data is presented in form of charts and appropriate graphs as well as standard deviation and mean is also used.

RESULTS

Results showed that FFI scale in plantar faciitis taping group before treatments (Mean± SD) (2.52±0.51) and after treatment reduced to 1.41±0.50. Calcaneal group showed reduction in

FFI scale from Pre to post (2.58±0.50) to (1.94±0.74). VAS scale in plantar faciitis taping group before treatments (Mean ± SD) (7.47±1.23) and after treatment reduced to 2.64±0.70 Calcaneal group showed reduction in FFI scale from Pre to post (7.82±0.95)to(3.70±0.77).

Table I : Frequency Distribution

Groups	Variables	N	Mean	Std. Deviation	P Value
Foot function index scale before treatment	Plantar fasciitis taping	17	2.5294	51450	0.739
	Calcaneal taping	17	2.5882	.50730	0.739
Foot function index scale after treatment	Plantar fasciitis taping	17	1.4118	.50730	0.22
	Calcaneal taping	17	1.9412	.74755	0.22
Viusal analouge scale before treatment	Plantar fasciitis taping	17	7.4706	1.23073	0.356
	Calcaneal taping	17	7.8235	.95101	0.357
Visual analouge scale after treatment	Plantar fasciitis taping	17	2.6471	.70189	0.00
	Palcaneal taping	17	3.7059	.77174	0.00

This table showed that both treatment groups are significant and p value is less than 0.005. Table showed the mean score of VAS in both groups before and after applying the taping. Mean score of planter fasciitis group before applying taping is 7.47 and it decreases to 2.65 while in calcaneal taping group it decreases from 7.62 to 3.71. Table II showed the score of FFI before treatment. All patients were in moderate and severe category of pain.The above table showed that after applying planter fasciitis taping the patients who were in severe category shifted towards mild and moderate category according to FFI but in calcaneal taping group some patients still remain in severe category and showed no significant results.

DISCUSSION

The effectiveness of two different types of taping (plantar fasciitis taping and calcaneal taping) varies considerably between studies according to different studies found in literature. The effectiveness of taping is checked by two standard pain and activity limitation scale named Visual Analogue Pain Scale and Foot Function Index Scale through questionnaire before and after treatment and it was found that according to visual analogue scale pain relived in plantar heel pain patients of group A on which plantar fasciitis taping was applied is 62.9% and group B was 51.5% and according to Foot Function Index Scale pain relieved in patients of plantar heel pain was 45.8% in group A on which plantar fasciitis taping was applied and 29.1% in patients of group B on which calcaneal taping was applied.

Kelley et al demonstrate his results that low dye taping produces small but statistically important results on plantar heel pain patients. Pain decrease was noted on visual analogue scale. The change of 12.3mm on 100mm VAS is greater than 9 to10 mm difference taken as very important clinically[23].

Landorf KB et al reported that there was no significant difference in pain score between groups when different two taping techniques were applied for one week. Improvement in foot pain was noted by Foot Health Status Questionnaire and the main points were activity limitation, stiffness, foot function and general foot health[24].

Researchers found a statistically very important improvement for first-step Pain with different types of taping techniques. It is known that these symptoms that a sharp pain felt when get up from bed first in the morning is a sign of plantar heel pain and for this logic it was added as the criteria of inclusion in the trial. Oppositely, the Foot function index scale Questionnaire is not very sensitive and specific enough to correlate with the improvement found in first step pain as measured separately by using a100mm Visual Analogue Scale[25]. There is non-randomized trial that had previously examined on low-Dye taping for plantar heel pain. A small series of small eight participant's patients reported their beneficial effect from the taping technique applied where as no data was published[26].

There were randomized group trials to check the foot taping technique for Plantar heel pain. A big trial of n 51was reported a 32 mili meters reduce in pain on a 100mm VAS scale on a low dye taping group as compare to blind control group. However the research sample was not collected randomly. The result and discussion of the current trial shows 30mili meters reduce of pain of the low dye taping

group but the control group face in 19 mille meters reduce in pain. The randomized clinical trials shows that 19 mille meters reduce in non randomized clinical trial was because of the confounding variable.

Participant's qualities in this trial were same to the samples in the previous heel pain patient's research. Mostly participants were middle aged women. They were also overweight and spent the most of day time on the foot heel. There are many adverse events happened while doing this trial. The participants were very short-lived and they have mild to moderate pain in their intensity. Five participants remove their tape before the time because of the adverse events. Three participants remove their tape because of allergy reactions the taping technique and two were because of tightness of the taping, all issues were resolved after the removal of taping spontaneously. These types of events can be control by the usage of tape to decrease the tightness and allergy etc.

CONCLUSION

In short term treatment of plantar heel pain it was found that plantar fasciitis taping along with starching and ultrasound is more effective than calcaneal taping .Accordingly, plantar fasciitis taping is recommended for the treatment of plantar heel pain.

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O people! Stay away from getting obese, for it makes one lazy in prayers, corrupts the body, and brings disease(Umar ibn al-Khattab)"Yesterday I was clever, so I wanted to change the world. Today I am wise, so I am changing myself.

Rumi

Journal of Riphah College of Rehabilitation Sciences

Case Report

Effects of Extension, SIJ and Secondary Segment Mobilization in a Chronic Disabling Lumbar Discogenic Pain

Pir Zada Khattak[1], Keramat Ullah Keramat[1], Ikram Ali[1]

1. Helping Hand Institute Of Rehabilitation Sciences Mansehra

Corresponding Author:
Pir Zada Khattak
(pirzadakhattak@yahoo.com)

SUMMARY

Forty six years old female was assessed in physiotherapy OPD of Helping hand institute of rehabilitation Sciences Mansehra complaining of back pain. She had history of the same for 15 years. Her back pain aggravated 4 years ago after lifting a heavy weight. At that time she was treated by orthopedic surgeon through lumbar traction and pain medication. The severe pain resolved for more than two years. Her back pain recurred 3 months ago in an excruciating manner and disabling form. No remedy was relieving her pain. Key finding during objective examination were: Decrease SLR Right more than left; decrease range of motion of lumbar spine on all planes; severe pain on passive inter vertebral movement; decrease myotomal strength within the distribution of L_5 and decrease mobility. Findings on MRI were: grade 2 spondylolisthesis, multiple level disc herniation and bulges.

Out of the box and novel Physiotherapy interventions such as specific extension maneuver at L_5S_1 level, Mobilization of SIJ and segment above L_5were useful in reduction of pain and restoration of her mobility. She received 24 physiotherapy sessions extended over 2 month's duration and became asymptomatic. The case was initially seen in April 2014 and last seen was June 2015.

CASE PRESENTATION

A female patient age 46 presented in the physical therapy OPD of Helping Hand Institute of Rehabilitation Sciences with complain of severe low back pain radiating to her lower limbs for the previous 3 months.

She reported no history of trauma but continuous sitting for 15 days 3 months ago. She further reported that had a history of back pain for 15 years and 4 years ago her pain got worst after lifting a heavy weight. She was than treated by the orthopaedic surgeon with continuous lumber traction. Her current pain is the worst ever and has seen various orthopaedic and neurosurgeons during the last 3 months but no joy. She was on pain medication such as diclofenac Sodium, piroxicam, Mecobalamin, and tizanidine.

The pain score on numeric rating scale was 0/10 indicating worst pain imaginable. The score on Roland Morris disability questionnaire was 23/24, indicating severe disability due to her back pain and needed assistance of two people in her functional activities and activities of daily living.

She was examined thoroughly in Physical therapy Department. The left shoulder was elevated than the right shoulder. She was moderately overweight (BMI=28) and had left sided scoliosis in her thoracic spine. Forward flexion was limited and she was just able to touch her tibial tuberosity with fingers during flexion. Her left side flexion was 15^0 and right side flexion 30^0. She was unable to stand on left leg toes. Active SLR at left side was less than 20 degree and on right side it was less than 40 degree. The passive SLR was minimally pain free with flex knee. The iliopsoas and quadriceps of left side were in grade 5/5 while the hamstrings, foot plantar flexors, ankle dorsiflexors, invertors and evertors were in grade 4/5. All the muscles of right leg were in grade 5/5.

The reflexes on both the side were hard to elicit owing to patient pain and body weight. On performing passive intervertebral movements there was stiffness at L_2-L_3 levels and passive accessory movements of the spine were painful from $L_1$to L_5 levels. The internal and external rotation and flexion of the hip were pain free. The FABER test was positive for left SIJ .The sustain pressure above the level of the disc herniation was easing the pain and improving her extension ROM.

INVESTIGATION

The radiological findings revealed that grade 2 Spondylolisthesis and disc herniation at L_5S_1 level causing moderate level of canal stenosis and severe bilateral intervertebral foramen stenosis and compression on the exiting nerve roots.

TREATMENTS

Physiotherapy treatment was started on the first day.The interventions included specific mobilization of the lumbar spine from L_1 to L_5 level in side lying position and with the spine in rotation. The specific mobilization was as follows. Mild intensity forces were directly applied over the spinous process in opposite direction in such way as to maximize rotation during the first treatment session. The lower spinous process was stabilized during the mobilization through fingers while the upper spinous process was forced to bring the torsional effect in their natural direction of moment.

Indifferent maneuver was also administered during the prone lying position. An antero-posterior force was applied through the pisiform of one hand of therapist reinforced by the other hand at L_5S_1 level while the patient was kept in a relatively extended position of the spine. The aim of this maneuver was to approximate the posterior margins of the vertebral bodies and distract the anterior margins so that to developed a negative pressure within the region of nucleus pulposus. Positive outcomes of this maneuver had been claimed before [(1)]. Five to ten repetitions were administered with sustained pressure of around 30 second during each push. The applied force was kept within the level of patient's tolerance of pain.

Sacroiliac joint of the left side was mobilized through assistance of another trained person. The patient was positioned on her right side. The therapist positioned one hand at the anterior superior iliac spine and the other on the left ischial tuberosity region. The assistant was asked to bring the left extended leg in flexion and the therapist tried to bring movement in a clockwise around the hip joint (as fulcrum) and rotation force through ASIS and ischial tuberosity. The maneuver was reversed during the passive flexion. Several repetitions were administered. Self (active) mobilization of the sacroiliac joint were taught to the patient and advised to perform 15 times 3-4 times a day.

Other routine interventions were inclusive of treatment with TENS machine and superficial heat. Her general mobility was addressed as well during the intervention session. She practiced mobilization with Zimmer frame and assistance during the initial two weeks of treatment.

The patient was advised regarding certain posture. She was told to avoid flexed and low sitting. She was further advised to lie on her back with maximum support below the L_5S_1 level and don't flex her back for weight lifting. She was also told to avoid long sitting and long journey for 3 months.

OUTCOMES

Pharmacological interventions were relieving her pain temporarily. Symptoms were recurring and the resolution was not sustainable before the physiotherapy interventions. The outcomes of the first session were satisfactory and elevated patient trust. The patient felt improvement in her pain up to 1 cm on NRS after 1st session. The improvement in pain continued during the following sessions and was recorded as 15 %(1.5 cm) in two sessions, 25%(2.5cm) in three sessions, 45% in 9 sessions, 50% in 10 sessions,90% in 20 sessions and 100% in 24 sessions .The score on Roland Morris disability questionnaire was 0/24 at the time of discharge as compare to the initial 23/24. The SLR improved more than 60 degree bilaterally, FABER for SIJ became negative after two weeks of treatment, forward and side flexions were in functional limits and there were no sensory and motor deficits at the time of discharge. However, ankle and patellar reflexes could not be elicited. She was reviewed after 3 months and 1 year with no report of recurrence.

Review MRI after 2 months of physical therapy confirmed the improvement. The disc herniation at L_5S_1 level markedly regressed with restoration of the lumber curve and no compression at the root level.

Improvement in anterolisthesis was also noted. Improvement in mobility was noted subsequent to the improvement of pain and she became independent in all activities of daily living.

DISCUSSION

Successful physiotherapy interventions in relation to disc prolapse reduction have been reported in the literature. Extension of the spine is emphasized among these intervention and benefits demonstrated [1, 2]. Conversely, repeated loading of the spine have been demonstrated as the cause of disc prolapsed [2, 3]. Major credit of success of disc regression in this case may be attributed to this extension maneuver. However, the maneuver in this case was modified so that to ensure the stability at L_5S_1 level, lumbar spine in extension posture and to produce localized extension at this level. It is believed that an extension movement causes distraction anteriorly and approximation posteriorly; thereby creating negative pressure and a push effect on the disc [1].

Bed rest for more than 2 days is not recommended [2, 3, 4] because of its association with decondition and synovial joint stiffness which becomes secondary sources of pain [5, 6] and hinder recovery from the primary source of pain. Since the patient in this report was immobile for nearly 3 months' time, regardless of the objective finding, multiple level spinal mobility was deemed essential. Therefore segments above the level of L_5 and SIJ were mobilized along with general mobility practice.

Interventions were modified, added or withdrawn when needed based on the patient feedback and objective finding. Meticulous re-assessment during the treatment session is of utmost importance and guides the selection /withdrawal of intervention and its parameter.

Patient education with respect to back is highly recommended [7] and significant time was spent to educate the patient in relation to her condition.

Spontaneous regressions of herniated discs in lumbar spine region are reported [8,10] and Majority of these regressions attributed to conservative treatment. It is further explored that the larger and sequestrated discs have higher probability of regression than protruded discs [9].Some radiological study [11] on the topic of spontaneous regression reveal that the patients receiving no treatment but physiotherapy.

Keeping the favorable outcome of this report and others [1] in view, protocols and structure studies are needed for the management of disc herniation.

CONCLUSION

The maneuvers used for the treatment of lumbar discogenic pain in this report provide preliminary evidence of their effectiveness in the treatment of lumber disc herniation and the chronic changes associated with it. Studies of higher quality are needed to evaluate the effects of these maneuvers.

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