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Effects of matrix rhythm therapy in patients with myofascial trigger points

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Abstract
Introduction: Matrix rhythm therapy is a cell biological therapy approach developed at the University of Erlangen, Germany. Low coherent magneto mechanical waves are applied to synchronize the regeneration and function of the cell. The purpose of this clinical trial was to investigate the effects of Matrix rhythm therapy in patients with myofascial trigger points.
Materials and Methods: A sample of 21 patients (17 Women, 4 Men) with upper trapezius myofascial trigger points received 9 sessions of matrix rhythm therapy. Outcome measures were pain and function which were measured by Constant - Murleyscore. Data was collected at baseline and after 9 sessions of treatment intervention.
Results: There was significant difference between the pretest and posttest scores. 20 out of 21 patients had zero pain after 9 sessions of matrix. All the patients showed improvement in function and pain intensity.
Conclusion: The results of this study showed that Matrix rhythm therapy is effective at improving symptoms and deactivating the myofascial trigger points.

Keywords: Matrixrhythm therapy, Myofascial trigger points, Cell biological therapy.

Introduction
A Myofascial trigger point is defined as a hyper irritable and hypersensitive spot in a taut band of skeletal muscle fibers.[1] They are also described as tender nodes of degenerated muscle tissue that can cause local and radiating pain.[2] In addition to sensory symptoms like pain, trigger points can cause motor and autonomic symptoms.[1'2] Trigger points can occur in ligaments, tendons, joint capsule, skin, and periosteum other than muscle.[1,2]

Myofascial trigger points are categorized into active and latent. Active trigger points are spontaneously painful and symptomatic, while the latent trigger points are painful when compressed but otherwise asymptomatic.[1,2] An active trigger point can prevent full lengthening of the muscle, weakens the muscle and mediates a local twitch response of muscle fibers when stimulated.[1,2]

A latent trigger point which is painful only when compressed may also have all the other clinical characteristics of an active trigger point like preventing full lengthening, weakening the muscle, autonomic dysfunction and local twitch response.[1,2]

Trigger points are developed after muscle over use such as repetitive or sustained low-level muscle contractions, maximal or submaximal concentric contractions and eccentric muscle contractions.[1-5] Energy crisis (ATP) in the muscles causes the formation of trigger point. ATP is required for the contraction as well as relaxation of the muscle. During relaxation phase without ATP, the cross bridge formed between actin and myosin cannot be detached, so the sarcomere is in contracted stage. The whole process leads to the formation of taught band and trigger point.[1-5] Other causes of trigger point formation were direct trauma, joint dysfunction, after surgery, neurological influences and poor body mechanics.[1-5] There are many non-invasive methods like stretching, laser therapy, ultrasound and invasive methods like dry needling, trigger point injection, acupuncture to manage myofascial trigger points.

A new therapeutic and clinical modality matrix rhythm therapy was developed by Dr. Ulrich Georg Randoll is based on research carried out in 1989-1997 at the department of oral and maxillofacial surgery and trauma surgery of Erlangen University. Matrix is a cell biological therapy which activates and rebalances specific physiological vibrations of skeletal muscle and nervous system.[6] Matrix reactivates the cell metabolism and normalizes the physiological process by depth-effective rhythmical phase synchronous magneto mechanical oscillations.[6] The frequency of matrix is modulated between 8 and 12 Hz. In this process the cells are stimulated and the entire tissue is rhythmically resynchronized.[6] Matrix basically works and improves the tissue extensibility, and also the circulation. The contracted areas of the musculature will be inductively relaxed by increased circulation which increases oxygenated blood followed by ATP synthesis and dissolution of the tension.[6] Matrix Rhythm Therapy was extensively used in Orthopaedic, Neurological and vascular conditions.

We found no previous study on the effects of matrix rhythm therapy in patients with myofascial trigger points. The aim of the study was to find the effects of matrix rhythm therapy on pain and functional components of trigger points in upper trapezius muscle.

Materials and Methods
Twenty one participants were selected who had pain and active trigger points for the past six months. Patients with pain less than six months and other clinical conditions were excluded. Patients with the following conditions were also not included in the study. Thoracic outlet syndrome, rheumatological disorders, neurological disorders which could result in muscle weakness in the shoulder, rotator cuff

tears. Evaluation of trigger point was by palpating a hypersensitive nodule in the upper trapezius muscle which elicited pain.

Outcome measures were pain and function. Both were measured using Constant – Murley shoulder outcome score. The Constant-Murley scale is a 100 point scale where higher scores indicate better function. It is composed of four parameters. They are pain (15 points), ADL (20), ROM without pain (40) and strength (25). All the parameters were measured in a standardized way.[7] Every patient received treatment at the clinic, three times a week for three consecutive weeks totaling 9 sessions. Assessments were performed at baseline and three weeks after the treatment by the same physiotherapist.

Intervention

Matrix rhythm therapy was applied by a physiotherapist who is trained and certified in the matrix rhythm therapy programme. Matrix was applied for sixty minutes along the course of the muscle fibers of upper trapezius from proximal to distal and distal to proximal with patient sitting in relaxed position.

Results

Twenty one patients (17 women, 4 men) with mean age of 32.3 years were included in the study. We used graph pad instant V3.0 for data analysis. Kolmogorov – smirnov test was used to assess the distribution of data and our data were found to be normally distributed. Paired t test was used to assess the results. Pretest and post test scores of the Constant-Murley scale were assessed and the two tailed p value < 0.0001 were considered significant.

Discussion and Conclusion

This study evaluated the effectiveness of matrix rhythm therapy in patients with trigger points. Our findings indicated a significant improvement in pain intensity and function. After 9 sessions of matrix rhythm therapy all patients showed clinical and statistical improvements. 20 out of 21 patients had zero pain after 9 sessions of matrix. According to Dr. Randoll, Matrix reactivates the cell metabolism and the physiological process is normalized by phase synchronous magneto mechanical oscillations. Based on the principle of resonance, matrix oscillates the cells between 8-12 Hz. The deactivation of trigger points may be attributed to biochemical and metabolic changes after applying matrix around the trigger point.

Previous studies found that there was a significant difference in the levels of biochemicals like Bradykinins (BK), Prostaglandins (PG), Calcitonin gene-related peptide (CGRP), and Substance P (SP) between myofascial trigger points and healthy muscle tissue.[8] These substances increase local blood flow and pressure, which activates the mechanoreceptors and nociceptors leading to increased local tenderness and pain. pH levels were also less in the myofascial trigger points than healthy muscle tissue.[8] Acidic pH levels in the muscle tissue have been associated with pain and lowered nociceptor threshold sensitivity.[9,10]

An earlier study found that matrix increases the blood circulation by 35%.[11] After the application of matrix as the blood circulation increases, the metabolic by products and other biochemicals are disposed, thus, the pH gets normalized and the metabolism of the cells are restored. As a result, ATP is produced which is required for the actin myosin detachment during the relaxation phase of the muscle. Thus the trigger point gets deactivated and normal function of the muscle is restored.

Biological scaffold materials derived from extracellular matrix from living tissues was successfully used in tissue regenerative medicine applications.[12] Matrix rhythm therapy generates asymmetrical pressure distribution and sets the extra cellular matrix into motion, thus, the exchange of metabolites and nutrients is strengthened at the cellular level.

Matrix can be suggested as an alternative method for treating trigger points. There are limited numbers of studies with low level of evidence about the effects of matrix rhythmous therapy. Randoll and Hennig applied MRT in 65 patients with low back pain over six sessions within a week, and they reported a significant improvement in pain.[13] Jager et al. have assessed the effect of matrix on pain, sleep and ROM of the spine in patients with low back pain. They compared matrix with other conservative therapies like electrotherapy and exercise. Results of their study, involving 80 patients, indicate that matrix is more effective in reducing pain and increasing flexibility.[14] In our study matrix application decreased pain and restored normal muscle function. Further studies are necessary to find the biochemical changes in the muscle before and after application of matrix rhythm therapy. We also recommend comparing matrix with other treatment modalities.

Study Limitations

The study population and the absence of control group is the main limitation of the study to assess the placebo effects. The strength component of the scale was not measured using a dynamometer. There was no follow up to find the long-term effects of matrix.

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The effect of Garba dance of Gujarat on fitness components of young adult females

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Abstract
Introduction: Physical fitness has been defined as the individuals' ability to meet the demands of a specific physical activity. Dance is recognized as a mode of physical activity, which requires physical fitness activities like sport and exercise. Garba is a folk dance of Gujarat, India, composed of multiple levels of speed, co-ordination and full body movements with fast steps synchronized with the rhythm of music and lyrics.

Aims and Objective: To measure the effects of Garba dance on physical fitness, cardiovascular fitness, and emotional status in women.

Materials and Methods: The study design was non-experimental. 25 female college students, age range 19-25 years, gave voluntary consent. All participants performed Garba, 3 times per week for 10 weeks, for total 30 sessions. Each session lasted for about 30 minutes. Sessions were composed of the following activities: 5 minutes warm up, 20 minutes Garba and 5 minutes cool down. Variables measured were flexibility, BMI, skin fold thickness, cardio-vascular fitness and emotional status of participants. All statistical analyses were performed using the SPSS version 20.0 (IBM, Armonk, NY, USA) for Windows.

Results: Post training, significant changes ($p<0.05$) were observed only for skin fold thickness, sit to stand, and sit and reach test have significant changes with a P value < 0.05.

Conclusion: A 10-week Garba programme improved physical fitness, cardiovascular fitness, lower body flexibility lower body strength as well as exercise tolerance.

Keywords: Folk dance of Gujarat – Garba, Physical fitness, Cardiovascular fitness, Emotional status.

Introduction
Physical fitness may be defined as "the individual's ability to the demands of a specific physical task." and it includes components such as cardiovascular endurance, musculoskeletal strength and endurance, power, speed, flexibility, agility, balance, reaction time, and body composition. In dance, the performer has to work under anaerobic and aerobic conditions, so it requires joint mobility, muscle flexibility and strength, and body composition. The quality of the dancer's technique and the artistic performance depends on their physical fitness components and motor abilities.[1-6]

Dance is recognized as a type of physical activity, which produces the same positive health effects as traditional activities like sports and physical exercise. Dance-based physical activities combine social, physical, and cognitive stimulation. Music initiates delight through the interaction with dance partners and increases positive beliefs toward the exercise. When used as therapy, dance provides innovative, creative, and useful ways to help individuals to improve their fitness through a comprehensive focus on the mind and body and integrating both cognitive and social aspects. The American Dance Therapy Association defines dance therapy as 'the psycho therapeutic use of movement to further the emotional, cognitive, physical, and social integration of the individual'.[6,7]

Folk dance is local dance which was initially developed among the peasantry and maintained by them in a fluid tradition without the aid of the professional dancer, teacher or artist. Folk-dance is primarily for the sheer pleasure of the performers and not for the entertainment of the public. The Garba is performed in a circle which moves in an anticlockwise direction, when it is interpreted as an 'upward ascending' and while the coming down or descent is clockwise. The beautiful dance patterns, in which women move and revolve in the circle smartly and lithely, gradually increasing the tempo to reach the climax of the dance. They dance with ease, grace, and vior, precisely keeping and co-coordinating time, tempo, harmony and rhythm by their exact Tali (clap) strike, feet thumping and physical movements, actions, and gesture. Clever quick, sure and easy steps and an agile elaborate balanced half turn and flexible movements following the Tali (clap), are really beautiful when the Garba enters into fast or double rhythmic time, and the tempo rises to its zenith.[8,9]

We hypothesized that the body twirls, arm movements and fast footsteps synchronized to a speedy rhythm performed in Garba dance can provide an exercise stimulus to the body which is comparable to aerobic exercise. Based on this, we aimed to measure the effects of Garba dance on physical fitness, cardiovascular fitness and emotional status in young adult females.

Materials and Methods
Participants
The present study is an observational study conducted on 25 female college students as participants who had given written informed consent to participate. The inclusion criteria were only female non-professional dancers aged 19–25 years. Exclusion criteria were males, professional dancers, musculoskeletal injury of the upper limb or lower

limb, any neurological or medical problem, and any surgical condition.

Outcome Measures

Besides anthropometric measures i.e. height, weight and BMI; the following outcome measures were used, Skin fold thickness for body fat percentage,[10,11] Blood pressure, heart rate and VO_2 max for cardio vascular fitness,[12,13] Six minute walk test[14,15] and Borg rating of perceived exertion scale for functional capacity evaluation & exercise tolerance,[16,17] Sit and reach test for flexibility,[18] Sit to stand test for lower limb strength[19] and Positive and Negative Affect Schedule (PANAS) score for emotional status.[20]

Procedure

Data on anthropometric and fitness parameters were obtained using the standard procedure. Data were collected three times at 0 week (i.e. before intervention) and after 4 weeks and 10 weeks of Garba sessions. After measuring height and weight, BMI was calculated. Skin fold thickness was measured by caliper at waist level. After measuring the blood pressure and heart rate at rest, participants were instructed to perform the 6-minute walk test. At the end of the test, exertion was measured with Borg rating of exertion scale (15-point scale ranging from 6-20, with 6 as very, very light and 20 as very, very hard). Blood pressure (BPmax) and heart rate (HRmax) were measured. . VO_2 max was calculated using a formula VO_2 max = 15.3 x (maximum HR - resting HR). VO_2 max is an important determinant of cardiovascular fitness. Sit and reach test was performed on customized sit and reach box and distance was measured for flexibility of lower back and hamstring. Sit to stand test was also performed to determine the endurance of lower extremities as well as general fitness.

All the participants received 30 Garba sessions, 3 times per week for 10 weeks. Each session lasted for about 30 minutes. Sessions were composed of the following activities: 5 minutes of warm up, 20 minutes of Garba, 5 minutes of cool down. The Garba steps included basic forward, backward and rotational steps which involved shifting the body weight, stretching the arms in every direction, lifting the legs and flexing the feet. Institutional permission was taken for this study.

Statistical Analysis

Descriptive statistics were done and numerical variables presented as mean ± SD for all 25 participants. Difference between the levels of measurements (before Garba, after 4 weeks and after 10 weeks of Garba sessions) for all the outcome measures were tested using repeated measure analysis of variance test. The statistical analyses were performed using SPSS-20 software, Armonk, New York. The P-value <0.05 was considered to be statistically significant.

Results

The present study was conducted on 25 female college students with mean age 20.76±0.92 years. The demographic data and outcome measures statistics are presented in Table 1 & Table 2.

Table 1: Demographic data of participants

Characteristics of participants	Mean ±SD
Age (years)	20.76±0.92
Height (cm)	160.33±4.58
Weight (Kg)	54.70±10.21
BMI (Kg/m^2)	21.28± 4.31

Discussion

The present study aimed to measure the effects of Guajarati folk dance – Garba on physical fitness, cardiovascular fitness and emotional status. In the study, no significant changes in BMI was calculated before and after the entire duration of dance. This may be due to the short duration of the Garba dance intervention and/or its application in isolation, because the production of changes in body composition often requires the implementation of multidisciplinary programs involving not only physical exercise, but also changes in lifestyle, nutrition, and occasionally the application of cognitive-behavioral therapy with a pharmacologic approach. Kostrzewa-Nowak et al[21] stated that the 12-week-long fitness training program of two alternating styles (low and high impact) has a favorable effect on overweight young ladies. Sasa Pantelic et al[22] concluded that aerobic dance decreases subcutaneous fatty tissue. Likewise in our study, a significant difference in the skin fold measurement taken at waist level after 10 weeks of Garba sessions suggests that Garba is effective in reducing abdominal visceral fat. A significant change in body fat was seen after applying low impact aerobic dance sessions.[23]

Previous studies have indicated increased flexibility after Eight weeks of aerobics dance had a significant effect on joints [knee, hip, and trunk] flexibility of the patients with osteoarthritis.[24] Similarly, in our study significant difference in sit and reach test and sit to stand test suggests that Garba has a significant effect on increasing lower limb and trunk flexibility and strength. The Garba dance has a significant effect on improving oxygen consumption capacity (VO_2 max). A study by Nandhini.[25] has also found the same result on the effect of aerobic dance training on the VO_2 max uptake of college women. Garba dance showed a significant effect on resting systolic BP and on diastolic blood pressure at rest and at the maximal excursion. The effect of Garba dance on Borg rating of perceived exertion scale suggested that there was reduced discomfort in breathing as well as improved functional capacity and tolerance among the participants at the end of 10 weeks of Garba sessions. A study conducted by Pacheco et al. looking into the effects of Colombian Caribbean folk dances found increased physical fitness and health related Quality of life in older women.[27] Similarly another study by Lucia Cugusi, et al., on the Sardinian folk dance 'Ballu Sardu'[28] and one more study conducted by Maria Serrano-Guzman et al. showed that Spanish dance therapy was effective to improve mobility, balance, and levels of physical activity

and fitness in women, which is similar to findings of our study".[29]

Table 2: ANOVA results for the outcome measures

Outcome Measures	Level of Measurements	Mean±SD	F Value	Significance	Partial Eta Squared
BMI	0 week	21.33±4.44	0.881	0.431	0.085
	4 week	21.49±4.28			
	10 week	21.75±4.08			
Sit and reach (cm)	0 week	46.02±7.91	5.614	0.012*	0.371
	4 week	47.29±8.13			
	10 week	48.50±7.85			
Sit to stand (time in seconds)	0 week	17.67±2.08	4.816	0.020*	0.336
	4 week	18.09±2.66			
	10 week	19.14±3.58			
Positive Affect Score of PANAS Scale	0 week	31.90±5.15	3.114	0.068	0.247
	4 week	33.19±5.02			
	10 week	34.66±4.67			
Negative Affect Score of PANAS Scale	0 week	19.48±7.63	0.003	0.997	0.000
	4 week	19.38±7.66			
	10 week	19.42±7.12			
Heart rate (rest) (beats/minute)	0 week	90.25±12.61	4.423	0.027*	0.330
	4 week	79.25±13.57			
	10 week	81.70±7.49			
Heart rate (max) (beats/minute)	0 week	124.29±16.68	14.855	0.000*	0.610
	4 week	104.42±15.13			
	10 week	102.42±15.41			
VO_2 max (litres)	0 week	21.56±3.03	3.408	0.056	0.275
	4 week	20.29±2.32			
	10 week	19.22±2.29			
Blood pressure (rest) systolic (mm Hg)	0 week	106.24±13.56	6.878	0.006*	0.420
	4 week	115.61±7.31			
	10 week	115.95±7.80			
Blood pressure (max) systolic (mm Hg)	0 week	127.48±14.80	0.030	0.971	0.003
	4 week	127.04±10.95			
	10 week	127.57±9.39			
Blood pressure (rest) diastolic (mm Hg)	0 week	63.29±10.76	7.901	0.003*	0.454
	4 week	71.19±6.42			
	10 week	70.09±5.34			
Blood pressure (max) diastolic (mm Hg)	0 week	67.62±6.71	7.377	0.004*	0.437
	4 week	72.85±7.10			
	10 week	72.66±5.21			
Rate of Perceived Exertion	0 week	3.00±0.894	4.878	0.020*	0.339
	4 week	2.61±0.86			
	10 week	2.47±0.74			

* P value is < 0.05

The present study has some limitations also. First, the small sample size could be affecting the findings of the study with low statistical power. Moreover, a convenience sample was used, and those who volunteered may have been different from those who did not or could not participate. As an observational study of short duration, long-term effects were not assessed, but results suggest promise. To build on this promise, further studies including males, longer duration study, and larger samples are needed. According to our knowledge, this is one of the few studies exploring the effects of Garba dance on physical fitness and cardiovascular fitness and emotional status.

Conclusion

A folk dance of Gujarat – Garba, is can cause improvements in physical fitness and cardiovascular fitness in young women in a community setting. A 10-week intervention improved physical fitness and cardiovascular fitness, lower body flexibility, and lower body endurance, as

well as exercise tolerance (rate of perceived exertion). However, Garba dance had no effects on the emotional status of the participants.

Conflict of Interest: None.

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Psychometric properties of Gujarati version of Fatigue Severity Scale (FSS)

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Abstract
Introduction: Fatigue is a complex symptom and difficult to study because of its multiple types and causes. Fatigue Severity Scale (FSS) is frequently used for measuring fatigue and consists of a nine-item questionnaire. It has high internal consistency (0.81–0.94) and satisfactory test–retest reliability (ICC:0.82). For meaningful comparison to be carried out between various patient groups, it is necessary to investigate the psychometric properties of the FSS in the different population in their vernacular language. This study aimed to translate FSS into Gujarati language and determine its validity and reliability.
Participants: Eight experts, consisting of neurologists, physicians, and physiotherapists were included.15 subjects between 25-60 years, having conditions like parkinsonism (n=5), post-polio syndrome (n=10) having primary symptoms of fatigue were included.
Materials and Methods: In this cross sectional survey, translation of FSS was done into Gujarati as per guidelines of World health Organization. Face, content and concurrent validity were determined. Internal consistency and test-retest reliability was also examined across two raters. Level of significance was kept at 5%.
Results: Experts had experience of 8.56 $\pm$ 2.39 years. Face and content validity was established by review of the Gujarati FSS by experts (n=8), with mutual consensus. Patients included nine females and six males, between 45.6 $\pm$ 5.3 years. Concurrent validity was assessed using Pearson's correlation, with the coefficient being 0.81(95% CI: 0.75 to 0.84).
Conclusion: Gujarati version of FSS is comparable with the original English instrument in terms of validity and reliability. It is psychometrically feasible and can be used in Gujarati population to assess fatigue in various clinical conditions.

Keywords: Fatigue severity scale, Translation, Validity, Reliability.

Introduction
Fatigue is a complex symptom that is difficult to study because of its multiple types and causes. However, it is a prominent disabling symptom in a variety of medical and neurologic disorders. It can be assessed in a variety of ways, in terms of duration-acute and prolonged and in terms of determined force output. Subjective measures of assessing fatigue consist of questionnaires, diaries or interviews, whereas objective tools focus on physiological processes or performance, such as reaction time or the number of errors.[1]Based on various algorithms studied previously, self-reported measures have been proven to be equally efficacious to field tests to determine force generation. Fatigue is defined as the subjective lack of physical or mental energy, and is among the most debilitating symptoms of post-polio syndrome (PPS). Approximately 66–89% of patients with PPS perceive symptoms of increased fatigue that may lead to decreased physical and social functioning.[2] Also, majority of PPS patients identify fatigue as their most troubling symptom and is typically the earliest symptom, which worsens over time, and often leads to severe incapacitation.

Fatigue assessment typically relies on subjective self-report questionnaires, since it is a subjective experience. A frequently used inventory for the evaluation of fatigue is the Fatigue Severity Scale (FSS) originally developed by Krupp et al. for the use in patients with Systemic Lupus Erythematosus and Multiple Sclerosis.[3] The three most commonly used scales to assess fatigue in persons with PPS include the Fatigue Severity Scale (FSS), the Fatigue Impact Scale (FIS), and the Multidimensional Fatigue Inventory (MFI-20). The validity and reliability of FSS, FIS, and MFI-20 have been studied in persons with PPS, and FSS may be the preferred scale since it has fewer items and therefore is less time consuming.[4]

Extensive research has been done on FSS previously across various populations of PPS, in various countries. However, a major shortcoming is the lack of local linguistic versions which is recommended as it could allow researchers to more accurately measure changes in fatigue intensity occurring over time. In India, the only previous study to assess FSS in Parkinson's patients was conducted using a translated FSS (FSS‑Ind) into (Hindi/Punjabi).[5] Hence the purpose of the study was to translate FSS into Gujarati language, and determine its validity and reliability across some fatigue associated neurological conditions.

Materials and Methods
This study was conducted at the Physiotherapy department of SBB College of Physiotherapy, VS General Hospital, Ahmedabad. Study protocol was approved by Institutional Review board. Steps for translation recommended by WHO were employed for translating FSS, as described in figure 1.[6] Initially forward translation was done of the 9 items of the FSS from English into Gujarati. Thereafter, a bilingual physiotherapist who was blinded with respect to the original version translated it backwards into English. Finally, the Gujarati version was adapted according to this procedure. The original version and the back-translated version of the tool were then compared, and few differences which were identified on comparison were resolved with mutual discussion with forward and backward translators. The

translated version was reviewed by a group of expert physiotherapists working in various neurological conditions having an experience of more than 8 years in the field. Pilot version of the questionnaire was then tested on a sample of patients. After a rigorous review and few modifications, final version of Gujarati-FSS was synthesized and used in the study. None of the items required re-changes.

The study was conducted on 15 subjects between 25-60 years, having primary symptom of fatigue, and understanding both English and Gujarati languages. Those having adequate cognition and visited the Physiotherapy department during two visits approximately two days apart were included. Those with clinical depression or other psychiatric problems were excluded. All the participants were informed about the study and its objective, and those willing to participate were included. Baseline data collection included subject demographics (age, gender, marital status, education, number of years living in Gujarat, primary diagnosis and time of onset of fatigue) and presence of co-morbid conditions. FSS was measured in all the subjects in English and Gujarati languages. FSS is a self-administered questionnaire with 9 items (questions) investigating the severity of fatigue in different situations during the past 2 week. Grading of each item ranges from 1 to 7, where 1 indicates strongly disagree and 7 strongly agree, and the final score represents the mean value of the 9 items. The mean score of the nine items is used as the FSS score. A higher score indicates more fatigue and less activity. Originally, the cut-off score for fatigue was set to be ≥4, because fewer than 5% of healthy controls rated their fatigue above this level while 60%–90% of patients with medical disorders experienced fatigue at or above this level. Data analysis was performed using IBM-SPSS version 20.00. Level of significance was at 5%.

Step 1: Forward translation
Step 2: Synthesis
Step 3: Backward translation
Step 4: Expert review
Step 5: Pretesting
Step 6: Gujarati version PADS

Fig. 1: WHO steps of translation[6]

Face and content validity of the FSS was evaluated by members of the expert committee (n=8) having experience of 22.5 ± 1.5 years, and was further evaluated through qualitative analysis of the pretest interviews. The internal consistency of the FSS-Gujarati was examined by Cronbach's alpha (α) and to measure test-retest reliability, Intra-class Correlation Coefficient (ICC) was calculated. The scale was considered stable if ICC was> 0.70 as per guidelines given by Deyo R et al.[7] For test-retest reliability, readings were documented on first occasion and again 24 hours later. For inter-rater reliability, two different raters assessed the fatigue scores on the same day, separated by 1-hour interval.

Results

Participants consisted of 9 women and 6 men, with mean age 45.6 ± 5.3 years. Number of participants having parkinsonism were 5, and those having post-polio syndrome were 10. Eight subject experts who reviewed the Gujarati-FSS had experience of 8.56 ± 2.39 years. Mean FSS score was found to be 4.59 ± 0.39 (95% CI: 3.8 to 5.1).

Validity: For face and content validity, an expert panel of 8 professionals, consisting of neurologists, orthopedicians as well as physiotherapists, having mean experience of 8.56 ± 2.39 years was included. The concurrent validity assessed using Pearson's correlation co-efficient of each component as well as total score is shown in table 1.

Reliability: Gujarati-FSS was found to have good internal consistency as measured by Cronbach's alpha of 0.76. Item wise Cronbach's alpha also revealed good internal consistency, and none of the items significantly affected the total score consistency as displayed in table 2. The ICC value was found to be 0.81 (95% CI: 0.75 to 0.84), which suggests substantial level of inter-rater reliability. Test-retest reliability was found to be 0.78, suggesting good consistency over time by the same rater.

Table 1: FSS item wise and total score correlation co-efficient

	Item	***r* value**
1.	My motivation is lower when I am fatigued	0.85
2.	Exercise brings on my fatigue	0.68
3.	I am easily fatigued	0.82
4.	Fatigue interferes with my physical functioning	0.80
5.	Fatigue causes frequent problems for me	0.65
6.	My fatigue prevents sustained physical functioning	0.78
7.	Fatigue interferes with carrying out certain duties and responsibilities	0.69
8.	Fatigue is among my three disabling symptoms	0.74
9.	Fatigue interferes with my work, family, or social life	0.71
	Total	0.81

Table 2: Internal consistency of each item in FSS

Item	**Corrected item total correlation**	**Correlation co-efficient if item deleted**
1	0.439	0.722
2	0.321	0.772
3	0.497	0.741
4	0.483	0.878
5	0.584	0.824
6	0.415	0.754
7	0.721	0.768
8	0.481	0.740
9	0.515	0.832

Discussion

Previously, FSS has been translated into various languages and this study was done to determine the psychometric properties of Gujarati version of FSS. Concurrent validity of FSS was found to be 0.81, internal consistency was 0.76, test-retest reliability was found to be 0.78 and ICC value was 0.81. These values suggest acceptable psychometric properties in terms of reliability and validity.

The ICC values are identified as fair for <0.40, moderate for 0.40–0.59, substantial for 0.60–0.79, and excellent for ≥0.80.[7]ICC values ranging between 0.80 to 0.97 have been reported previously in subjects with late effects of polio.[8] In accordance with this, current study also observed good reliability across subjects. Terwee et al have also established that ICC greater than 0.70 was defined as minimal acceptable level of reliability.[9] Vasconcelos et al assessed three different traditional questionnaires of fatigue and compared them on validity and applicability in post-polio syndrome patients. Their results indicated that scores on the FSS most closely agreed with the intensity of self-reported fatigue.[10]

The internal consistency of the FSS-Gujarati, examined by Cronbach's alpha (α) was estimated to be 0.76. Cronbach's alpha (α) should be at least 0.7 as an indicator of the satisfactory homogeneity of the items within the total scale.[7] This, further emphasizes the internal consistency of FSS-Gujarati to be strong, suggesting it to be a useful means to determine fatigue in chronic neurological conditions. Horemans HL et al in a similar study which compared various questionnaires of fatigue showed good internal consistency of FSS (Cronbach's alpha= 0.85).[11]

Fatigue has been examined in prior studies as well, and the correlation for fatigue has been consistently moderate. Schanke et al compared the descriptiveness of VAS for fatigue with FSS and found it to be moderate.[12] In the current study, correlation coefficient for validity between FSS-English and FSS-Gujarati was found to be 0.81, suggesting substantial strength of the scale in terms of validity. Rosti-Otajärvi E et al concluded that FSS showed moderate/high correlations with the perceived burden of the disease, quality of life and disease severity, whereas, age or gender did not have a significant effect on the FSS score.[13]

In India, a previous study done on translation of FSS into Hindi, concluded significant reliability with Cronbach's alpha of 0.91. All items in this study had correlation coefficients of more than 0.90 and p value less than 0.01, and none of the items if deleted, affected the Cronbach's alpha.[5] Much in line with this, our study also reflected acceptable internal consistency and ICC, and nor did any item affect internal consistency of the scale as a whole. Mean FSS score in this study was found to be 4.59 $\pm$ 0.39 (95% CI: 3.8 to 5.1). This is comparable to studies done by Krupp et al for translation of FSS in English and by Rosti in Finnish, where mean FSS scores were 4.8 $\pm$ 1.3 and 4.5 $\pm$ 1.7 respectively.[5,13] Validity and reliability of an assessment are contextual, and this study shows that Gujarati-FSS is psychometrically feasible to assess perceived fatigue among Gujarati patients.

Few limitations can be considered in the study. Construct validity, comparing FSS with other measures of fatigue was not assessed and may be conducted in the future. Similar to other self-report measures, FSS is also likely to be influenced by factors like recall bias, but owing to the findings of this study, psychometric properties of Gujarati-FSS are within acceptable limits and provide an appropriate measure for use in epidemiological studies exploring fatigue.

Conclusion

Gujarati version of the FSS is a valid and reliable measuring tool for the Gujarati population for measuring fatigue. This scale can be of great use to clinicians and researchers in Gujarat for evaluating and managing impairments like fatigue, most commonly seen across various neurological conditions.

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Conflict of Interest: Nil.

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FSS Questionnaire

છેલ્લા ૧ અઠવાડિયામાં, મેં નોધ્યું છે કે,

૧	જ્યારે હું થાકી જઉ ત્યારે મારો ઉત્સાહ ઓછો હોય છે.	૧	૨	૩	૪	૫	૬	૭
૨	કસરત મને થકાવી દે છે.	૧	૨	૩	૪	૫	૬	૭
૩	હું જલ્દી થાકી જઉ છું.	૧	૨	૩	૪	૫	૬	૭
૪	થાક મારા શારિરીક કાર્યોમાં દખલ કરે છે.	૧	૨	૩	૪	૫	૬	૭
૫	થાકને લીધે વારંવાર મને તકલીફ પડે છે.	૧	૨	૩	૪	૫	૬	૭
૬	થાક મને સળંગ શારિરીક કાર્ય કરતા અટકાવે છે.	૧	૨	૩	૪	૫	૬	૭
૭	કેટલીક ફરજ અને જવાબદારી પુરી કરવામાં થાક દખલ કરે છે.	૧	૨	૩	૪	૫	૬	૭
૮	થાક એ મારી ત્રણ અકાર્યક્ષમતામાંનુ મહત્વપૂર્ણ લક્ષણ છે.	૧	૨	૩	૪	૫	૬	૭
૯	થાક એ મારા કામ, પરિવાર અને સામાજીક જીવનમાં દખલ કરે છે.	૧	૨	૩	૪	૫	૬	૭

Prevalence of sensory processing dysfunction in children with difficulties in learning

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Abstract

Introduction: Sensory Processing Dysfunction (SPD) is the impaired ability to receive, process and react to sensory information in an adaptive way. It has been associated with conditions like Learning Disabilities, Autism etc. Affection of the sensory systems may result in difficulties in learning and cause the child to fall behind in class.

Aim: To find the prevalence and types of SPD in children with difficulties in learning.

Materials and Methods: This study was a cross sectional analytical study conducted in the community. The sample size was calculated as 286, based on prevalence from a pilot study, acceptable error 6%, confidence interval 95% and non response 10%. Convenient sampling technique was used. The Short Sensory Profile (SSP) was used as an outcome measure.

Statistical Analysis: SSP was scored as per the manual provided. Descriptive analysis was done using excel.

Results: 53.46% of the sample considered had definite SPD, 25% probable SPD and 21.54% showed typical performance. Maximum affection was found to be in the order of auditory filtering, low energy/ weak section and under-responsive/ seeks sensation sections of SSP.

Conclusion: In this study, prevalence of SPD with difficulties in learning in children was determined as 53.46%.

Keywords: Sensory processing disorder, Difficulties in learning, Sensory integration, School children.

Introduction

Sensory integration has been defined as the 'neurological process that organizes sensation from one's own body and environment and makes it possible to use the body effectively within the environment.'[1] It develops the most during an adaptive response that is purposeful, goal directed response to a sensory stimulus from the environment. It results in learning something new. According to Ayres, taking in and processing sensations from the environment forms the core of learning. Impairment in this would result in difficulties in adapting and learning. Such problems lead to slow learning and poor behavior although it may not be apparent to untrained individuals. School going children not only have to learn many new things but they also have to be socially competent within their environment. These complex activities require large amount of sensory integration.

Sensory processing is the way in which central and peripheral nervous system manage incoming sensory input from the seven sensory systems- vestibular, proprioceptive, tactile, auditory, visual, taste and olfactory. Accurate perception of sensation and its modulation are the keystones of sensory integration that in turn result in learning. As SPD is the impaired ability to receive, modulate, interpret and react to sensory information in an adaptive way, a child with processing disabilities may interpret information insufficiently as he may receive inadequate, excessive or inaccurate feedback from the mentioned sensory systems. This could impair the child's performance and refinement of skilled activity.[3] The learning pattern of a child with SPD would be disorganized and inefficient. Children with SPD have already been shown to have affected motor control and planning. This could result in poor postural control, clumsy movements or avoidance of or excess motor activity. Processing of each system individually and in combination with each other will affect learning and thus performance in academics and school.

A study conducted in the USA, 13.7% children enrolled in kindergarten were found to have SPD.[4] Failure of integration in these children may result in them growing up to fall back in class. Literature shows that without intervention, children with SPD could not cope with demands on them and thus may fail to excel.[5] At the same time, there has been evidence about the efficacy of physical therapy interventions in improving academic performance in children with SPD.[6-9] The government of India has recently announced that instead of just spreading education they want to focus on improving learning.[10] With physical therapy intervention showing positive results, improved sensory processing ability would help these children achieve their abilities and boost their self-esteem and confidence. Therefore the need of this study was to find out the prevalence of SPD amongst these academically low achieving children.

Materials and Methods

The study conducted was a cross-section analytical study in the local schools of Pune, Maharashtra. The study population was school going children with difficulties in learning.

The inclusion criteria were boys and girls, age 6 to 15 years with reported difficulties in learning, and whose academic performance was repeatedly below 50% or grade C. The exclusion criteria was children with mental retardation (I.Q. below 70), on the age appropriate Colored Progressive Matrices and Standard Progressive matrices, as checked by trained psychologists, were excluded from the study. Children with known neuro-motor disorders, children with known orthopedic conditions and children with known

but uncorrected visual or auditory impairments were also excluded. Sampling technique used was convenient sampling.

Sample size was estimated based on a pilot study conducted on 36 children who had difficulties in learning as reported by the teachers. A prevalence of 41.7% of SPD was found in these children. Taking this prevalence into consideration, with an acceptable error of 6% on either side at a confidence level of 95%, the sample size was calculated as 260. Assuming a non-response of 10%, the final sample size was considered as 286. The acceptable error of 6% was considered instead of 5% to make the calculated sample size feasible.

The instrument used was the 'short sensory profile' (SSP)by Winnie Dunn to screen the children.[11] The short sensory profile is a caregiver questionnaire that consists of 38 items grouped into 7 sections for the purpose of easy interpretation. As per the manual provided with the questionnaire, the results are interpreted as typical performance, probable difference and definite difference based on cut off scores provided in the manual. The total score is to be interpreted as well as the individual score on each subscale can be interpreted. It is valid, reliable and has been used in the Indian population.[12,13]

Ethics clearance was obtained from D. E. Society's Brijlal Jindal College of Physiotherapy institutional Ethics Committee. The principals of various local schools were approached for the study. A meeting was conducted for the teachers to instruct them to screen the children with difficulties in learning. Children who were achieving 50% or less (C grade) in the past 3 semester exams were picked up by teachers. They were the children reported by teachers and parents as those finding it difficult to cope with the class. The children were then screened as per the inclusion and exclusion criteria and the sample was chosen. A meeting with the parents of the children who met the inclusion criteria was conducted. The need, purpose and nature of the study were explained to them. Written consent about their willingness to participate was taken. The parents were interviewed in groups of 10-15. The questionnaire was handed out to the parents. The parents were asked to fill in the initial details: name, age and class of the child. The parents were asked to write their own name and their relation to the child as well. The importance of completing each item was emphasized upon to the parents. The nature of picking the most appropriate option for each component of the SSP was explained.

Each component of the SSP was elaborated upon and personal queries were taken up. The questionnaires were collected and checked if each component was filled, as failure to do this would mean that raw score for that section would not be computed.

Once the questionnaires were collected from the parents, the scoring was done on the questionnaire itself as per the manual. The results were interpreted as typical performance, probable difference and definite difference.

Each one of the seven components on the Short Sensory Profile was computed separately as well as the total score on the profile was computed at the end of each child's data entered.

Percentages were calculated and children were divided into groups of children showing typical performance, probable SPD and definite SPD.

Descriptive analysis of the data was done.

Results

This study was conducted to find out the prevalence of SPD in children in age group 6 to 15 years, with difficulties in learning. Total sample collected and analyzed at the end of the study was 260. Table 1 shows that 75.77% of the sample were in the age group of 6-10 years while 24.23% were 11-15 years of age.

Table 2 shows that 67.31% of the sample were males while 32.69% were females.

Table 3 provides the percentage distribution of children in each group as per the total scores achieved on the SSP; 53.46% children had definite SPD, 25% had probable SPD and 21.40% showed typical performance.

Table 4 shows that out of the 53.46% children who had definite SPD, maximum children had affected auditory filtering followed by under-responsive and seek sensations and then low energy or are weak sections of the SSP. Least affection was found in movement sensitivity issues and taste or smell sensitivity.

Discussion

This study was conducted to establish the prevalence of SPDs in children with difficulties in learning.

76% of children with difficulties in learning were in the age group of 6 to 10 while 24% were from 10 to 15 years. Less percentage in the latter group could either be due to high dropout rates in India after the 5th standard[14] or maybe, with increasing age, the children learned to cope with the academic demands as they got more fluent with language and exam patterns. 67% of children with difficulties in learning were boys while the rest were girls. This educational gender gap despite high enrollment ratio could be attributed to differences in brain structures and function between the two genders.[15]

53.4% children had definite SPD based on their total scores on SSP. Their SSP scores were further assessed and it was found in the order of hierarchy that highest affection was in the auditory filtering section (91.7%), then responsive or seeks sensation section (79.86%) followed by the low energy and weak sections (76%).

The auditory filtering section of the SSP reflects sensory integration of the sensations processed by the auditory system. The under responsive or seeks sensation section as well as the low energy weak sections represent the vestibular and the proprioceptive systems.

The reason behind these three subsections being maximally affected could be due to anatomical and physiological proximity of the auditory and vestibular systems.[16,17]

Affection of the auditory filtering section reflects the inability of the child to differentiate and organize various

sounds from the surrounding. This may result in the child not being able to correctly register and modulate what the teacher is teaching in class resulting in poor understanding and grasping.

With a high pupil teacher ratio in India,[18] the children with auditory filtering section affected who are sitting at the back of the class or close to windows might not be able to register and process what is being taught in class further affecting their learning. Environmental modifications should be suggested for these children.

Children with bilateral vestibular integration issues may appear lost in space, having trouble with spatial interpretation resulting in difficulties in reading and writing. They may have trouble performing smooth and rhythmical movements, difficulty with gaze stabilisation and tracking thus making reading a sentence from the black board or in the book difficult. These children also have poorly established 'handedness'.

Affection of the proprioceptive system[19] will result in impairments in motor planning resulting in the child being clumsy or awkward, preferring known play patterns and activities to new ones, have trouble organizing his surroundings etc. This will result in these children learning to write numbers or letters later than normal, having slower speeds of writing or applying too much or too little pressure on the pencil making their handwriting illegible.

Affection of the tactile[20] and proprioceptive systems together may result in excess or too little grip strength and pressure while writing resulting in illegible handwriting or too slow a writing speed.

The 25% children who had probable SPD need to be looked into in more detail for assessing their sensory processing abilities.

With such a high prevalence of SPD, these children must be given a fair chance to compete with their batch mates by their timely identification, provision of necessary environmental modifications and treatment so that they could achieve their true potential.

Awareness regarding SPD in children with difficulties in learning must thus be spread amongst physiotherapists, parents and teachers of school going children. Basic screening techniques like use of the SSP should be done by therapists on a regular basis. With many studies indicating academic gains in children with learning difficulties, developmental coordination disorder, sensory integrative dysfunction therapy in various forms should be implemented in who have SPD as well. Therapists should be included in the school staff for timely inhouse (within school campus) assessment and treatment.

Given that the sample considered in this study were not already diagnosed cases of learning disability, the children who had definite SPD could be further referred for learning disability screening and then given the necessary aid if found to have it.

The same project could be taken up at a national level in order to further emphasize the prevalence of SPD in children with difficulties in learning. Gender differences in sensory processing of children with difficulties in learning who had SPDs could be studied in details and comparative cohort studies can be done on children with difficulties in learning that have SPD to check the effect of intervention on self-esteem and potential achieved in future life.

Along with SPDs, influence of socio-economic factors, behavioral issues, social and environmental issues on learning, as confounding factors were not considered in the study as it was conducted in a stipulated period of 6 months. Further studies should be conducted keeping in consideration these factors as well.

Table 1: Percentage wise distribution of subjects according to age

Age (in Years Completed)	Percentage of Subjects
6-10 years	75.77%
11-15 years	24.23%

Table 2: Percentage wise distribution of sample according to gender

Gender	Percentage of Subjects
Males	67%
Females	33%

Table 3: Percentage of children in each group as per the total scores achieved on SSP

Percentage of children showing typical performance	Percentage of children showing probable SPD	Percentage of children showing definite SPD
21.40%	25%	53.46%

Table 4: Performance of children with definite SPD on individual sections of SSP

	Definite Affection	Probable SPD	Typical Performance
Auditory filtering	91.37%	5.04%	3.60%
Under responsive/ seeks sensation	79.86%	12.95%	7.19%
Low energy/ Weak	76.26%	14.39%	9.35%
Tactile sensitivity	65.47%	18.71%	15.30%
Visual/ auditory sensitivity	32.37%	23.74%	43.88%
Movement sensitivity	31.65%	16.55%	51.80%
Taste/ smell sensitivity	30.94%	18%	51.08%

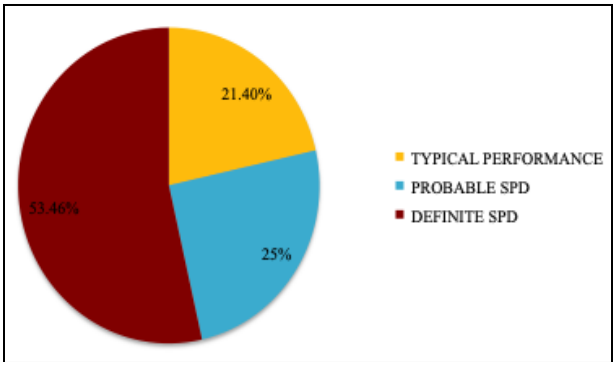

Fig. 1: Diagrammatic representation of sensory processing abilities of children based on total scores achieved on SSP into definite SPD, probable difference and typical performance.

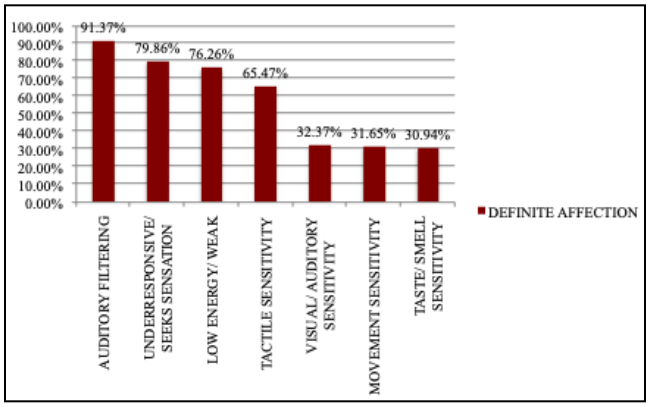

Fig. 2: Graphical representation of definite affection in individual sections of SSP of those children who had definite SPD on their total scores.

Conclusion

The study concluded that 53.4% children with difficulties in learning had definite SPD while 25% had probable SPD and needed more detailed evaluation. Highest affection in the children identified to have SPD was in the Auditory Filtering section of the SSP followed by Under-responsive and then the Low Energy and Weak sections of the SSP.

A high prevalence of SPD in children with difficulties in learning warrants the need to look more deeply into the matter and to have these children screened, identified and timely treated by physiotherapists.

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To study the variability in intensity of muscle soreness by the change in direction of application of myokinetic active release

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Abstract
Introduction: Studies have identified that muscle imbalance is seen often. Muscle that is shortened over a long time results in tightness. This can be treated by modalities, postural modifications and releases. Deep releases cause myogenic condition that is muscles soreness. Due to forceful pressure taut bands break, that causes adhesions and inflammation in muscle which produces pain and reduces Range of Motion (ROM) of joint. In this study we used myokinetic active releases. Active Release Technique (ART) helps to alleviate pain and tightness and has shown improvement in increased flexibility and ROM immediately after the treatment.
Objective: This study is aimed to determine effect of change in direction of ART on experimentally induced muscle soreness.
Materials and Methods: Individuals with chronic neck pain, specifically due to trapezius muscle tightness were selected by random sampling and divided into Group A and B. Each group consisted of 20 patients. Neck range of motion (ROM) was measured with goniometer and Intensity of pain was scored with visual analogue scale (VAS) for both groups. Group A was treated with myokinetic active release towards the painful area and group B was treated with Myokinetic active release opposite to the painful area for 3 consecutive days.
Results: Reduction in pain in Group A was statistically significant at $p<0.05$ but not in Group B. Pre versus post intervention, increase in ROM in both groups was significant at $p<0.05$.
Conclusion: The study concluded that both methods result in increase of ROM, but only release given towards the painful area produces less muscle soreness and pain after intervention.

Keywords: Fascia, Muscle imbalance, Muscle tightness, Muscle soreness, Active release technique.

Introduction
Studies have identified that nowadays muscle imbalance is a common diagnosis.Muscle is a contractile tissue which brings about movements. Each movement at a joint is a coordinated activity of different groups of muscles.[1] Fascia is composed of collagenous connective tissue surrounding the skeletal muscles, joints, organs, nerves and vascular beds. The ability of fascial stiffness over a period contributes more actively to musculoskeletal dynamics. Imbalance of this regulatory mechanism results in increased or decreased myofascial tonus.

The role of fascia is creating distinctive compartments for muscles and in acting as an ectoskeleton for their attachment. In most of cases the muscles had extensive attachments to ligaments and fascia that effectively link the muscles together to promote their contraction as a co-ordinate unit.[2] Muscle Imbalance occurs when opposing muscles provide different directions of tension leading to joint dysfunctions.[3] Muscle contraction is the generation of tension in the muscle tissue results in lengthening or shortening of muscle. Muscle that is shortened for a long-time results in tightness.[4]

Muscular tightness is frequently postulated as an intrinsic risk factor for the development of a muscle injury.[5] Treatment of Myofascial pain requires a multifaceted approach. If left undiagnosed and untreated, it may develop into chronic pain with overlying functional problems. The treatment includes physical modalities, heat therapy, electrical therapy, postural mechanical and ergonomics modifications, massage, needling and deep release.[6]

After deep releases a myogenic condition can occur i.e. Muscle Soreness. Subjects with muscle soreness present with painful and tender muscles which are unable to move the adjacent joints through the full range of motion. The onset of muscle soreness occurs in the first 24 hours after release and the intensity will generally peak by 48-72 hours.[7] Due to forceful pressure in the depth of the muscles taut bands breakdown. This may produce adhesions in the muscles which may further lead to inflammation in the muscle. This inflammation produces pain which may reduce ROM of the joint to which muscle is attached.[8]

Several releases have been investigated for assessing the beneficial effects of decelerating the progress of muscle soreness. Myokinetic Active Release Technique is one of the most commonly used with in clinical practice. It is an application of deep digital tension over tenderness and asking the patient to actively move the tissue from the shortened to a lengthened position and breaking the adhesion formed. It is designed to alleviate pain and tightness and help the muscle to return to its normal position. ART has shown better improvement in increased flexibility and ROM immediately after the treatment.[9]

The aim and objective of the study is to find out the change in VAS and ROM after change in direction of active releases techniques and to compare the effect of Myokinetic active release towards the painful area and opposite to the painful area.

Materials and Methods

The experimental study was conducted at the various OPDs of SBSPGI, Balawala, Dehradun. The study included 40 participants who had chronic neck pain due to muscle tightness tested with movement. They were recruited using the random sampling method. Exclusion criteria of study included patients with inflammatory signs, continuous pain, neurological deficit, unstable pathology, previous surgery and disease in neck. Informed consent was obtained after proper explanation of the study objectives to all participants. The participants were divided into two groups, namely Group A and Group B. Each group consisted of 20 patients.

All participants were assessed for Pain and contra-lateral cervical side ROM with the help of VAS and Goniometry respectively. The painful area was marked and documented. For group A, the Myokinetic Active Release Technique for the trapezius muscles towards the painful area (Fig. 1) and for group B, the Myokinetic Active Release technique for the trapezius muscles opposite to the painful area was given for a period of 2-3 minutes for 3 repetitions in a session, and was carried for 3 days. VAS and Range of Motion was measured again at the end of 3rd session. Data was recorded and then analyzed.[9]

Result

According to the objective of the study, value of VAS and ROM after Myokinetic active release technique were compared between 2 groups using statistical tests which were performed using Graph Pad. Paired t-test was used to evaluate the pre and post values of VAS and ROM for both groups. The result shows that there is significant ($p<0.05$) improvement in VAS score and neck ROM in group A (Table 1). This means, that the Myokinetic ART towards painful area is an effective treatment for trapezius muscle pain, and effective to reduce both the pain and restricted ROM. However results for group B shows insignificant ($p>0.05$) changes in VAS score but significant ($p<0.05$) improvements in neck ROM after the treatment (Table 2). This means, that Myokinetic ART opposite to the painful area can improve the neck ROM but has insignificant role in reducing the muscle pain. The mean difference comparison between the groups shows that there is a significant improvement in VAS score (Fig. 1) and ROM (Fig. 2) between group A and group B. This means Myokinetic ART towards painful area is comparatively effective procedure than Myokinetic ART opposite to the painful area.

Discussion

This study was designed to check the variability in intensity of muscle soreness by the change in direction of application of Myokinetic Active Release Technique among chronic muscular neck pain patients. In this study, the Myokinetic Active release technique was effective in muscle soreness and pain when the release was given towards the lengthened area.

When the muscle remains in contracted state for a long time it becomes shortened. As the muscle gets shortened the muscle spindle and muscle fibers get close to the shortened area and make it strong and non-fragile. In this study for intervention, release was given towards the lengthened area in order to increase the blood circulation in the weak side. This also resulted in breaking of adhesions which were formed in the shortened area on the other hand, when the release was given away from weak area, it pulled the fibers of the dysfunctional zone and produce more stretch and may cause more soreness and pain.

One of the causes of scar tissues is micro trauma, leading to destruction of the sarcoplasmic reticulum. After the destruction of the sarcolemma, Ca2+ is released from ear the lesion. If there is a good blood circulation, there will be an excessive release of acetylcholine in the synaptic cleft, depolarizing the postsynaptic membrane. This increases the opening of Ca2+ channels, which together with the large amount of free Ca2+ crosses the presynaptic membrane contributing to the connection with the seminal vesicles and the diffusion of acetylcholine in the synaptic cleft. This prolonged muscle contraction of maximum effort provokes ischemia, hypoxia and accumulation of metabolic waste in the injury, as blood flow is compromised gathering Ca2+ is flawed, leading to lack of ATP and causing the crisis energy leads to release of nociceptive substances, which sensitize the injured area causing pain and formation of adhesions.

Previous studies have recently demonstrated changes in cell metabolism and blood flow before and after manual therapeutic interventions inhibition of taut bands changes in interstitial fluid with consequent reduction contracture and pain.[10] Nowadays soft tissue techniques like Myokinetic Active Release, Myofascial Release are used for the treatment which helps in breaking the adhesions, increasing the blood flow and lymphatic drainage resulting in increase of the soft tissue extensibility and improving ROM and Muscle Strength. Myokinetic Active release technique is application of deep tension over the tenderness and asking the patient to actively move the tissue from the shortened to the lengthened position and thereby breaking the adhesion.[11] Static stretching in positional faults can be counterproductive.[12]

Table 1: Comparison of pre and post VAS and ROM within Group A (Towards the painful area)

	Pre-Release	**Post Release**	**Significance**
VAS Mean±SD	7.15±0.65	4.25±1.65	p< 0.05
ROM Mean±SD	33.4±7.69	43.75±8.31	p<0.05

Table 2: Comparison of pre and post VAS and ROM in Group B (Opposite to the painful area)

	Pre Release	**Post Release**	**Significance**
VAS Mean±SD	6.7±0.64	5.1±1.26.	p>0.05
ROM Mean±SD	35.5±5.89	43.85±5.13.	p<0.05

Reduction in VAS by 1.6 which was found to be statistically insignificant ($p>0.05$)

Increase in ROM by 8.35 which was found to be statically significant ($p<0.05$).

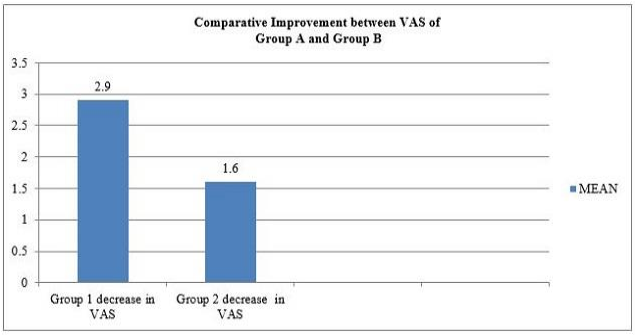

Fig. 1: Comparative improvement between VAS of Group A (Towards the Painful Area) and Group B (away from the painful area)

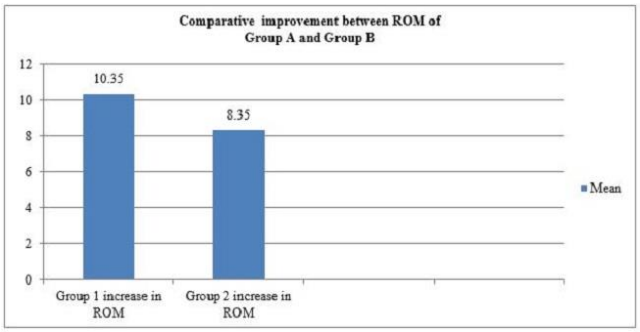

Fig. 2: Comparative improvement between ROM of Group A (Towards the painful area) and Group B (Opposite to the painful area)

Conclusion

Result of the study concluded that there is significant effect of change in direction of the Myokinetic Active Release. The release that was given towards the painful area produces less muscle soreness and pain.

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Conflicts of Interest: Nil

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Tight hamstrings: primary culprit for acute pelvic girdle pain: A case report

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Abstract
Sacroiliac joint (SIJ) pain is the most common type of pelvic girdle pain in youngsters with sedentary lifestyle, the incidence of which being 60% of all lower back pain. The pelvic girdle is stabilized by ligaments (sacrotuberous and sacrospinous ligaments) as well as by local muscles. Hamstrings along with sacrotuberous ligament provide posterior stability during functional activities. A 30 year old IT professional presented with acute onset of low back pain and difficulty in transition from sit to stand, walking & sitting for a long duration. Physical examination revealed disturbed Standing hip flexion test (SHFT), disturbed lumbo-pelvic rhythm, severely tight hamstrings & poor stability of pelvis. Based on the clinical findings, he was diagnosed as acute sacroiliac joint pain with anterior rotation of innominate. Manual therapy was aimed to achieve joint movement & correction of asymmetry, which led to significant short term functional recovery. Addition of hamstrings flexibility & core stability training resulted in functional betterment through correction of the asymmetry was not accomplished. Therefore, we can derive that the nociception that occurred was due to stress on the SIJ restricting the functional activity. Improvement in the functional ability and physiological movement of SIJ can be attained by correcting the muscle functions through manual therapy, exercise training, and pain rehabilitation.

Keywords: Hamstrings tightness, Sacroiliac joint, Pelvic girdle pain, Sedentary lifestyle, Innominate.

Case Study
A 30 year old IT professional with sedentary lifestyle developed an acute onset of pain in the right side of the lower back, buttock and posterior aspect of the right thigh after he had walked a long distance two days ago. Due to pain, it was difficult for him to walk, stand & sit for a long duration. After the onset of pain, he walked with a limp. The patient had no previous history of any symptoms in the lower back and extremities & no significant past medical history.

He felt a deep dull ache at the right side posterior sacroiliac ligaments area and around the right piriformis. The pain shot up intermittently while turning on the bed, long sitting, driving and during forward bending. The pain subsided in the prone lying position. The severity of pain on the numeric pain rating scale was six at rest and during forward bending the score was nine on ten with mild irritability.

On observation, weight bearing on the right leg during standing and the stance phase duration of the right leg during walking was reduced. On palpation, the right innominate had a relative anterior rotation on sacrum with an apparent limb lengthening compared to the left side.

Trunk flexion, right side lateral flexion, and left rotation were also guarded due to pain. Lumbar spine and hip joint had full pain free range of motion. Standing hip flexion test (SHFT) demonstrated the aberrant pattern of movement of right innominate as compared to the left. There was an excessive upward translation of innominate during hip flexion instead of typical posterior rotation of innominate. The transverse plane movement was equal bilaterally.[1]

On examination, multifidus, gluteal and hamstrings muscles were weak compared to their antagonists. Hamstrings were severely tight. On 90-90 test, first physiological resistance was noticed at 80 degrees of knee flexion. {Fig. 1} During the assessment of hamstring tightness, pain aggravated and referred to the posterior aspect of the right thigh. Piriformis and gastrosoleus were also moderately tight.

Fig. 1: 90-90 test for right hamstring tightness on a subject with right sacro-iliac joint pain

On palpation, tenderness was present over right posterior sacroiliac ligaments (short & long), piriformis, and biceps femoris muscle belly. SLR test provoked dull pain at the site of right sacroiliac ligaments at 50 degrees of hip flexion. There was no change observed with dorsiflexion & plantar flexion movements at the ankle. Three sacroiliac provocative tests (Distraction, Gensalen & compression) were positive.

The radiological investigations did not suggest any obvious pathology in the lumbar spine, pelvic girdle or at the hip joint.

From the above physical examination, the case was diagnosed as acute sacroiliac joint dysfunction with anterior rotation of innominate, based on which the following

physical therapy interventions were applied:

Physical Therapy Intervention

1st session: Three repetitions of leg pull manipulation in long axis were given followed by isometric contraction for hip muscles bilaterally to achieve innominate movement in the sagittal and transverse plane, after which stability exercises were initiated, which included isometric contraction of transverse abdominis, Multifidus, hip adductor, and abductor's.[2,3] {Fig. 2} {Fig. 3}

Immediately after the first session, the patient perceived up to 50% of reduction in pain during walking and forward bending. The patient was advised to continue the same exercises twice a day for 10 repetitions as a home program and an alternate day follow up

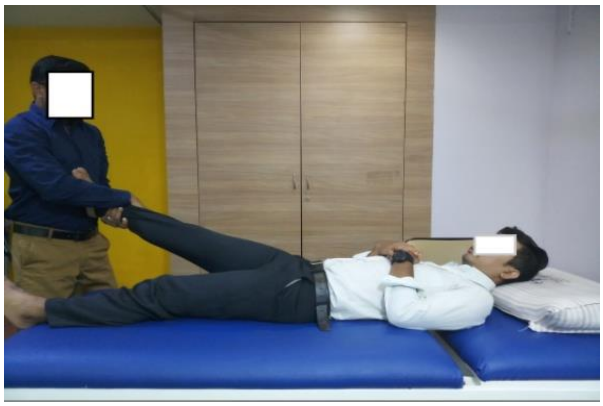

Fig. 2: Right lower limb pull manipulation in a patient with right sacro-iliac joint dysfunction was advised

Fig. 3: Isometric contraction to achieve sagittal plan innominate movement

1st Follow up session: Patient revealed similar findings as on Day 1, therefore the same physiotherapy interventions were performed along with the addition of active rhythmic dynamic hamstrings stretching in 90-degree hip flexion in supine lying.[4] {Fig. 4}

Fig. 4: Active rhythmic dynamic hamstrings stretching of right lower limb in patient with right sacro-iliac joint dysfunction

2nd Follow up session: There was a significant pain reduction during functional activities especially during walking and forward bending (the score was 2 on the numeric pain rating scale). Physical examination revealed a relative reduction in the tightness of hamstrings and superior translation of innominate on SHFT, although the asymmetry of right innominate remained moderately unchanged. SLR test provoked mild pain at the site of right sacroiliac ligaments at 70 degrees of hip flexion. The same interventions were performed without leg pull manipulation. Progressive hamstring flexibility exercises, piriformis stretching and active hip muscles strengthening were initiated.[5]

3rd Follow up session: There was no pain at the lower back and buttocks during walking and forward bending but minimal pain (2 on the numeric pain rating scale) after 30 minutes of walking and sitting. Reassessment suggested significant improvement in hamstrings flexibility, full and pain-free lumbosacral movements. SHFT test revealed reduced superior translation but typical posterior innominate rotation was still missing. SLR test provoked a small discomfort at the site of right sacroiliac ligaments after 80 degrees of hip flexion.

The plan of physical therapy interventions was modified to aim at flexibility and stability training of the Lumbo-Pelvic-Hip region. Active progressive flexibility for hamstrings, piriformis, and calf was continued and motor control level 1 training was initiated. Motor control training was continued for 2 weeks and gradually the patient had complete recovery in terms of symptoms and functions.[6]

After 6 months of close follow up there was no recurrence of lower back pain. The patient was educated on the biomechanical origin of pain, therapy progression & need for regular therapeutic exercises throughout the course of treatment.

Discussion

The pelvic girdle is one of the most common and disabling sources of acute onset lower back pain. The involved structures being the SIJ and the Pubic Symphysis.[1] To rehabilitate lower back pain, one needs accuracy in the

understanding of pelvic girdle biomechanics, appropriate examination and effective implementation of manual therapy & rehabilitation.[1,7]

Multimodal intervention in this case study and subsequent improvement signify the mechanical origin of pain and dysfunction. Tenderness over posterior sacroiliac ligaments, disturbed movement pattern, three [positive provocation tests, and poor hamstrings flexibility confirmed the source of pain as SIJ.[1] Significant pain relief immediately after the first visit while walking and forward bending was possibly due to inferior glide to innominate on sacrum and mobilization of innominate in the sagittal & transverse plane. This movement at SI joint significantly reduced the nociception and minimized secondary spasm to piriformis, quadratus lumborum, and other musculatures.[3] Manual long axis leg traction or manipulation along with sagittal & transverse plane innominate movements allowed immediate significant pain relief.[3]

Sagittal & transverse plane innominate movement was achieved by isometric contraction of the hip muscles. Biomechanics explains that the innominate & sacral movement is very minimal but essential to carry out functional activities efficiently.[2]

A recent RCT (Visser et al, 2013) concluded that manual therapy approach allows immediate joint mobility in order to reduce pain and functional activity, and is the choice of treatment for patients with SIJ-related leg pain.[10] Another experimental study by Kamali F and Shokri (2012) has confirmed that SIJ and lumbar manipulation is an effective technique for improving functional disability in patients with SIJ pain.[11]

The sacrotuberous ligament, sacrospinous ligament, and gluteals, allow stable movement pattern of the pelvic joint for the functional activities. Stable movement pattern or optimal stability has been defined as "the effective accommodation of the joints to each specific load demand through an adequately tailored joint compression, as a function of gravity, coordinated muscle and ligament forces, to produce effective joint reaction forces under changing conditions" by Vleeming et al.[7]

Poor function of the global and local stabilizers & movers affect the stable mobility leading to joint movement restriction either unilaterally or bilaterally.[5] Restriction of joint movements allows abnormal stress on the surrounding soft tissues during a task thereby eliciting nocioception. Actively or passively assisted movement at innominate or sacrum or both allows short term mobility facilitating pain-free physiological movement. This explains the short term benefits to the patient on the first visit.[3]

A comprehensive review by Benjamin et al. found moderate to strong-evidence in favour of manual mobilization/manipulation for pain, function, and overall health in the short-term in patients with different stages of LBP. Additionally, they have concluded that manual therapy along with exercises and other interventions is the recommendation for lower back pain rehabilitation.[12]

Hamstrings flexibility training along with manual therapy was significantly effective in long-lasting pain relief. Global/local muscles initiated the movements and hamstrings flexibility allowed smooth lumbopelvic rhythm.[4] Reduced hamstrings stiffness released the tension in sacrotuberous ligament and that reduced tenderness. In addition, hamstrings tightness was related to the weakness of the gluteus maximus (primary stabilizer). Gluteus maximus is the key muscle to stabilize innominate on sacrum posteriorly for all the functional movements of the trunk.[8] Piriformis flexibility & multifidus strengthening facilitated the good movement of the sacrum thereby adding to the lumbopelvic rhythm. Surprisingly there were no changes in the symmetry of the innominate which may indicate that postural asymmetry is not the cause of pain or dysfunction directly.[2]

Previous literature also showed the existence of static sagittal plane asymmetry in asymptomatic individuals, therefore correcting the asymmetry need not be the primary aim of rehabilitation.[9]

Conclusion

A present case report suggests that hamstrings tightness can be the primary culprit for acute onset of Sacroiliac joint or pelvic girdle pain. Essentially, pelvic girdle pain rehabilitation required the corrections of the physiological & functional movement pattern. Therefore, in order to achieve the best outcome, therapists need to have a comprehensive knowledge of biomechanics & pathomechanics of pelvic joints and appropriate skills to achieve normal joint functioning.

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Conflict of Interest: None.

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Evaluation of hot and cold sensation of hand in type 2 diabetic patients in age group of 40-80 years

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Abstract
Introduction: The aim of the study is to find out the effect of Type 2 diabetes (T2DM) on the hot and cold sensation of hand.
Material and Method: Total100 subjects in the age group of 40-80 year, both male and female were included in this study. Subjects were divided into 2 groups. Group A: 50 subjects diagnosed type 2 diabetic mellitus. Group B: 50 normal healthy subjects investigated and diagnosed Non-diabetic mellitus. Before the start of the procedure, detailed neuro-musculoskeletal evaluation was done to meet inclusion and exclusion criteria and those who were ready to be part of the study, the written informed consent was obtained from them. Rolyan hot and cold discrimination kit was used to examine hot and cold sensation of both hands at pulp of index finger, little finger and dorsal web space.
Result: There was loss of hot & cold sensation in 10% subjects of T2DM group at index and little finger bilaterally and all these subjects have the duration of diabetes >15yr.
Conclusion: loss of sensation may lead to injuries of diabetic hands. Hand care should be taught to the patients to prevent injuries to the hand.

Keywords: Type 2 diabetes, Hot and cold sensation, Diabetic hand.

Introduction
Diabetes will cause hand complication as 'diabetic hand'. The diabetic hand is defined as a syndrome of musculoskeletal manifestation of hand mainly, limited joint mobility, dupuytren's contracture and trigger finger in diabetic patients, usually associated with long-standing diabetes, suboptimal glycemic control, and microvascular complications.[1] Other complications with diabetes are tropical diabetic hand syndrome-hand infection, peripheral neuropathy ulceration, carpal tunnel syndrome etc, all these complications more common and frequent with diabetics.[1]

Diabetic neuropathy is more common in lower extremity so special consideration is given to evaluating the effect of type 2 diabetes (T2DM) on the lower extremities as it the primary cause of non-traumatic amputation.[2] The hand is the most important part of the body and well involve mobility, strength sensation and coordination in all ADL activities.[3] Studies have shown that sensory nerve changes may cause burn and ulceration of hand in diabetics.[4-6] Hence the need of study arises to evaluate the hot and cold sensation of type 2 diabetic hand.

The objective of this study is to assess the hot and cold sensation in normal healthy& T2DM subjects and compare between both groups.

Aim
The aim of the study is to find out the effect of Type 2 diabetes on the hot and cold sensation of hand.

Materials and Methods
After approval from the institutional Ethics committee and Maharashtra University of Health Sciences (MUHS), Nashik the study was started. All subjects were from the All India Institute of Physical Medicine and Rehabilitation, Mumbai. Detailed information about the purpose of the study was explained to all subjects and those who were ready to be part of the study were chosen as the subject. Written informed consent was obtained from all subjects. Duration of study was 12 months from the date of synopsis approval. 100 subjects in the age group of 40-80 year, both male and female were included in this study. Subjects were divided into 2 groups. Group A- 50 subjects diagnosed type 2 diabetic mellitus, Duration of DM from 1 year to 20 years, Glycemic control level – fasting blood glucose $\geq$126 mg/dl and postal prandial blood glucose $\geq$*200 mg/dl*. Group B- 50 normal healthy subjects investigated and diagnosed as non-diabetic mellitus. Blood glucose level > 300 mg/dl and all neuro-musculoskeletal& vascular disorders were excluded from study.

Rolyan hot and cold discrimination kit was used to examine the hot and cold sensation of both hands. Rolyan hot and cold discrimination Kit is designed to assess temperature discrimination by a simple, accurate and quantifiable method and it is quick, painless and easy to use. Each kit contains two probes or test tubes each for hot and cold temperatures, and a thermometer to determine water temperature. Thermometers in each probe indicate the exact temperature along the entire hot-to-cold range, for accurate assessment and reporting. One test tube or metal cylinder was filled with warm water and other with crushed ice. The ideal temperature for warmth was between 40-45 degree C and for cold was between 5-10 degree C. The side of the test tube was placed in contact with the skin of hands i.e. pulp of index finger, pulp of little finger and first dorsal web space. The Subject was asked to verbally indicate when an applied stimulus is recognized by responding to 'hot' or 'cold'. The

response was recorded for analysis. A Niamh et al[7] concluded cold detection threshold and warm detection threshold were found to have fair reliability.

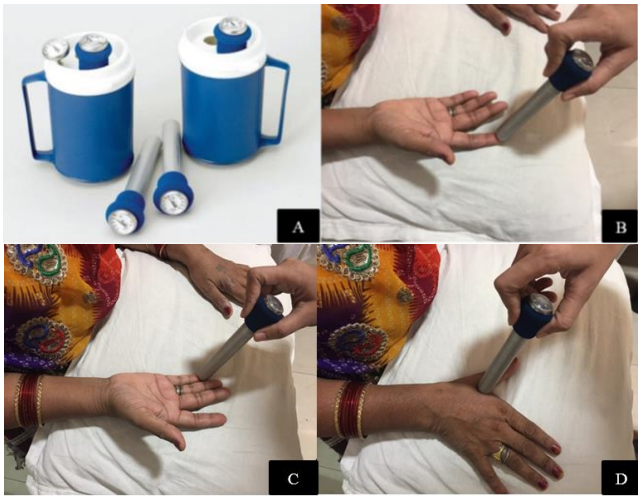

Fig. 1A): Rolyan hot and cold discrimination kit, **B):** Pulp of index finger, **C):** Pulp of little finger **D):** First dorsal web space.

Results

As data were nonparametric and quantitative, descriptive statistical analysis was done. The pie chart was used to show percentage.

Table 1: Percentage of subjects affected by hot & cold sensation in T2DM & Non-DM group

Percentage of subjects affected hot & cold sensation		
T2DM	**NONDM**	
Index finger	10%	0%
Little finger	10%	0%
Dorsal web space	0%	0%

Graph 1

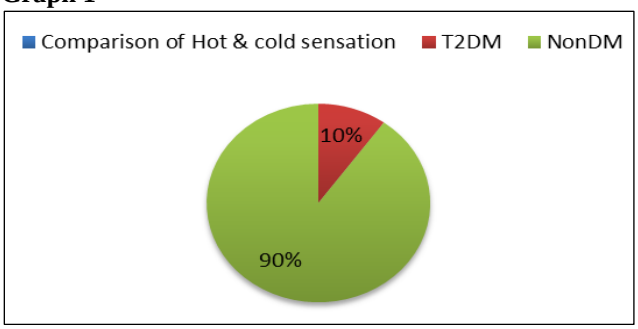

Table & graph 1 show percentage of subjects affected by hot & cold sensation in T2DM & Non-DM group. T2DM group 10% of subjects affected at index & little finger.

Discussion

In this study assessment of hot and cold sensation was carried out in 50 subjects in the age group of 40-80yr (mean age- 58.16±8.65) with the involvement of type 2 diabetes (Group-A) and compared with 50 Non-diabetic (Group-B) subjects of 40-80yr (mean age- 57.9±9.55).

Table & graph 1 show there is a loss of hot & cold sensation in 10% subjects of T2DM group at index & little finger area and no changes at dorsal web space area. All these subjects have a duration of diabetes >15yr. Kumar S et al[4] 1998 concluded that patients with diabetes may need to select their teacup more carefully. Coppini DV et al[5] 2000 found in a clinic that hand neuropathy may occasionally lead to anaesthetic injuries. T Chia Shun et al[8] 2004, concluded elevation of thermal threshold as increase duration of diabetes in type 2 diabetics.

Chronic sensorimotor distal polyneuropathy (DPN) is the most common form of diabetic neuropathy. DPN may be either sensory or motor, and involve small fibers, large fibers, or both. In diabetics, the longest nerve fiber being affected first, they are manifested by reduced vibration sensation and two-point discrimination.[9-11] Cutaneous receptors Merkel's discs & Meissner's corpuscles are highly concentrated in the fingertips, they play an important role in two-point discrimination touch and localization of touch,[12] in diabetics these sensations affected first, that could be region of affection of hot and cold sensation at tip of index and little finger but no changes at dorsal web spaces area. Decreased thermal pain threshold due to damage of small unmyelinated c fibers and a decrease in nerve growth factor (NGF) which maintain small fiber neurons.[8,10]

V Anita[13] et al concluded there is significant reduction in amplitude and conduction velocity of the median, ulnar, radial, peroneal and sural sensory nerves in asymptomatic diabetic patients as compared to healthy volunteers. Most commonly affected nerves are Median Nerve in upper limb and Superficial Peroneal in lower limb. Author result support that median nerve most commonly affected in upper extremity of diabetic, comparatively radial nerve and superficial radial nerve branch supply to dorsal web space of thumb, that could be region that hot and cold sensation not affected in this area.

Conclusion

This study concluded that 10% of Type 2 diabetics subject has loss of hot and cold sensation. Therefore while evaluating diabetic subject; evaluation of hand sensation should be done to prevent hand injuries and its disabilities.

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Conflict of Interest

The authors declare no conflict of interest

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Post nerve transfer neuroplastic motor retraining program in adults with traumatic brachial plexus injury: A physiotherapist's perspective

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Abstract
Traumatic Brachial Plexus Injury is a devastating, acquired peripheral nerve injury seldom due to road traffic accidents, involving young males, especially riding two wheelers. Recent epidemiological studies undertaken in Indian population suggest a 30% increase in the occurrence of traumatic brachial plexus injury over the years. There has been an advent of a lot of new surgical techniques for the treatment of traumatic brachial plexus injury, nerve transfers being one of them if the patient falls within the criteria's of carrying out a nerve transfer. As a physiotherapist rehabilitating these surgical procedures, one needs to have a thorough understanding of the anatomical aspects of the surgery and how to go about the rehabilitation of the same. Thus the aim of this narrative report is to discuss the rehabilitation techniques followed over a decade at a government tertiary care hospital leading to successful rehabilitation of traumatic brachial plexus injury patients.

Keywords: Nerve transfers, Rehabilitation, Traumatic brachial plexus injury.

Introduction
Traumatic Brachial Plexus Injury is a devastating, acquired peripheral nerve injury seldom due to road traffic accidents, involving young males, especially riding two wheelers.[1,2] There are different levels of brachial plexus injury viz upper trunk injury (involving C5-C6 or C5-C7 roots as shown in Fig. 2a), lower trunk injury (involving C8-T1 roots as shown in Fig. 2b) and global or PAN brachial plexus injury (involving C5-T1 roots).[1] Recent epidemiological studies undertaken in Indian population suggest a 30% increase in the occurrence of traumatic brachial plexus injury over the years.[2-4]

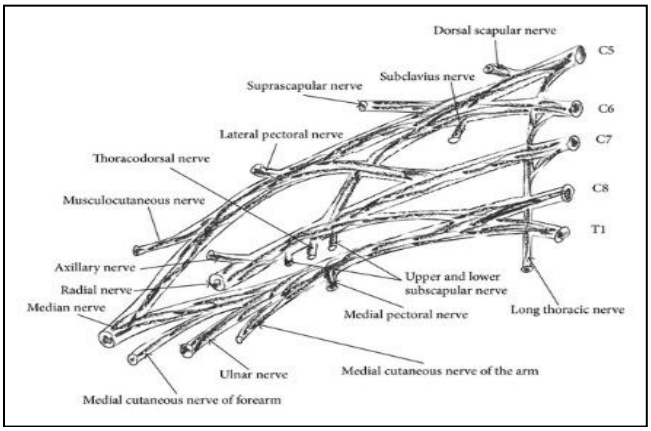

Fig. 1: Normal Brachial Plexus Anatomy (Courtesy: Sakellariou V et al, 2014. Retrieved from https://www.hindawi.com/journals/isrn/2014/726103/)

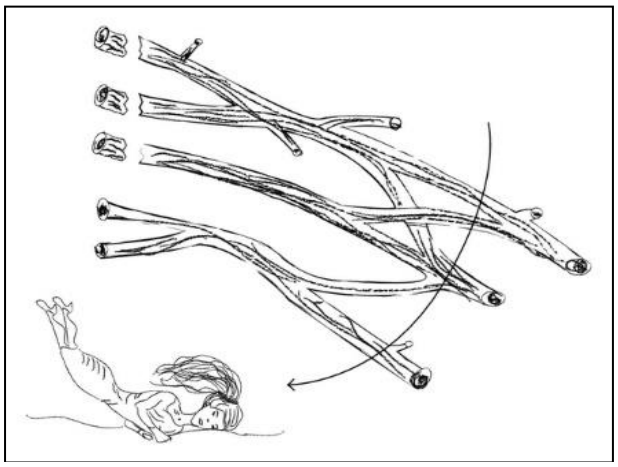

Fig. 2a: Upper plexus injury due to traction forces

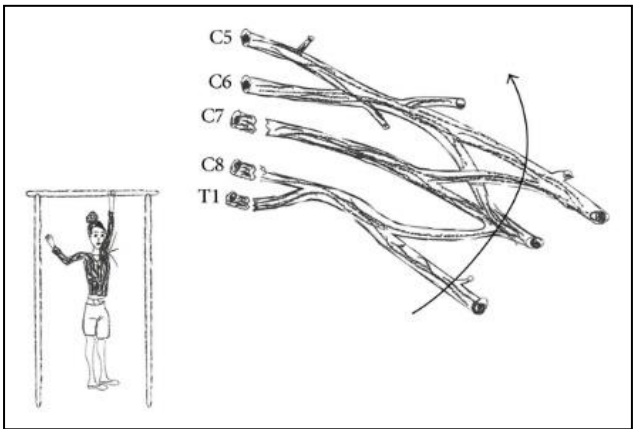

Fig. 2b: Lower plexus injury due to hyperabduction (Courtesy: Sakellariou V et al, 2014. Retrieved from https://www.hindawi.com/journals/isrn/2014/726103/)

Nerve transfers, rampantly used by reconstructive surgeons as a treatment strategy especially with superior results in upper plexus injury,[5] works on the principle of neuroplasticity. It involves invasion of the deafferented areas with the nerves innervating the adjacent area.[6]

Nerve transfer, also referred to as neurotisation technique, is a redirection or transfer of a viable and intact motor nerve from a muscle situation near the affected area that has sustained irreparable proximal damage, and co-apting it to a distal portion of the nerve there by crossing the affected portion of the nerve.[7,8] So there is a donor nerve (eg Ulnar Nerve) and a recipient nerve (eg Musculocutaneous Nerve) as shown in Fig. 3.

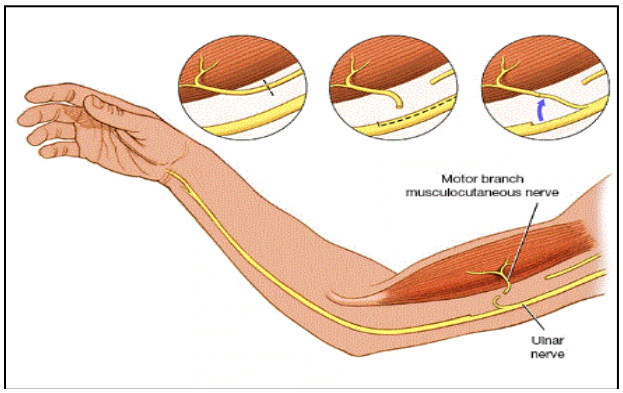

Fig. 3: Ulnar nerve transfer to motor branch of musculocutaneous nerve (Oberlin's transfer) (Courtesy: Mayo Clinic. Retrieved from https://www.mayoclinic.org/diseases-conditions/brachial-plexus-injury/multimedia/nerve-transfer/img-20008552 [Accessed 8 May 2019])

Aim

There has been an advent of a lot of new surgical techniques for the treatment of traumatic brachial plexus injury, nerve transfers being one of them if the patient falls within the criteria's of carrying out a nerve transfer. As a physiotherapist rehabilitating these surgical procedures, one needs to have a thorough understanding of the anatomical aspects of the surgery and how to go about the rehabilitation of the same. Thus the aim of the narrative report is to discuss the rehabilitation techniques followed over a decade at a foremost academic, government tertiary care hospital from Mumbai leading to successful rehabilitation of traumatic brachial plexus injury patients.

Discussion

Pre-surgery rehabilitation

Prior to the nerve transfer a physiotherapist must assess the level of lesion clinically and correlate with electro-diagnostic and electro-physiologic tests[9] to ascertain the level of lesion and the degree of injury. The motor and sensory assessment of the affected upper extremity must be done along with comparison to the unaffected side. Muscle strength assessment is done using British Medical Research Council grading.[10]

Table 1: British medical research council grading of muscles.[10]

0–No contraction
1- Flicker or trace of contraction
2 - Active movement, with gravity eliminated
3 - Active movement against gravity
4 - Active movement against gravity and resistance
5 - Normal power

The findings must also be discussed with reconstructive surgeon to make sure there is a holistic approach and consensus in managing the patients. The physiotherapist must understand the anatomical aspects of the surgery in order to understand that the muscles supplied by the donor nerve needs to be strengthened in order to reduce the chances of the residual weakness in the muscles of donor nerve post the transfer. This deals with the changes in body structure and body function aspect of International Classification of Functioning, Disability and Health along with understanding the patients present Activity Limitation and Participation Restriction as shown in Fig. 4.[11] Other clinical joint specific objective measures taken for brachial plexus injuries are Naraka's score for shoulder function,[12] the Waikakul's score for elbow function[13] and Raimondi's score for wrist and hand function.[14]

Along with assessing the patient with regards to the Body Functions and Structure component of International Classification of Functioning, Disability and Health, probing into the details of the contextual factors, quality of life and current functioning of the patient is essential as those factors also have a widespread impact on the recovery of the patient post the surgery. Subjective outcome measures must be taken like Disability Arm Shoulder Hand (DASH) which is a 30 itemed patient reported outcome measure with good reliability and validity.[15] Quality of Life Questionnaires also need to be taken which include 36 itemed questionnaire SF-36[16] and 26 itemed World Health Organization-Quality of Life BREF having good reliability and validity[17] to compare the difference post the surgery and optimum period of rehabilitation as patient satisfaction also is equally important as much as clinical improvement.

Patient education is a very integral part of the management during which therapist should come at par with patients understanding of the condition and their expectation from the surgery and rehabilitation. It includes imparting them with the knowledge of the importance of physiotherapeutic motor relearning program and educating them about the significance of their long term compliance in the treatment plan.[18]

Post-surgery Rehabilitation

After a successful nerve transfer, the patient is immobilized in a sling as shown in Fig. 5, for about 4-6weeks based on surgeon's discretion.

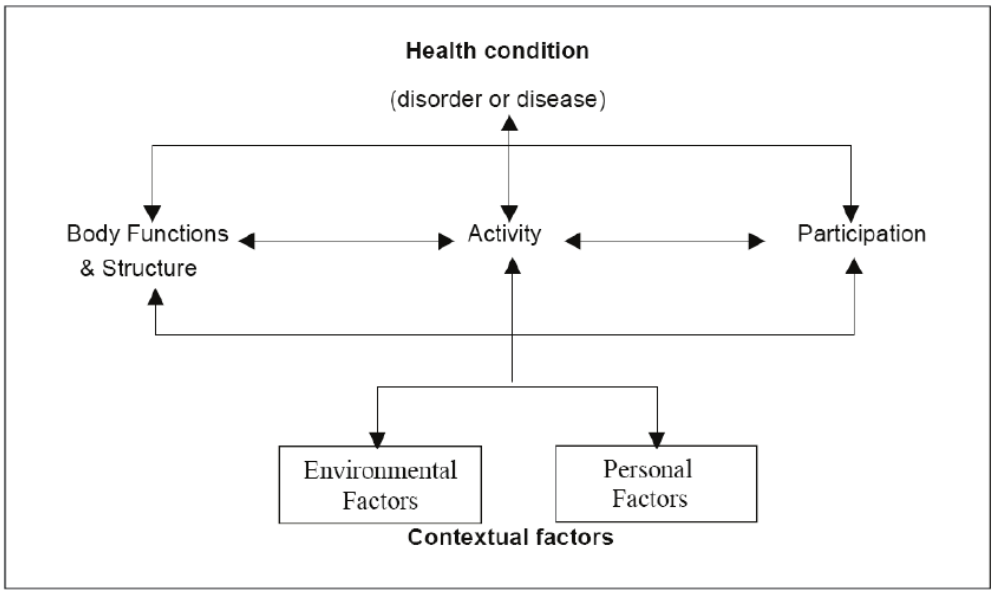

Fig. 4: ICF model demonstrating the bidirectional model and the various factors leading to the health condition. (Courtesy: World Health Organization, 2002. Retrieved from https://www.who.int/classifications/icf/icfbeginnersguide.pdf)

Fig. 5: Image of Traumatic Brachial Plexus injury patient without and with sling.

Nerve transfers are usually extraplexal, where the nerves are transferred from outside the plexus (eg.cranial nerve like spinal accessory nerve to suprascapular nerve and intercostal nerve to musculocutaneous nerve) or intraplexal where the nerves are transferred from within the plexus in case of partial brachial plexus injury (eg.Oberlin's transfer of ulnar or median nerve fascicle to musculocutaneous nerve).[1]

Initially we aim for the initiation of muscle contraction. Induction exercises are begun which are also referred to by Kahn et al as Donor Activation Focused Rehabilitation Approach (DAFRA)which are based on the anatomical aspects of the surgery.[19] Here the action of the muscle from the donor nerve is achieved prior in order to induce the action in the muscle of the recipient nerve. Just to give an example, when a fascicle of spinal accessory nerve supplying upper trapezius is transferred to the suprascapular nerve supplying supraspinatus, the training begins with simultaneous abduction and external rotation of glenohumeral joint along with elevation of the shoulder girdle and tucking of humeral head. We begin with a range of 45^{o} of abduction passively for the first week of

rehabilitation (after the requisite 4-6 weeks of immobilization period) and slowly progress to 10° abduction range every week. Some examples of Induction Exercises are shown in Table 2 and 3.

Table 2: Induction exercises for nerve transfers done to obtain Shoulder function.[1]

Surgery Done	Recipient Action	Donor Action
1. Spinal Accessory Nerve to Suprascapular Nerve	Shoulder Abduction & External Rotation	Shoulder girdle elevation
2. Radial Nerve of Triceps to Axillary Nerve (Somsak's technique)	Shoulder Abduction	Elbow Extension

Table 3: Induction exercises for nerve transfers done to obtain Elbow function.[1]

Surgery Done	Recipient Action	Donor action
1. Intercostal Nerve to Nerve to biceps	Elbow flexion	Active inspiration/ chest expansion exercises
2. Median Nerve fascicle to Nerve to biceps (Oberlin 2)	Elbow flexion	Wrist flexion/ Fisting
3. Ulnar Nerve Fascicle to Nerve to biceps (Oberlin 1)	Elbow flexion	Flexion and ulnar deviation of wrist
4. Contralateral C7 transfers	Elbow flexion	Contralateral elbow extension

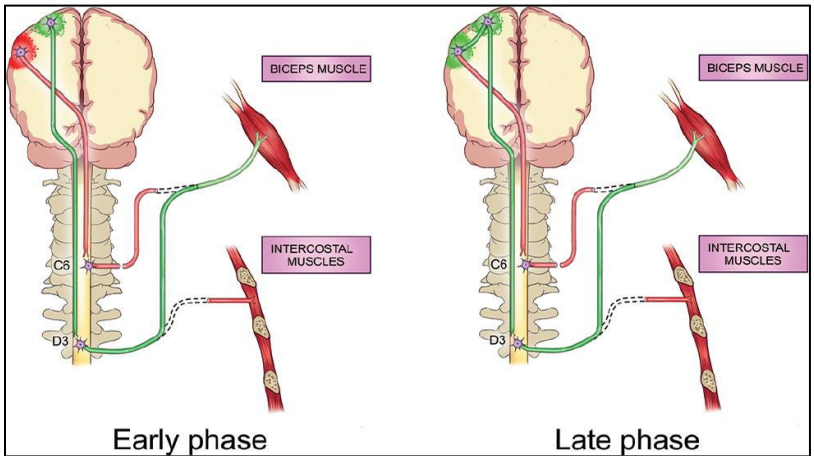

Fig. 8: Cortical plasticity post Intercostal Nerve to Nerve to biceps (Musculocutaneous nerve)(Courtesy: Socolovsky M et al, 2014 Retrieved from https://thejns.org/focus/view/journals/neurosurg-focus/42/3/article-pE13.xml)

Cross over therapy is done simultaneously, where in there is emphasis of contraction of the muscle of the contralateral unaffected side to facilitate relearning on the affected side. Studies have shown that it works through irradiation based on Sherrington's concept.[20, 21]

Graded motor imagery is a novice concept which has gained momentum in the recent years in the management of adult traumatic brachial plexus injury. It has three steps which includes implicit motor imagery involving right- left discrimination, followed by explicit motor imagery involving imagination of movements without actually performing them after which finally there is mirror therapy where the patients are asked to see the movement of the unaffected extremity on the mirror behind which the affected extremity is kept just for the patient to imagine that the movement is coming from the affected extremity, by activating the pool of the mirror neurons in the brain.[22] Struma et al suggests that graded motor imagery tends to facilitate cortical activation and therefore assist in bringing about neuroplastic changes in the brain through re-training. [23]

Neuro muscular electrical stimulation is used simultaneously, with electrodes placed over the muscle of the recipient nerve. It helps not only in producing a contraction of muscle of recipient nerve but also facilitates the growth and assists in the axonal regeneration of the affected recipient nerve.[24]When the muscle power is zero, a long duration interrupted galvanic current is used to bring about muscle contraction which is coordinated with contraction of donor muscle. When the muscle power progresses to one, a short duration faradic current is used. So we proceed from long pulse to short pulse gradually as muscle starts getting innervated. To give an example, when the intercostal nerve transfer is done to musculocutaneous

nerve (nerve to biceps), the initial muscle strength of biceps is zero. The electrodes are placed over the biceps. When the interrupted galvanic current produces the contraction in biceps, simultaneously the patient is asked to do the action of intercostal nerve which is deep breathing or chest expansion exercise, thereby following the method of induction exercises here as well.

Once the flicker is achieved in the muscle of the recipient nerve, slowly the dissociation of movements using Electromyography or Biofeedback is proceeded to, and a more controlled recipient contraction is the focus. Once a flicker is attained muscle is trained in the gravity eliminated plane to achieve a muscle power of grade 2. After grade 2 muscle strength is achieved, further strengthening is done using the rabands and weights.

Clinical Implication

The article implies to educate the therapists regarding the management protocol of Adult Traumatic Brachial Plexus Injury patients which has been designed and enhanced at foremost academic, government tertiary care hospital from Mumbai over a decade. The techniques used are hassle free and do not require extensive machinery hence convenient even for an average physiotherapy department. Studies have shown that individually these techniques have a successful outcome in the management of traumatic brachial plexus injury. Thus a strategic and systematic combination of all these techniques not only would deliver successful rehabilitation outcomes post nerve transfers but also help improve patient's quality of life.

Funding: Not applicable as this was a narrative report.

Conflicts of Interest: The authors declare no conflict of interest.

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Platform Presentation Abstracts

Day-II Session: Physiotherapy in Musculoskeletal Conditions & Sports.
Saturday, February 16, 2019
Gulmohar 9.00AM

AB No 10: Effect of incorporating diaphragmatic breathing exercise with the core stabilization exercise on pain and disability in chronic low back pain.

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Purpose: The purpose of this narrative review is to examine the effect of incorporating diaphragmatic breathing exercise with the core stabilization exercise on pain and disability in chronic low back pain.
Relevance: Diaphragm is the main inspiratory muscle, which plays an essential role in stabilizing the spine during ADLs. The diaphragmatic dysfunction is associated with pain and disability in chronic low back pain (CLBP).
Methods: Two reviewers searched on PubMed/Medline, scielo, Cochrane library, and PLOS for studies concerning CLBP and diaphragmatic exercise from January 2018 up to September 2018. The search string consisted of the following keywords: chronic low back pain, core stabilization exercise, diaphragmatic breathing exercise, proprioceptive postural control strategy, disability evaluation and trunk muscle activity. The aim of this review is to investigate the effectiveness of incorporating diaphragmatic exercise with core stabilization exercise on pain and disability in CLBP.
Results: A total of 33 published research was analysed. The result of this review indicates that core stabilization exercise alone improves the pain and disability in CLBP. The diaphragmatic breathing exercise was shown to improve respiratory function. There is a positive link between the strengthening of deep core muscle and improving respiratory function and lumbar stability. The individual with CLBP is having poor sleep leads to poor QOL.
Conclusion: The isolated breathing exercise and core stabilization exercise is effective in reducing pain and disability in CLBP and improving respiratory function. The therapist should be able to provide more effective treatment by incorporating both therapeutic exercise for CLBP patients.

Keywords: Chronic low back pain, Core stabilization exercise, Diaphragmatic breathing exercise.

AB No 40: Comparison of efficacy of mulligan's bent leg raise technique and passive stretching technique on hamstring flexibility in patients with chronic non-specific low back pain

Authors: Rushabh Shah, Megha Sheth
Affiliation: Faculty of SBB College of Physiotherapy

http://doi.org/10.18231/j.jsip.2019.010

Purpose: To compare the effect of Mulligan's Bent Leg Raise (BLR) technique and passive stretching on pain, balance and hamstrings flexibility in patients with chronic nonspecific low back pain.
Relevance: Low back pain is a common cause of disability in individuals. Adequate flexibility of the Hamstring muscles is essential to eradicate pain and maintain functional mobility which can be achieved by passive stretching of hamstrings. BLR is performed in symptom free range of motion that makes it safer than any other approach.
Methods: Twenty-two participants selected by convenience sampling, of both genders aged 20 to50 years, diagnosed with non-specific low back pain ≥3 months. Participants with traumatic onset, neurological symptoms involving prolapsed inter-vertebral disc, radiating pain were excluded. Random allocation into any one group was done. An interventional study was conducted. Group A, was given BLR, and Group B was given passive stretching of hamstrings. All participants were given hot-packs to low back, isometric abdominals, curl-ups, alternate knee to chest, and bilateral knee to chest exercises. Data collected included pain intensity by NPRS, degree of hamstring tightness by Active Knee Extension (AKE) and Functional Reach Test (FRT) for balance.
Analysis: Level of significance was kept at 5%. Mann Whitney test was used to compare the mean differences between both the groups.
Results: For Right AKE mean difference in group A=11.82±5.45, group B=5±3.44, U=16.50, p= 0.002, for Left AKE mean difference in group A=13.36±7.98, group B=5±3.95, U=21.50, p= 0.008, for FRT mean difference in group A=4.64±2.17, group B=2.5±1.77, U= 25.50, p=0.019, for NPRS mean difference in group A=3±0.77, group B=1.73±1.35, U=25.00, p=0.019.
Conclusion: Bent Leg Raise is more effective than passive stretching in decreasing pain, increasing hamstring flexibility and improving balance in subjects with chronic low back pain.
Implications: Bent Leg Raise can be used in subjects with nonspecific low back pain to decrease pain and improve hamstrings flexibility and balance.

Keywords: Bent leg raise, Nonspecific low back pain, Hamstring flexibility.

AB No 41: To determine the prevalence of work related musculoskeletal disorder (WMSDs) and its associated risk factors among school teachers in Delhi-NCR.

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Affiliation: Amar Jyoti Institute of Physiotherapy

http://doi.org/10.18231/j.jsip.2019.011

Purpose: To find the point prevalence of musculoskeletal disorders and associated risk factors in school teachers.
Relevance: The work related musculoskeletal problems are multi factorial, its prevention and treatment need the comprehensive approach. By studying other associated factor, we can have new insight to physiotherapists to treat the musculoskeletal disorders in teachers. Further it can also help physiotherapist to spread awareness about preventive measures regarding occupational health hazards in teachers.
384 teachers from private and government school of Delhi NCR with more than 1 year of experience were included in the study. Further teachers who had undergone any surgery in last 6 months, neurological problem, recent trauma, fracture, Pregnancy and any diagnosed gynecological problems are excluded from the study.
Method: After receiving the Permission from school authority and consent from teachers, a questionnaire developed by the researcher was distributed among 450 teachers. The questionnaire had three parts: A. Demographics, B. Nordic Musculoskeletal questionnaire, C. teachers stress inventory. 384 valid questionnaires were compiled in Microsoft excel.
Analysis: The data was analyzed by SPSS version 16 with descriptive statistics and person correlation coefficient.
Results: The study was conducted on 384 school teachers (M=79, F= 307) with mean age25.99±3.6years and Mean BMI25.99±3.6. The overall prevalence of musculoskeletal pain in school teachers is 65.1%.Out of this most affected area are knee (35.7%), ankle/feet (26.3%) and neck (24.2%) respectively. Further, results also showed moderate stress levels with mean score of 2.78± 0.77. Musculoskeletal problems showed significant correlation with BMI, Level of Teaching and stress levels with p value of 0.002, 0.026 and 0.000 respectively at 0.001 levels.
Conclusions: School teachers are susceptible to WMSD with a significant prevalence for knee pain followed with ankle/feet and neck pain. Moderate level of stress, high BMI and teaching level are associated factors of WMSDs.
Implication: The results of the study will be beneficial to spread the awareness regarding common problems faced amongst teachers. Further it can also help in formulation of preventive strategies by physiotherapy professional.

Keywords: Work related Musculoskeletal Disorders, Teachers, Stress level.

AB No 16: Comparison of proprioception and dynamic balance in participants with and without functional flatfoot

Authors: Umang Agrawal, Sanjeev Kumar, Gauri Chaitanya, Abhisha Patel, Ganesh B, Prateek Srivastava
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http://doi.org/10.18231/j.jsip.2019.012

Purpose: In flatfoot normal mechanisms get affected in subtalar, ankle and knee joint which may affect the proprioception and dynamic balance. There is dearth of literature concerned with proprioception and dynamic balance in flatfoot. Hence, a comparison of affection of dynamic balance and proprioception in people with and without functional flatfoot is required.
Relevance: This study will help determine whether dynamic balance and proprioception are affected or not in participants with and without flatfoot.
Participants: A total of 32 participants were included in the study, 16 in flatfoot and 16 in normal arch group. Inclusion criteria for flatfoot group is participants with functional flatfoot of grade 1 or more on Feiss line within the age group of 18-30 years and for normal arch group is participants with normal arch on Feiss line within the age group of 18-30 years. Exclusion criteria for both the groups is participants with any musculoskeletal, neurological condition affecting balance and proprioception and participants unable to perform Star Excursion Balance Test (SEBT).
Methods: Cross-sectional study. Outcome measures are SEBT, AUOTCAD software for checking joint repositioning error and Feiss line.
Analysis: Data analysis was done using SPSS version 16.0 using descriptive statistics and independent t test.
Results: There was no statistically significant difference in dynamic balance and joint repositioning error between participants with grade 1 functional flatfoot and normal arch.
Conclusion: Dynamic balance and proprioception of the participants with grade 1 functional flatfoot was not significantly affected as compared to participants with normal arch. Further recommendation is to include participants with higher grade of functional flatfoot.
Implication: If proprioception and dynamic balance was affected in participants with functional flatfoot, then balance and proprioception exercises can be included in the rehabilitation of the same.

Keywords: Proprioception, Dynamic balance, Flatfoot.

AB No 50: To find the effectiveness of Pune shoulder rehab protocol (Psrp) on patients with frozen shoulder

Author: Seema Saini, Gargee Bhagat, Tushar Palekar, Shweta Pachpute, Gaurang Baxi, Soumik Basu
Affiliation: Dr. D. Y. Patil College of Physiotherapy.

http://doi.org/10.18231/j.jsip.2019.013

Purpose: PSRP is a treatment program which has been in use for more than 10 years. However, there are no documented studies to find its effectiveness.
Relevance: PSRP is an exercise program that consists of 3 phases out of which 2 phases were only used as the patients were not post-operative patients. Frozen shoulder is a common condition which is seen in 2-5% of the general population. It is a condition which affects the range of motion of the patients in Frozen Shoulder. Although PSRP is being used to treat Frozen shoulder and other shoulder related problems but no study has been done yet to find its efficacy as compared to conventional physiotherapy methods.32 subjects were chosen based on the inclusion criteria and started on the PSRP treatment.
Methods: Each subject was taught the exercises and given 10 repetitions with a hold.
of 10 secs. Each patient was treated for at least 45 mins. The ranges and VAS of the patients was taken before and after the treatment on the 2nd week, 4th week and 6th week.
Analysis: The data was analyzed using Primer software with a level of significance $p<0.05$ and ANOVA.
Results: The results show that there was a gradual decrease in the pain over the 6 week program whereas, there was a gradual rise in the ranges with $p<0.05$.
Conclusion: PSRP has a significant effect on increasing the ranges of the patients with frozen shoulder.
Implications: PSRP can be given to improve the condition of patients having frozen shoulder.

Keywords: Frozen shoulder, PSRP, VAS, ROM.

AB No 56: A study on aerobic capacity and generalised fatigability in young adults with Forward Head Posture: A pilot study

Authors: Kumkum, Kshitija Bansal.
Affiliation: Amar Jyoti Institute of Physiotherapy, University of Delhi

http://doi.org/10.18231/j.jsip.2019.014

Purpose: To study the Aerobic capacity and Generalized Fatigability during Daily activity in Young Adults with Forward Head Posture (FHP)
Relevance: FHP is becoming one of the most common postural faults amongst the young adults due to their lifestyles and working habits. Literature exists on correlation between forward head posture and cardiorespiratory function. Reduced aerobic capacity have relation with generalized fatigability. General fatigue and exertion can lead to decreased quality of life. There is no literature available so far about the impact of FHP on fatigue levels. It is necessary to find out whether it impact fatigue felt by the individual during daily activity. 26 young adults of age between 18-25years of age with FHP (CVA less than 53 degrees) were recruited in the study. Further, adult suffering with congenital deformities in the neck and thoracic cage, diagnosed respiratory condition, lung surgery, injury to cervical column in last 6 months, diagnosed neurological problem affecting cervical and thoracic spine, Hypothyroidism and clinical depression were excluded from study.
Methods: All the subjects assessed for forward head posture by CVA measurement through UTHSCSA software, aerobic capacity (Vo2 Max) by the Queens college step test. Later the individuals will be assessed for their general fatigue by Fatigue assessment scale (FAS).
Analysis: The data was analysed by SPSS version 16.0 With Descriptive statistics
Results: The study was conducted on 26 young adults (M=5, F=21) with mean age of 21.50 ±1.58 years and mean BMI of 22.56±3.22 kg/m 2. The mean VO2 max for female and male were 40.34±2.84 and 53.20± 4.69 respectively. Out of total participants 80.95% of females had average level of Vo2 max but 60% of Males had good Vo2 max. Around 30.76% of all participants were suffering from mild to moderate fatigability.
Conclusion: The young adults with FHP have lower value of VO2 max and suffer with mild general fatigability during daily activity.
Implications: The results of this study will be beneficial to make a strategy to treat FHP focusing on improving aerobic capacity and General. This in turn will have positive effect on improving overall quality of life.

Keywords: Forward head posture (FHP), Aerobic capacity, Generalized fatigability.

AB No 78: Nomophobia among Physiotherapy Interns and its correlation with De- Quervain Tenosynovitis.

Authors: Gaurang Baxi, Amruta Khade, Tushar Palekar, Soumik Basu, Seema Saini and Divya Gohil.
Affiliation: Dr. D. Y. Patil College of Physiotherapy, Dr. D. Y. Patil Vidyapeeth, Pune, Maharashtra.

http://doi.org/10.18231/j.jsip.2019.015

Purpose: Nomophobia (No mobile phone phobia), is the fear of being out of mobile phone contact. This study explores physiotherapy interns' perception towards nomophobia and compares it with objective data on actual cell phone usage. Prevalence of De-Quervain's Tenosynovitis among interns is explored and correlated with nomophobia.
Relevance: Many clinical conditions seen nowadays are because of addiction to technology, such as Text Claw, Cell Phone Elbow, Text Neck, De-Quervain's Syndrome. Physiotherapy students should be aware of these, as the younger generation is more prone to extensive use of

smartphones. The study was conducted for a batch of 100 interns at a Physiotherapy College.

Methods: Ethical approval was obtained from the institutional sub-ethics committee. After informed consent, Physiotherapy interns were asked to fill the nomophobia questionnaire (NMP-Q). 'APPS tracker' was installed in cell phones of all participants, which calculated daily, weekly and monthly number of hours and number of times smartphone is used. Top 3 applications used throughout the month are also shown. Finkelstein test was used to diagnose De-Quervain tenosynovitis.

Analysis: Data collected was analysed for cell phone use and correlated with De-Quervain's Syndrome.

Results: 26% interns had mild, 64% had moderate and 10% had severe nomophobia. 19% interns had De-Quervain tenosynovitis. All interns having severe nomophobia were having De-Quervain tenosynovitis. WhatsApp, Facebook and Snapchat were the commonest used apps

Conclusion: All interns in the group had some form of nomophobia, with a significant number having De-Quervain tenosynovitis. Though this was a single centre study, future scope includes studies to better understand the texting techniques and connection to muscle activity and kinematics.

Implications: It is important to identify and help students with nomophobia make appropriate behavioural changes to avoid long term impairments.

Keywords: Nomophobia, De-Quervain's syndrome, Repetitive Stress Injury.

Platform Presentation Abstracts

Day-II Session: Physiotherapy in Cardiopulmonary, Gynaecological Conditions, Education
Saturday, February 16, 2019

AB No 8: Effect of balance training during pulmonary rehabilitation for individuals with chronic obstructive pulmonary disease

Authors: Disha Garg[1], Shambhovi Mitra[2] and Man Mohan Puri[3]

Affiliation: [1,2]Indian spinal injuries centre, [3]National Institute of Tuberculosis and Respiratory Disease

http://doi.org/10.18231/j.jsip.2019.016

Purpose: Postural instability is an important issue increasingly recognized as a complication in chronic obstructive pulmonary disease (COPD). This study aimed to evaluating the effect of specific balance training as part of Pulmonary Rehabilitation (PR) on balance, postural control, functional capacity and quality of life in individuals with COPD.

Methods: 23 stable moderate and sever COPD patients were randomly assigned to experimental and control group after meeting the inclusion criteria. Both groups received standard of care PR, where experimental group also received balance training. Exercise training was given for 20 session 3 times a week in which 2 were supervised and 1 was prescribed session. Baseline variables for balance were measured using Berg balance scale (BBS), Brief- Balance evaluation systems test (Brief- BESTest) and sway meter was used to assess the postural control. Functional capacity was assessed using six minute walk test (6MWT) and St. George Respiratory Questionnaire for COPD (SGRQ-C) was used to assess the quality of life.

Results: After completing 20 sessions, there was observed significant between group difference for BBS, Brief-BESTest and Medio-lateral postural sway with eyes closed ($p<0.05$).

Conclusion: Specific balance training can be safely incorporated into existing pulmonary rehabilitation program which confers benefits in objective measures of balance and postural sway.

Keywords: Balance training, Berg balance scale, Brief-BESTest, COPD, Pulmonary Rehabilitation.

AB No 26: Effectiveness of fartlek training on body composition and lipid levels among young adults: a randomized control trial.

Authors: Mansi Shingala and Yagna Shukla

Affiliation: Govt. Physiotherapy College – Jamnagar, Ahmedabad

http://doi.org/10.18231/j.jsip.2019.017

Purpose: Physical inactivity is an important public health issue and is the seventh most prevalent risk factor for cardiovascular disease globally. According to WHO, in developing countries, almost half of the adult population does not accumulate enough physical activity for health benefits. The variable intensity and continuous nature of the Fartlek exercise places stress on both the aerobic and anaerobic systems. Fartlek training is majorly used for athletic population. Evidences are still lacking for the role of Fartlek training among non-athletic young population. So, this study will help to find out the role of the Fartlek training among young adults.

Relevance: Because of busy pace of modern life, one can't get sufficient time for regular exercises. In that case, Fartlek training programme is very helpful as it requires less time and is very flexible in nature to perform the exercises as one wish.

Participants: 32 Young adults with the age group of 20-30 yrs, both male and female, who were willing to participate, ready according to Get active questionnaire and who were not on any medication were included for the study.

Methods: Participants were divided in study and control groups. Body composition and Lipid levels were evaluated before starting the training and after completion of 6 weeks of training.

Analysis: T- test was applied to evaluate the outcome measures for analysing statistical significance.

Results: Body composition and Lipid levels were significantly improved in Fartlek training group ($p <0.05$).

Conclusion: Fartlek training is statistically significantly effective for improving Body composition and Lipid levels. Future study can be done by using other outcome measures.
Implications: Fartlek training can be used for exercise training for improving Lipid levels and Body composition among young adults.

Keywords: Fartlek training, Body composition, Lipid levels.

AB No 39: The role of physiotherapist in improving forearm vessel diameter using restricted blood flow training pre-operatively in patients with chronic kidney disease (CKD) in need of Arteriovenous fistula (AVF).
Authors: Ananya Sharma, Ruth Boyle
Affiliation: Ramaiah Medical College

http://doi.org/10.18231/j.jsip.2019.018

Purpose: The number of CKD patients in need for Arteriovenous fistula (AVF) as an access for hemodialysis is increasing. Maturation of AVF still remains as a barrier to successful use of AVF for dialysis. Exercises using blood flow restriction (BFR) can promote the necessary vessel dilatation before its creation, thereby facilitating the maturation process, preventing complication and prolonging the use. As venous diameter is one of the prime predictors of maturation of the fistula, physical therapist need to be aware of protocols, techniques and safety guidelines that can increase the diameter pre-operatively.
Relevance: As a rationale to provide rehabilitation pre-operatively for patients undergoing AVF. A narrative review could provide different protocols and their effects to help a therapist improve vessel diameter that could aid in faster maturation and reduced failure rates of AVF.
Participants: No participants, Narrative Review
Methods: PubMed, Research Gate and Google Scholar were searched till November 2018.
Analysis: Descriptive analysis
Results: The patients showed significant improvement in radial artery diameter, forearm circumference, hand grip strength and venous diameter.
Conclusion: Physical therapist can play a vital role in improving the vessel diameter and the maturation of AVF in a CKD patient. Future research in the area of restricted blood flow training is required.
Implications: As CKD cases are increasing, and the need for AVF, physiotherapist should be sensitized about their role in improving the outcomes of the surgery.

Keywords: Chronic kidney disease, Arterial venous fistula, Restricted blood flow training.

AB No 48: Analysis of predictors of six minute walk test after total knee replacement in Indian population.
Authors: P. Antony Leo Aseer[1], Arun G Maiya[2]
Affiliation: [1]Sri Ramachandra Institute of Higher education and Research; [2]Manipal Academy of Higher Education.

http://doi.org/10.18231/j.jsip.2019.019

Purpose: The broad aim is to analyze the clinical variables predicting six minute walk (6MWT) after Total Knee Replacement (TKR) in Indian population.
Relevance: The study predicts a predictor model to calculate six minute walk distance (6MWD) following TKR.
Participants: 101 subjects who underwent unilateral total knee replacement for degenerative joint disease with posterior stabilized knee prosthesis without patellar resurfacing were included.
Methods: Retrospective analysis of data from a randomized controlled trial. All subjects received structured TKR rehabilitation program. Clinical variables of knee flexion mobility in degrees, isometric muscle strength of quadriceps in kilograms, functional outcome of Knee Osteoarthritis Outcome Survey (KOOS) and 6MWT at 3 months following TKR were collected and analyzed.
Analysis: Stepwise multiple regression analysis was used to analyze the interaction between variables in predicting 6MWT.
Results: The strong predictors of 6MWT are knee flexion mobility, isometric quadriceps muscle strength and pain perception in a functional scale ($r = 0.75$, $p < 0.001$) at three months following TKR. The predictors identified explained 75% of the variance in six minute walk distance.
Conclusion: The derived predictor model of six minute walk distance in TKR in specific to Indian population requires the key physiological variables of quadriceps muscle strength, knee joint flexion mobility and pain perception using a functional scale. This model may be evaluated for its applicability and validity in clinical set up.
Implications: The derived predictor model can be applicable at all clinical setups practicing TKR rehabilitation as the predictors are readily measured, cost effective and predicts the functional capacity (6MWD) at 3 months following TKR.
Keywords: Total knee replacement, Six minute walk test, Predictors.

AB No 110: Impact of adherence to home-based exercises on functional outcomes and quality of life in pulmonary arterial hypertension: Results from a randomized controlled trial
Authors: Abraham Samuel Babu[1], Arun G. Maiya[1], Ramachandran Padmakumar[2]
Affiliation: [1]Department of Physiotherapy, School of Allied Health Sciences, Manipal Academy of Higher Education, Manipal; [2]Department of Cardiology, Kasturba Medical College, Manipal Academy of Higher Education, Manipal.

http://doi.org/10.18231/j.jsip.2019.020

Purpose: Most exercise recommendations require 3-5 days of exercise participation. However, there are no studies that

have assessed the impact of number of days exercised and its impact on functional outcomes in patients undergoing home-based cardiac rehabilitation across various diseases, especially in pulmonary arterial hypertension (PAH). The aim of this study was therefore to understand the impact of adherence on functional capacity and quality of life in PAH.
Relevance: PAH is a condition with great morbidity and great burden in India, often underdiagnosed. The use of simple home-based exercise training offer an alternate method of participation in cardiac rehabilitation
Participants: 34 participants completed a randomized controlled trial which recruited 84 participants (42 in each group) with PAH and tricuspid regurgitant velocity > 3.4m/s ± RV dysfunction. Patients were excluded if they had acute myocardial infarction, acute pulmonary embolism, unstable arrhythmia, unstable PAH, acute renal failure, severe neurological or orthopaedic problems limiting rehabilitation, patients on long term oxygen therapy or those receiving continuous positive airway pressure (CPAP) at home.
Methods: Participants were randomly allocated to receive a 12-week home-based exercise training or standard care. Those who received home-based exercise training were given an exercise log book and it was used to measure adherence to the program. At the end of 12 weeks, 32 completed the study with no significant adverse events.
Analysis: Demographics were represented using descriptive statistics. ANCOVA was run to determine the effects of various adherence levels on functional outcomes and quality of life.
Results: Adherence to the exercise program was average (45.2% ± 15.9%) in this study. When divided into tertiles (<40%, 40-60% and >60%), most of the participants (n=25) completed between 40 and 60% of all exercise sessions, while only three and five completed <40 and >60% of sessions respectively. Maximum improvements in functional capacity (74m) and quality of life (4.8 and 8.3 units for physical – PCS and mental components - MCS) were observed with adherence >60%. Those finishing <40% achieved improvements of 56.6m and 4.7 and 6.9 units for PCS and MCS respectively.
Conclusion: Completion of even 40% of exercise sessions improves functional capacity and quality of life among patients with PAH participating in a home-based exercise program.
Implications: Therapists can encourage patients to achieve at least 40% adherence to produce some benefit, though achieving >60% adherence should be the target.

Keywords: Cardiac rehabilitation, Pulmonary hypertension, Exercise, Function, Quality of life.

AB No 49: Referrals to physiotherapy interventions for women with urinary incontinence: unraveling the potential.

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http://doi.org/10.18231/j.jsip.2019.021

Purpose & Relevance: Worldwide, urinary incontinence is a common but under reported health condition, especially among women. Data from various studies in Indian women suggest prevalence between 19% and 46%. International Consultation on Incontinence (2018) recommends physiotherapy interventions as one of the first line of management. Data from an 800 bedded tertiary care medical college hospital suggest limited utilization of physiotherapy services for incontinence (one referral/month). Multiple barriers exist and needs a unified health systems approach to improve access to care. The present study, using hospital outpatient data, aimed to determine the potential for referrals to physiotherapy for management of Urinary Incontinence. The results of the study could assist in improving access to physiotherapy services for women with urinary incontinence
Participants: Women above the age of 18 years and visiting any of the OPDs of the hospital were considered eligible to be included in the analysis.
Methods & Analysis: Using a retrospective design, the study analyzed hospital out-patient statistics for a three-month period. After due administrative permission, details of adult women visiting the OPDs were obtained from the hospital IT department and categorized as those from all departments, high potential departments (Urology & OBG) and Physiotherapy. Using national prevalence studies, potential burden of urinary incontinence among the women visiting the OPDs was estimated and a projection for potential for referral was made.
Results: During the three-month period, a total of 26546, 5371 and 271 adult women (36±21 years) visited OPDs of all departments, high potential departments and physiotherapy department respectively. If there existed a clinical care pathway to screen for urinary incontinence among all adult women visiting the hospital; even at a conservative estimate of 15% prevalence of urinary incontinence, about 3981, 805 and 40 women from all departments, high potential departments and physiotherapy department respectively could have been identified to have had incontinence. Within the context of high potential departments and physiotherapy department, this would amount to an increase of over 250 and 13 times respectively from current referral patterns.
Conclusion: There is an extensive gap between potential for referrals and current practice. Creating awareness about the potential among the key stake holders is recommended.
Implications: There is a strong need for developing and implementing appropriate clinical care pathways in high potential departments to improve access to physiotherapy services for incontinence.

Keywords: Clinical pathways, Urinary incontinence, Pelvic floor exercise

AB No 38: A study of students' perception of reflection in learning.

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Affiliation: Ramaiah Medical College, Bangalore.

http://doi.org/10.18231/j.jsip.2019.022

Purpose: Reflection is an active learning process which is considered to enhance decision making, critical thinking skills and empathy in healthcare professionals. In many Western universities, reflection is a module in itself. Indian Physiotherapy curriculum mandates the students to only maintain log books of the patients seen, but does not require an in-depth analysis. Hence, the present study was undertaken to introduce students to reflection and assess their perception of reflection in learning.
Relevance: Introduction of reflection at an undergraduate level may improve clinical reasoning and critical thinking, hereby making students better independent practitioners.
Participants: 27 Physiotherapy interns. Methods: An informed consent was taken from the participants. A formal class on reflection was conducted. The participants were given a template to write their reflective work on any two cases in their clinical postings. On submission of the reflection after 3 weeks, the students' perception was assessed with a validated Perception of Reflection questionnaire (Chong 2009).
Analysis: Data was analysed in a descriptive manner using Microsoft Excel. The scores obtained were on 5point Likert scale. The scores of "Agree" and "Strongly Agree" were combined and considered as Agree and scores of "Disagree" and "Strongly Disagree" were considered as Disagree to make the data more meaningful.
Results: 23 students submitted the reflection essay. The results showed that all students perceived reflection activity as useful and helps in decision making and reviewing experiences. Time was not perceived as barrier. The students felt that faculty assistance was needed to achieve more critical levels of reflection.
Conclusion: Overall the students had a positive view on using reflection as a method for learning.
Implications: Reflection can be considered as a teaching module for undergraduate students to improve their clinical learning.

Keywords: Reflection, Physiotherapy, Perception.

Platform/Poster Presentation Abstracts

Day-II Session: Physiotherapy in Neurological Conditions
Saturday, February 16, 2019

AB No 96: Immediate influence of Anodal tDCS on paretic lower limb muscle activity in stroke survivors: A preliminary study

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http://doi.org/10.18231/j.jsip.2019.023

Purpose: Hemiparesis following stroke is the major factor limiting locomotor abilities. Improving motor ability through neuroplasticity is a key factor for recovery. Transcranial direct current stimulation (tDCS) is a non-invasive, neuromodulation technique but its use for improving lower limb motor recovery is less explored. Hence, we aimed to evaluate the immediate effect of anodal tDCS over lesioned hemisphere on paretic lower extremity muscle activity in stroke survivors.
Relevance: Understanding the change in muscle activity will help us determine its value to be used as an adjunct therapy in addition to other rehabilitative approaches.
Method: 10 stroke survivors with hemiparesis in subacute and chronic phase were recruited. A single session anodal tDCS was given with an intensity of 1mA for duration of 15 minutes. The active electrode was placed on the lesion side over the scalp representing lower limb region. Muscle activity was recorded from rectus femoris, biceps femoris, tibialis anterior and medial gastrocnemius of the paretic lower limb pre and post stimulation using EMG.
Analysis: Root mean square values of the respective muscles were taken for analysis. Paired t test was performed to analyze the change in amplitude of EMG signal.
Results: EMG waveforms appeared to be greater in amplitude. It appeared that there was increase in force production (25% on average) of above muscles following tDCS. Patients reported that they felt better after tDCS in context that it was easier for them to do paretic lower limb movement after intervention. No adverse effects were observed.
Conclusion: tDCS appears to induce better muscle activation in paretic lower limb muscles in patients with hemiparesis following stroke in safe manner.
Implications: It could be used as an adjuvant therapy in recovery enhancing approaches of rehabilitation to facilitate muscle performance of lower limb in stroke survivors in acute and chronic stroke settings. KEYWORDS: neuromodulation, Electromyography, hemiparesis.

AB No 15: Efficacy of combined mirror therapy with conventional therapy in pain, edema and functional outcomes in post-stroke shoulder hand syndrome: A randomized controlled trial

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http://doi.org/10.18231/j.jsip.2019.024

Purpose: To compare the efficacy of Mirror therapy combined with conventional therapy in people with Shoulder Hand Syndrome after one year of middle cerebral artery stroke.

Participants: 34 post-stroke Shoulder Hand Syndrome patients were selected on the basis of inclusion and exclusion criteria. 32 patients provided written informed consent and were randomly divided into two groups; group A control group (n=16) and group B experimental group (n=16).
Method: Both groups received 4-weeks conventional stroke rehabilitation program 5 day/week for 30 minutes daily. Group B received the same conventional program in the form of mirror therapy. All patients were evaluated before and after 4-weeks treatment for edema, pain intensity and functional activities of the affected upper extremity. The outcome measures were edema measurement chart, 0-10 numeric pain rating scale and functional independence measure scale. Follow up was done 2 weeks after completion of intervention.
Analysis: Unpaired "t" test was used to compare edema measurement, pain intensity and functional activities between the two groups; pre and post intervention and at follow up.
Results: Statistically significant differences were found for edema measurement (Mean difference was 1.40 cm, $p<0.05$), pain intensity (Mean difference = 0.87, $p<0.05$) and functional activities (Mean difference = 12.20, $p<0.05$). During follow up, these statistically significant differences were maintained for edema and functional activities but not for pain.
Conclusion: This study demonstrates that patients with post stroke shoulder hand syndrome, treated with mirror therapy as compared to conventional physiotherapy provides greater improvement in edema, pain and functional activities.
Implications: Mirror therapy is a non-invasive, inexpensive and easily applicable rehabilitation method in a clinical set up with no significant complications. It provides a central component to rehabilitation programs by using visual, somatosensory and proprioceptive stimuli to yield better effectiveness in patients with post-stroke shoulder hand syndrome.

Keywords: Mirror therapy, Shoulder hand syndrome, Edema, Pain, Functional activities, Upper limb post stroke treatment.

AB No 72: Efficacy of craniosacral therapy on cognitive function in patients with chronic head injury: A pre-post design

Authors: Swikruti Singh, Narkeesh Arumugam, Divya Midha
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http://doi.org/10.18231/j.jsip.2019.025

Purpose: Head Injury is the leading condition of morbidity, disability, mortality and socioeconomic losses across the globe. It presents the constellation of symptoms such as altered consciousness, headache and vertigo, cognitive and perceptual deficits. Although cognition is the prerequisite for recovery in head injury, craniosacral therapy enables smooth CSF flow and suture correction by improving cognition. Present study has been conducted to find out the efficacy of craniosacral therapy to enhance the cognitive function in chronic head injury patient.
Relevance: The study has been conducted to examine the efficacy of craniosacral therapy in cognition in patients with chronic head injury.
Method: 04 subjects of chronic head injury having ability to walk independently with or without a walking aid and RLA score of 6 and 7 were included in the study. They were allocated to a single group. Participants received craniosacral therapy along with conventional treatment, 2 sessions / week for 35 minutes for total 8 weeks.
Analysis: Outcome measures included were Mini Mental State Examination (MMSE) and Cognistat which were assess for before, and after the intervention.
Result: Statistical analysis revealed significant results for Cognistat with p value 0.015 and non- significant results for MMSE with p value 0.21.
Conclusion: Although the statistically results were non-significant but clinically improvement were observed in the subjects. Future randomized control studies incorporating large sample would provide insight into the effectiveness and clinical relevance of craniosacral therapy on cognition in chronic head injury subjects.

Keywords: Head injury, Craniosacral therapy, Cognition, MMSE, Cognistat.

AB No 114: Correlation between 6 minute push test and 4 functional tasks in individuals with spinal cord injury

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http://doi.org/10.18231/j.jsip.2019.026

Purpose: to find the correlation between 6 minute push test (6MPT) and 4 Functional Tasks (4FT) for measuring the functional capacity in Spinal Cord Injury (SCI) Patients. These 2 outcome measures are used to assess and monitor physical therapy problems for wheelchair bound patients with SCI.
Relevance: No studies have been conducted yet to find the relationship between 6MPT and 4FT in individuals with SCI.
Participants: 50 subjects with both male and female aged 18-70 years, medically diagnosed with traumatic or non-traumatic below d6 level of SCI having ASIA A or B and ability to self-propel a manual wheelchair were selected for the study.
Methods: After taking written consent, all the patients were asked to perform 6MPT and 4 FT (forward wheeling, ramp ascent, vertical reach and one stroke push) and the data was recorded.
Analysis: Statistical analysis was done using SPSS version 16.0. Data analysis was done to correlate the distance of 6 minute push test and four functional tasks.

Results: The study showed highly significant correlation between 6MPT And 4FT; Positive correlation between distance of 6mpt with time and distance of 4 functional tasks.
Conclusion: This study concludes that there is a highly significant correlation between 6MPT and 4FT
Implications: 6 minute push test signifies the functional capacity of an individual propelling with wheelchair and the 4 functional tasks signifies the functional mobility of an individual on different aspects. Thus, by finding the relationship between the two, we can clinically yield better outcomes for the physical health of individuals with SCI.

Keywords: Six minute push test, Four functional tasks, Spinal cord injury.

AB No 116: Role of cerebral dominance in cognitive functions among school going children

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http://doi.org/10.18231/j.jsip.2019.027

Purpose: The cerebral dominance and laterality is explained in terms that the brain controls the body by dividing work. The left hemisphere controls the right side and right hemisphere controls the left side of body. Cognition is the method used by central nervous system to process awareness, reasoning, judgment, intuition, perception and memory. As cognitive skills develop with the advancing age, Present study based on the role of laterality cognitive functions and their impact on general being.
Relevance: To determine the role of cerebral dominance in cognitive function among school going children.
Methods: The total 100 children with the age group from 7-12 years of certain schools of Indore, were selected. Outcome measures such as Edinburgh Hand Inventory for determining the handedness, Montreal Cognitive Assessment (for cognitive Functions), Brain dominance questionnaire (Cerebral Dominance) and CPM (Coloured Progressive Matrices) were used in the study.
Result: Negative correlation (r= -0.225) was found between Brain Dominance and IQ, between. Brain Dominance and Cognition (r= -0.376), however positive correlation was observed between IQ and Cognitive functions (r=0.665).
Conclusion: The present study concluded that the brain dominance has no correlation with cognition than IQ level and left dominant school going children has more cognitive ability than right brain dominat children

Keywords: Cerebral dominance, Handedness, Cognitive ability, IQ, School going children.

AB No 2: The effect of rhythmic auditory cueing on functional gait performance in parkinson's disease patients.

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http://doi.org/10.18231/j.jsip.2019.028

Purpose: Parkinson's disease is a progressive neurological movement disorder. Gait and its related dysfunctions cause a lot of disability to the patient. The common objective for all therapeutic intervention aims to preserve a patient's independence and quality of life. There are established benefits of exercises to maintain functional independence including gait, prevent falls and decrease disease progression. External cueing such as rhythmic auditory cueing is a strategy that can be used in adjunct with traditional gait training intervention to facilitate movement, gait initiation and continuation. The external auditory cue training rerouted the movement through a non- automatic pathway, removing it from automatic basal ganglia pathway. There has been some evidence which suggests the positive effect of application of rhythmic auditory cueing on gait and balance performance of Parkinson's patient, but it still remains ambiguous, hence, this study is planned to gather more evidence, on the effect of external auditory cues on gait performance in Parkinson's disease patients.
Relevance: To assess and compare the effect of conventional rehabilitation exercises combined with rhythmic auditory cueing and conventional rehabilitation exercises on functional gait performance using freezing of gait questionnaire(FOGQ), modified gait efficacy scale(MGES) and figure of eight walk test(FO8WT) in Parkinson's disease patients.
Participants: 84 Parkinson's disease patients (42 experimental group, 42 control group) of age group (64.23+5.04) involved voluntarily. Participants with Grade 2 and Grade 3 of Parkinson's disease on Hoehn and Yahr classification, which all were having score > 24 on mini-mental state examination and ambulated independently indoors without aid were included in a study. They were tested for FOGQ, MGES, FO8WT.
Methods: Prospective randomized controlled trial. Sampling technique- simple random sampling.
Analysis: Normality test: Shapiro Wilk test. Parametric test: Paired and Unpaired t-test.Nonparametric test- Wilcoxon Signed Rank Test and Wilcoxon Sum Rank Test.
Results: The study results show that there is a significant improvement in functional gait performance in Parkinson's disease patients after auditory cueing reflected by the significant p values of respective tests. Improvement in functional gait performance seen after 5 weeks.
Conclusion: The above study concludes that application of rhythmic auditory cueing has beneficial effects on the functional gait performance primarily on freezing of gait, modified gait efficacy scale and the time component of figure of eight walk test in Parkinson's disease patients.

Implication: It is a simple clinical technique that can be used in almost all types of clinical settings. The use of metronomes in movement rehabilitation often happens without a formal protocol, simply by adding the pacing sound to whichever movement needs practice.

Keywords: Functional gait performance, Parkinson's disease, Rhythmic auditory cueing, Freezing of gait.

AB No 9: The effect of strengthening the ankle musculature on balance in elderly using EMG biofeedback versus conventional method.

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http://doi.org/10.18231/j.jsip.2019.029

Purpose: To evaluate the differential effects of two types of strengthening techniques, EMG biofeedback versus a Conventional training technique on the strength of the ankle musculature and balance in the elderly.
Relevance: EMG biofeedback in strengthening Ankle musculature and on balance can determine an effective and new strategy for improving balance and falls prevention in geriatric population.
Participants: 40 community dwelling elderly participants were recruited by convenience sampling. The inclusion criteria were male and female aged 60 and above with or without history of falls, ambulatory with or without assistive device, MMSE score $\geq$ 24. Subjects having uncontrolled hypertension/ diabetes, active inflammatory disease, neurological disorder, uncorrected visual disparity, ear disorders, joint pain, fracture, terminal illness, cardiopulmonary diseases were excluded.
Method: A two group, pre-test post-test (mixed – group x repeated measures) experimental study design, participants were randomly assigned to a conventional (Thera band training) and experimental group (EMG Biofeedback + Thera band). The patients were treated for 30 minutes per day thrice a week, for 6 weeks. They were assessed on Functional Reach Test, Berg Balance Scale, and Strength using strain gauge, pre and post intervention.
Analysis: The data was analyzed through Repeated Measure ANOVA.
Results: There was a significant improvement in strength of the ankle musculature and balance following exercises in both the group. However, balance as measured by the berg balance scale was significantly better following EMG biofeedback training compared to conventional exercise training.
Conclusion: EMG Biofeedback training in addition to strengthening exercises has significant beneficial effects on balance of community living elderly.
Implication: EMG training would be effective measure of improving balance in elderly, this in turn will have a great impact on overall quality of life in geriatric population.

Keywords: EMG biofeedback, Ankle musculature strength, Balance, Elderly.

Platform Presentation Abstracts

Day-III Session: Physiotherapy in Musculoskeletal Conditions
Sunday, February 17, 2019

AB No 4: Pre-activity screening practices and emergency preparedness in gymnasium/ fitness centers in Udupi Taluk: A survey

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http://doi.org/10.18231/j.jsip.2019.030

Purpose: The benefits of physical activity (PA) in the prevention of various diseases are undeniable now. However, there are well-known complications arising during the PA. Although it cannot be completely prevented, a thorough pre-activity screening may help in reducing these risks. Recently, the number of people are exercising in Gymnasium or fitness centers (GFC). We aimed to explore the current practice patterns of pre-activity screening and emergency preparedness in GFC in Udupi Taluk.
Relevance: After the long-term rehabilitation in rehabilitation centers, clients are generally advised to continue the exercises at home or in local GFC. It is important that these centers are safe for the clients. Participants 31 In-charges of GFC in Udupi Taluk. A list of GFC was obtained from the local bodybuilding association.
Methods: Informed consent was obtained, and the purpose of the study was explained to the participant. A questionnaire was administered to the in-charges of GFC.
Analysis: Descriptive statistics were used.
Results : 31/35 GFC consented to participate. Median experience of the participants was 7 (5, 10) years. Clients in each GFC ranged between 9 -150. Educational qualification of the participants ranged from basic certificate course to postgraduate degree. 23/30 participants were not aware of any validated screening procedure. However, 12/31 answered that they performed informal screening by asking questions about health. Only 2/27 were trained to provide CPR. When a scenario of client collapsing during exercise was asked, 16/31 answered that they would call a doctor.
Conclusion: Results from the study indicate the low level of awareness and implementation of available recommendations to improve safety during exercise in GFC. Future studies can look at the uptake of the awareness program.
Implications: The awareness of pre-activity screening should be improved, and a policy should exist to handle emergencies.

AB No 64: Long term effectiveness of structured exercises program without electro-modalities for improving quality of life in patients with lumbar disc lesion.

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http://doi.org/10.18231/j.jsip.2019.031

Purpose: Identify long term effectiveness of structured exercises in improving quality of life(QoL) in patients with lumbar disc lesion.
Relevance: Emphasizing physiotherapist supervised exercises and not electro-modalities in clinical practice for lumbar disc lesion. 97-patients with lumbar disc lesion were included.
Methods: Retrospective Study. Pre-treatment QoL was taken on Quebec Pain Disability Scale (QPDS) on first day. Each patient was given 60-minutes of structured back-care exercise program without any electro-modalities by a qualified Physiotherapist. Telephonic interviews of patients discharged with zero-pain on Numerical Pain Rating Scale before 1-year and above, were assessed for long-term effectiveness of exercises by QPDS (follow-up).
Analysis: Paired T-Test was used to compare Pre/follow-up scores. Repeated Measures ANCOVA was done to compare treatment days, duration of discharge and continuity of exercise after discharge on Pre/follow-up scores.
Results: There was significant difference in Pre-treatment (m=61.49, SD=9.045) and follow-up (m=3.26, SD=8.045); (t=59.55, p=0.00). Days of treatment compared with Pre/follow-up mean difference (MD) score identified no significant difference; upto-15 days MD=58.38, 16to20-days MD=53.84, >30-days MD=49.78. Comparison of duration of discharge stated significant changes in Pre/follow-up MD scores; 1-year MD=61.43; 1to2-years MD=52.44; 3- years MD=49.70. Further, continuity of exercise showed no significant differences; who continued exercises, MD=55.98, who didn't continued exercises, MD=54.08, who did exercises occasionally, MD=45.58.
Conclusion: Exercises were effective and showed significant difference in pre/follow-up scores. Long term effectiveness of exercises was proved when pre/follow-up differences remained similar at 1-year and 2-years of discharge. However, patients discharged before 3- years showed non-significant trend of reduced effectiveness. Also, our results suggest that if proper supervised exercise program is completed by a qualified physiotherapist then home-care program might not be important to maintain good QoL for at-least 3-years.
Implications: Only structured and supervised exercises and not electro-modalities should be emphasized in physiotherapy clinical practice to reduce pain and improve long-term QoL for patient with lumbar disc lesion.

Keywords: Lumbar Disc Lesion, Structured exercises, Efficacy.

AB No 77: Effectiveness of static taping on medial collateral ligament sprain of knee in sports person.

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http://doi.org/10.18231/j.jsip.2019.032

Purpose: There are many modalities and techniques in Physiotherapy for Knee Conditions, still in many a times pain persist due to lack of stability. Taping is frequently used in the field of rehabilitation as a means of treatment of knee. McConnell taping also known as Rigid Taping has been used in the study. The McConnell Taping is structurally supportive, highly adhesive and can be worn upto 18 hours in a day.
Relevance: McConnell taping has been reported to reduce pain and improve function in people with Patello-Femoral Pain Syndrome and various Knee Conditions during activities of daily living. Participants: Total 30 Subjects, State Level Basketball Players, Volleyball Players and Gymnast, were taken in this study who fulfilled the inclusion criteria which was Special Test, Pain Assessment and Balance Test.
Methods: Pre-Post Experimental Study was done at Dr. D. Y Patil College OF Physiotherapy OPD,Pune. The sportsperson were treated with Cryokinetics and Rigid Brown Tape for the pain due to medial collateral ligament sprain knee for the past 1 Week. Treatment given for 7 days daily and outcome measure was Y Balance Test and VAS. Convenient Sampling was done.
Analysis: The Quantitative data was analyzed using Primer and Prsim7, summarized using Mean and SD and the Pre and Post values was compared using Paired T Test. Significant improvement was seen in Pain and Balance at end of the study.
Conclusion: The study concluded that Static Taping in medial collateral ligament Sprain of Knee is Effective. Marked and Significant improvement in Pain and Stability was noticed among all the Sports persons.
Implications: Static Taping can be implemented with Conventional Treatment for pain and stability in Sports persons with Joint conditions such as pain and instability and improving Sports performance.

Keywords: McConnell taping, Medial collateral ligament, Sports persons.

AB No 79: Effect of high intensity interval training on aerobic capacity in long distance runners

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http://doi.org/10.18231/j.jsip.2019.033

Purpose: Endurance athletes are often trained with exercises like their sport i.e., low intensity and long duration exercises. However recent studies have shown that in already conditioned athletes, endurance training leads to no

further enhancement in aerobic capacity. Hence, the purpose of this study was to examine the effect of Tabata training, a form High Intensity Interval Training, on aerobic capacity in endurance athletes.
Relevance: Knowledge of various forms of conditioning that are time-saving and interesting for the athlete could apply to a physical therapist treating patients from an athletic background. Participants: Long distance runners within the age group of 18-50 years, who have been training for a minimum of 1 year and with a 10-kilometer run time of 49+-3 minutes were selected for this study. Athletes with any lower limb injuries, known cardiac conditions and those already engaging in high intensity interval training were excluded.
Methods: 50 participants training under one coach were selected and randomly assigned to study and control groups. Their VO2max was tested using the University of Montreal Track Test. The study group received three weeks of HIIT following the Tabata protocol, in addition to their regular training, while the control group continued their regular training. VO2max was tested again at the end of three weeks.
Analysis: Paired t test within and between groups was done.
Results: A significant difference in the VO2max was noted within the study group ($p<0.005$) but there was no significant difference in VO2max between the groups.
Conclusion: HIIT proved beneficial in improving aerobic capacity in long distance runners. A protocol of longer duration maybe used to study further conditioning and sustained effect.
Implications: HIIT can be implemented in various athletic populations as a part of training and rehabilitation.

Keywords: High intensity interval training, Aerobic capacity, Long distance runners.

AB No 42: Evaluation of physical fitness and functional performance in post liver transplant patients.

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http://doi.org/10.18231/j.jsip.2019.034

Purpose: To find the physical fitness and functional performance in post liver transplant patients and to compare it with fitness level of sedentary individuals.
Relevance: Liver disease is one of the common causes of deaths in India, and liver transplantation has become a treatment of choice in case of chronic liver failure. Due to this the physical fitness of liver disease patients is very less, so the relevance of the study is to find out post liver transplant fitness and compare it with sedentary individuals, so as to know the level of fitness in both the groups, and if the fitness is less in liver transplant patients, it will help in determining a post-transplant rehabilitation to improve the quality of life of liver transplant patients. Thirty liver transplant patients (20-30 days of liver transplant) were enrolled in the study. Similarly, 30 sedentary individuals were enrolled in the study by screening them as sedentary through Godin-Shephard Leisure Activity Questionnaire. Participants with more than one month of liver transplant, with multi organ transplant, or any chronic illness were excluded from the study.
Method : After taking the consent from the patients 30 liver transplant patients (20-30 days of liver transplant) were enrolled in the study. Their physical fitness was evaluated by the following outcome measures- Body Composition which include Waist-Hip ratio, BMI, Hand grip muscle strength, Flexibility of hamstring muscle, Aerobic capacity and functional performance was evaluated by squat test and timed supine to stand test. Similarly the physical fitness and functional performance of 30 sedentary individuals, age and gender matched were evaluated and was compared with liver transplant patients.
Analysis: The data was analyzed by SPSS version 16 with descriptive statistics and unpaired t- test.
Results: After the evaluation, Liver transplant patients show a less level of physical fitness in comparison with sedentary individuals, except the waist hip ratio which was significantly not of much difference.
Conclusions: In conclusion, the present findings indicate that physical fitness and functional performance of liver transplant patients is less in comparison with sedentary individual's. So, Liver transplantation combined with a supervised post-surgery exercise program will improve physical fitness, muscle strength, and functional performance in individuals with transplantation.
Implication: The results of the study will be beneficial in knowing the fitness level of post liver transplant patients and will help the physiotherapist in determining a post rehabilitation program for liver transplant patients and aerobic capacity can be improved from starting, to improve the survival rate of liver transplant patients. Further it can also help in formulation of preventive strategies by physiotherapy professional.

Keywords: Physical fitness, Functional performance, Liver transplant.

AB No 52: Prevalence of calf muscle tightness associated with ankle range of motion among sewing machine operators in textile industry in Kurunegala district, Sri Lanka.

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http://doi.org/10.18231/j.jsip.2019.035

Purpose: The objective was to find out the prevalence of calf muscle tightness associated with ankle range of motion of sewing machine operators.
Relevance: Tailoring industry is a vast scale industry employed by many Sri Lankans. In this study calf muscle

tightness and associated restricted dorsiflexion were highly concerned. According to many studies it is discovered that physiotherapy intervention is highly recommended for occupational health. Because this service sector is mainly targeted for work related musculoskeletal injuries and occurrences of such injuries are prominent. Participants: descriptive cross-sectional study on conveniently selected 110 participants who had not undergone ankle and knee surgeries were selected from sewing machine operators in a textile factory in Kurunegala district.

Methods: The calf muscle tightness and range of motion were assessed by the knee to wall test a type of test used for ankle mobility. Operators were assessed through an interviewer-administered questionnaire.

Analysis: Mix method study was done, and data was analyzed using SPSS.

Results: Statistically analyzed data revealed that among participants 83.6% used their right leg as their dominant leg to operate the sewing machine. The workers who used their right leg to operate the machine obtained a knee to wall test average mean value of 20.53cm for their right leg and 21.02cm for their left leg. Respectively, the workers who used their left leg to operate the machine were 21.31cm for their right leg and 22.14cm for their left leg. Drastically the findings showed that only 20 people who worked there for 7-9 hours had ankle pain and 51 workers who worked there for more than 10 hours had not experienced ankle pain.

Conclusion: The results show that they do not have statistically a significant difference in their calf tightness regardless of the dominant leg of machine operation (P=0.5).

Implications: On recommending, conducting a seminar regarding their issues and increase the awareness of physiotherapy is highly recommended as well as relevant authorities should make them aware about the importance of stretching and relaxation. Also educating sewing machine operators on the use of moist heat to relieve pain and finally establishment of ergonomic changes within the work place are concerned mostly.

Keywords: Calf muscle, Tightness, Range of motion.

AB No 45: Improvements in clinical and functional outcomes in osteoarthritic knee patients treated with pneumatic unloading brace and resisted hip and knee exercises

Authors: Arpan Sarma[1], Shriya Kar[2], Shabnam Agarwal[3] Sourov Saha[4], Tanushree Basak[5], Anwesh Pradhan[6]

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http://doi.org/10.18231/j.jsip.2019.036

Purpose: To compare clinical and functional outcomes in OA knee patients with varus (Grade 3&4) treated with either pneumatic unloading brace combined with specific set of hip and knee strengthening exercise or the same set of exercises alone.

Methods: 26 participants were randomly allocated in two groups; Group A (n=11) wore neumatic unloading brace for 3 hours per day and specific knee and hip muscles strengthening exercises for 12 weeks. Group B (n = 15) performed the same exercises as Group A for 12 weeks.

Variables and corresponding outcome measures were: 1. Pain: Visual Analog Scale (VAS) 2. Disability: Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) 3. Quality of Life: Short Form 36. Subscales- Physical function (PF), Role limitation of Physical function (RP), Body pain (BP), General health (GH), Vitality (VT), Social function (SF), Role limitation of emotional function (RE), Mental health (MH) 4. Mobility: Timed Up and Go test (TUG) 5. Lower extremity strength, balance and disability (5 TRCR): Repeated chair rise (5 times)

Analysis: Within group pre and post intervention differences were analyzed using a paired t- test whilst between groups were analyzed with an un-paired t-test ($p< 0.05$).

Results: Post intervention comparisons of mean values of VAS, WOMAC, 5 TRCR and SF-36 were better for Group A as compared to Group B whilst the TUG test score mean value was less for the former. However statistically significant differences ($p < 0.05$) between the measures were achieved for VAS scores and six out of the eight SF-36 subscales tested: PF, RP, BP, GH, VT and MH.

Conclusion: Both sets of intervention were efficacious in the treatment of Knee OA patients with varus. Statistically significant differences may not have been achieved between the groups due to a Type 2 error.

Implications: The efficacy of non-invasive physiotherapeutic interventions for advanced OA of the knee with varus deformity provide patients an alternative to knee replacement surgery.

Keywords: Pneumatic unloading brace, knee OA, Hip exercises, Quadriceps exercises, Varus knee.

Platform Presentation Abstracts

Day-III Session: Physical Activity & Community Based Rehabilitation
Sunday,
February 17, 2019

AB No 1: Perceived versus actual physical activity among university employees- An observational study

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http://doi.org/10.18231/j.jsip.2019.037

Purpose: Physical inactivity is one of the main risk factors for non-communicable diseases and death worldwide. Overestimation of one's own physical is one of reasons of lack of awareness about optimum levels of physical activity

Relevance: The study will help us find out the association between perceived and actual physical activity level in

University employees. This will help educate employees about physical activity, what is actual physical activity and thereby may help physiotherapist bring lifestyle related diseases down.

Participants: A population-based observational study was conducted with 126 university employees.

Methods: Outcome variables were a 5 point subjective Likert scale for a perceived level of physical activity and a pedometer for the actual level of physical activity. More than 10,000 steps/day on pedometer were considered as the cutoff for the active lifestyle.

Analysis: Data was analyzed using SPSS version 16. Descriptive statistics were used to analyze demographics. Chi square test used to analyze the correlation between perceived physical activity level (Likert scale) and actual physical activity level.

Results: Out of total subjects, 86 (68.25%) subjects were inactive, 77 (61.11%) overestimated their physical activity level and only 7 (7.14%) perceived their level of physical activity as inactive.

Conclusion: There was no significant association between Actual and perceived physical activity level among the participants. A substantial number of subjects believed themselves to be more physically active than they really were

Implication: Overestimation of one's physical activity could be because the lack of awareness about optimum levels of physical activity. They may be unaware of potential health risks, and may be unlikely to participate in PA promotion programs. Increasing information about PA health benefits beyond weight control might help encourage behavior change.

Keywords: Physical activity, Perceived, Actual.

AB No: Effect of ankle muscle strength on balance performance and spatiotemporal gait parameters in type II diabetic peripheral neuropathy population in the age group of 45-60 years.

Authors: Prajakta Dingle, Sandhya Wasnik

Affiliation: All India Institute of Physical Medicine and Rehabilitation.

http://doi.org/10.18231/j.jsip.2019.038

Purpose: Diabetic patients with Diabetic peripheral neuropathy (DPN) develop motor dysfunction and which can further deteriorate. It is unclear whether the reduced muscle strength in diabetes mellitus II patients is directly related to motor and sensory nerve dysfunction. The presence of motor deficit secondary to DPN usually is not evaluated and subsequently goes unrecognized. Moreover, Type II Diabetic neuropathy (T2DPN) also causes balance and gait impairments. Several motor mechanisms play a role in balance and gait performance. Balance and gait are complex task, simple tests are not appropriate for comprehensive assessment of patients. To evaluate in a more functional context, various tools of assessment are required to identify the impairments. Hence the need arises to carry out this study.

Relevance: Identifying the main triggering factors of imbalance in T2DPN may prevent the complication inherent to large impact on the independence of an individual on basic daily activities.

Participants: 200 subjects, divided in; Group A-T2DPN and Group B-Non diabetic population. Group A: Subjects with Type II diabetic mellitus, Michigan Neuropathy Screening Instrument (MNSI) test > 8, age group 45-60years, duration > 5year, glycemic control < 200mg/dl, recruited in the study. Group B age matched subjects without diabetes mellitus. Clinical manifestations of musculoskeletal, central/ peripheral neuromuscular disorder, history of diagnosed foot ulcers 6 months before the study, amputation, Cardiac disease, using assistive devices, excluded from study.

Method: Ankle muscles strength (peak torque), assessed using biodex system 4pro. Balance assessment: four step square test, Berg Balance Scale (BBS), Mini BESTest. Spatiotemporal gait parameters: cadence, step length, speed were assessed using Nagasaki et al procedure.

Analysis: Normality test not passed hence, Mann-Whitney U test, Spearmen's correlation.

Results: Comparison: Ankle muscle strength, balance performance and spatiotemporal gait parameters with control group ($p<0.0001$). Correlation: ankle muscle strength with BBS, Mini BESTest, ($r= 0.2$, and $r=0.2$). Ankle muscle strength and cadence ($r= 0.2$).

Conclusion: There is effect of ankle muscle strength on balance performance and spatiotemporal gait parameters in T2DPN.

Implications: Ankle muscle strengthening can be carried out to improve balance performance and spatiotemporal gait parameters.

AB No 51: Impact of adding stair climbing information to a common physical activity questionnaire: A cross-sectional analysis

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http://doi.org/10.18231/j.jsip.2019.039

Purpose & Relevance: Stair climbing is a vigorous intensity physical activity (PA) and is known to favourably influence multiple cardio metabolic risk factors. Despite being a commonly prescribed activity, few physical activity assessment questionnaires include information on stair climbing. This cross-sectional study aimed to identify if adding information on stair climbing to a common epidemiological physical activity questionnaire can affect quantification of overall physical activity. This study would assist in determining the use of stair climbing assessment and quantification of physical activity prescription.

Participants: Faculty and Postgraduate students (18-64 years of age) of six constituent institutions under a medical education foundation were eligible to participate in the study.
Methods: After ethical approval and permission from heads of constituent institutions, 350 participants (for detecting an effect size of 0.15) were randomly selected from 1053 eligible individuals using probability proportionate to size. Consenting participants from the selected individuals were administered global physical activity questionnaire (GPAQ) by trained research staff. Six METs was assigned to stair climbing (based on previous published work of the author) and used in calculating total physical activity in MET.min/week.
Analysis: In addition to descriptive statistics, difference in physical activity (MET.min/week) obtained from GPAQ with and without stair climbing information were compared using paired t-test.
Results: Data from 296 participants (Response rate: 84.5%; 34±10 years of age; 61% women) were analysed. Majority of participants were highly active (63%; PA > 1200 MET.Min/week) and climbed stairs as part of their routine (98%). The difference in total PA with and without information on stair climbing was highly significant (Mean difference: 139±121 MET.Min/week; 95% CI: 125,153; $p < 0.001$). Addition of stair climbing information to GPAQ resulted in reclassification of physical activity category of 11 individuals.
Conclusions: Adding details about stair climbing to an existing epidemiological questionnaire is feasible and makes a significant difference to total physical activity. Implications: Stair climbing being one of the most common suggestions as part of PA promotion, details about its participation and frequency should be included as part of PA assessment.

Keywords: Stair climbing, Physical activity assessment, Metabolic Equivalents of Task.

AB No 25: Comparison of quality of life among urban and rural elderly population by using WHOQOL-BREF scale.

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http://doi.org/10.18231/j.jsip.2019.040

Purpose: Global geriatric population has been on a rise. In India it is projected to rise to about 324 million by the year 2050. In the developing market economies like India QOL is a multidimensional rather than unidirectional concept. It looks into many domains and facets that have an impact on lifestyle. The World Health Organization Quality of Life Group defines quality of life as individual's perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns'. The effects of disease and health interventions on an individual's quality of life can be measured by quality of life assessments. All the aspects of `health status `lifestyle', 'life satisfaction', 'mental state' and 'wellbeing' together reflect the multidimensional nature of quality of life. However, in India, only a few studies have explored geriatric health problems, particularly mental health disorders and quality of life. Considering this background, this mental health study was conducted to examine the different domains of quality of life affected by socio-demographic factors in the geriatric population. Study done by Verma (2008) shows that total QOL in urban area is significantly better than rural. But as per ourassumption, in rural areas, the elderly work till their body permits they experience power, prestige in family and social life and economic independence while in urban areas, the elderly work for certain age limit as per their jobs, after which they suffer from economic insecurity, loss of power leading to low quality of life. So, we are trying to explore the domain in which rural - urban population are lacking and recommend the measures to improve the quality of life.
Relevance: To assess and compare QOL among urban and rural elderly population by using WHOQOL-BREF scale.
Participants: 80 geriatric subjects of aged 65-75 years from rural and urban population in which 20 females and 20 males from rural and 20 females and 20 males from urban areas were selected by snowball sampling method. They were screened for inclusion and exclusion criteria and after that assessed for WHOQOL-BREF to check for the Quality of Life. Data was statistically analyzed.
Methods: Cross-sectional study. Sampling technique- Snowball sampling.
Analysis: Normality test- Shapiro Wilk test. Nonparametric test- Wilcoxon Sum Rank Test.
Results: The study results show that there is a significant difference in Quality of life of rural and urban population with significant p value.
Conclusion: The above study concludes that Overall Quality of life is better in urban than in rural elderly population. The Overall health is better in urban than in rural elderly population. The Quality of Life of rural elderly population was better in physical and psychological domains whereas urban slum elderlywas better in social relationship and environmental domain.
Implication: It is a simple assessment tool that can be used in almost all types of clinical settings to check quality of life elderly population and after knowing the problem areas one can work upon it by organizing camps and by counseling.

Keywords: Quality of life, Urban elderly, Rural elderly.

AB No 6: Should we or should we not? A qualitative analysis of health professionals' opinion about adding stair climbing information to physical activity questionnaires

Authors: Gloria Alva, Pragnya Ravichandran, Sundar Kumar Veluswamy

Affiliation: Ramaiah Medical College.

http://doi.org/10.18231/j.jsip.2019.041

Purpose & Relevance: It is ironical that stair climbing, considered by Jerry Morris as a form of exercise among London bus conductors to propose one of the first links between exercise and heart disease in early 1950s, is not considered as part of assessment in current physical activity questionnaires (PAQ)!! Recent cross-sectional study from our lab demonstrated that adding stair climbing information to an existing epidemiological questionnaire made a significant difference to quantification of physical activity. This study aimed to understand the opinion of health professionals about the need, feasibility, advantages and disadvantages of including stair climbing assessment as part of PAQ. Understanding the opinion of health professionals using PAQ is important to make appropriate recommendations to clinical practice.
Participants: Eight health professionals from departments of physiotherapy and community medicine were shortlisted based on their domain expertise and experience.
Methods & Analysis: Using a content analysis framework, in-depth semi-structured interviews were conducted among health professionals with domain knowledge for this qualitative study. After consent, the interviews were conducted at a mutually convenient time and audio recorded. A research staff received training and performed verbatim transcription of the interviews to MS word for content analysis and themes were derived from the transcription by the investigators.
Results: All participants opined that stair climbing can be beneficial form of PA promotion and seven felt adding information about stair climbing is useful. Advantages reported by participants include capturing all activities of an individual, stair climbing being a part of regular PA and capturing calories burnt in stair climbing. Majority of places not having stairs, less opportunity to climb stairs in urban areas due to presence of elevators, difficulty for individuals with pain/weakness and recall bias were mentioned as limitations. Most suggested adding a question to ascertain if they climb stairs as part of their routine before proceeding to ask about frequency.
Conclusion: Adding Stair climbing information to PA questionnaires is needed but questions about its relevance in large population exist.
Implication: The findings highlight the importance of context in adding stair climbing information to PAQ and needs to be considered in clinical practice.

Keywords: Physical activity, Stair climbing information, Physical activity questionnaire.

AB No 73: Physical activity self-efficacy and its correlation with cardiorespiratory fitness, physical activity levels and sedentary time among urban school going adolescents – A cross sectional analysis

Authors: Rajitha Alva[1], Ridhi Verma[1], Priyanka Malla[1], Shalini Shivananjiah[2], Sundar Kumar Veluswamy[1]

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http://doi.org/10.18231/j.jsip.2019.042

Purpose & Relevance: There is growing concern about reduction in physical activity, increase in sedentary time and obesity among children and adolescents. School health programs are being promoted by our government, but the usually suggested behavior change interventions (BCI) to improve physical behavior have not been tested in our school population. The BCIs are built on the premise that there is relationship between constructs such as self-efficacy with physical activity and sedentary time. This study represents the pre-intervention data of an ongoing RCT and aims to assess the relationship between physical activity self-efficacy with cardiorespiratory fitness (CRF), physical activity levels and sedentary time.
Participants: Students of class 7-9th from three private schools.
Methods & Analysis: Following ethical approval, CTRI registration, school and parent consent, 272 adolescents volunteering to participate in the RCT completed Self-Efficacy for Daily Physical Activity Questionnaire (SEPA), Physical Activity Questionnaire for Adolescents (PAQA) and Adolescent Sedentary Activity Questionnaire (ASAQ). CRF was assessed using 20-m multistage Shuttle Run Test and VO2 Max was estimated using Leger's formula. Descriptive statistics and correlation (Pearson's and Spearman Rank) between the variables was done in SPSS v.16.
Results: The children (54% boys) had a mean age and BMI of 12.8±0.9 years and 20.7±5 kg.m-2 respectively. Mean of SEPA, ASAQ and VO2 Max were 58.2±23.2, 2662±1024 minutes and 41±5.2 ml/kg/min respectively. Majority (51%) had moderate levels of PA. There was weak correlation of SEPA with PAQ-A (r_s=0.31; $p<0.001$) whereas there was no significant correlation of SEPA with other variables.
Conclusion: Contrary to studies from western societies, SEPA did not correlate with CRF and sedentary time. There seems to be limitations in the construct of questionnaires in capturing self-efficacy and sedentary behavior in this population.
Implications: There is a strong need for cultural adaptation of physical behavior questionnaire for our population.

AB No 28: Effect of exercise and lifestyle modification on fatigue and functional capacity in subjects with post-polio syndrome

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http://doi.org/10.18231/j.jsip.2019.043

Purpose: To compare the effect of exercise and lifestyle modification, versus lifestyle modification alone on fatigue

and functional capacity in Post-polio syndrome (PPS) subjects.

Relevance: India has the largest number of polio survivors. Prevalence of PPS is around 80% among polio survivors in Gujarat, India. They present with new musculoskeletal symptoms years after initial paralytic attack. There is a need to study the effect of treatment options, so that appropriate interventions can be implemented.

Participants: Twenty one PPS subjects between 18-65 years of age, able to walk, with or without assistive aids were randomly allocated into 3 groups in this experimental study. Those with diagnosed cardiorespiratory problems, disabling co-morbidity, and cognitive impairment or using psychotropic drugs, were excluded.

Methods: Group A received exercise and lifestyle modification, group B received lifestyle modification alone and group C continued usual routine for 1 month. Fatigue and functional capacity were measured using Fatigue Severity Scale (FSS) and 2-minute walk distance, respectively. Physical and psychological functions were also assessed using PROMIS and PHQ-9. Analysis: Data was non-parametric as determined using histogram and KS test. Wilcoxon test was used for within group data analysis and Kruskal Wallis for between groups. Level of significance was kept 5%.

Results: There was a significant difference in fatigue within group A (Z=-2.375, p.

Conclusion: There is improvement in fatigue, functional capacity and physical function in PPS subjects following lifestyle modification, whereas fatigue and functional capacity improve more significantly when combined with exercise.

Implications: Regular exercise programme with lifestyle modifications can be beneficial in PPS. Those who cannot follow exercise, can be advised lifestyle modification only.

Keywords: Aerobic exercise, Strengthening, Lifestyle modification.

Platform Presentation Abstracts

DAY-III Session: Physiotherapy in Neurological Conditions
Sunday, February 17, 2019

AB No 29: Comparative study of effect of downhill treadmill training with level ground treadmill training on walking ability in persons with chronic stroke.

Authors: Alexander G, Ravindran R.
Affiliation: All India Institute of Physical Medicine and Rehabilitation, Mumbai, India.

http://doi.org/10.18231/j.jsip.2019.044

Purpose: This study was designed to investigate and compare the effect of Downhill treadmill training (DTT) with Level ground treadmill training (LTT) on walking ability in the persons with chronic stroke.

Participants: Study Design: comparative interventional study. 30 subjects with chronic stroke who consented to participate were randomly allocated into intervention (DTT) group (n=15) and control (LTT) group (n=15) by sealed envelope method.

Methods: DTT/LTT group: 15 subjects in each group underwent 30 minutes of DTT/LTT training for 3 sessions/week for 4 weeks with 5% grade of inclination / 0% inclination (Level ground) with self-paced speed along with conventional therapeutic training respectively. Pre and post intervention were measured by 10meter walk test, Timed up Go test, Dynamic Gait Index.

Analysis: Paired t test and unpaired t test were used for 10mwt and TUG. Wilcoxon signed rank test and Mann-Whitney U test were used for DGI. Significance level was kept at P<0.05 for all tests.

Results: Within Group: extremely significant improvement found in gait velocity (10mwt p - <0.0001), functional mobility (TUG p - <0.0001) and gait adaptability (DGI p – <0.0001), in DTT & LTT groups. Between Groups: No significant improvement found in gait velocity (10mwt p – 0.39) and functional mobility (TUG p – 0.80); however, significant improvement found in gait adaptability (DGI p - 0.0359) in DTT group, while comparing post training results of DTT and LTT groups

Conclusion: This study concluded that: Both Level ground treadmill training and Downhill treadmill training are equally effective in improving Gait speed (10mWT) and Functional mobility (TUG). Downhill treadmill training is effective (p - 0.0359) in improving walking adaptability (DGI) when compared with Level ground treadmill training. Further research could investigate effect of different frequencies, durations, and intensities of treadmill training.

Implications: The downhill treadmill training can be added as an effective therapeutic tool to improve the walking adaptability in persons with chronic stroke.

Keywords: Stroke, Downhill treadmill training, Walking ability.

AB No 76: Simultaneous application of Transcranial Direct Current Stimulation (tDCS) and Therapist Assisted Sensorymotor Task Training (TASTT) on paretic hand in patients with subacute stroke-A pilot study

Silver OAK 1, 9.00 AM

Authors: Divya Midha, Narkeesh Arumugam
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http://doi.org/10.18231/j.jsip.2019.045

Purpose: The acquisition of hand motor skills following stroke depends upon the cortical synchrony and the integrity of iplsilesional and contralesional motor circuits in the cerebral hemispheres. With the aim to rebalance the cortical activity and optimize the motor learning, tDCS is reemerged

as promising technique in the field of neurological rehabilitation.
Relevance: To examine the effect of Simultaneous application of Bihemispheric (tDCS) & Therapist Assisted Sensory Motor Task Training (TASTT) on Paretic hand in patients with Subacute Stroke.
Methods: Study was Randomized sham controlled trial with two parallel Groups conducted in the OPD, Department of Physiotherapy, Punjabi University, Patiala. 08 Subacute Stroke patients were randomly allocated to both the groups. Experimental group received Bihemispheric (tdcs) i.e. anodal stimulation to ipsilesional and cathodal stimulation to contralesional motor cortex over C3/C4(1.2ma intensity, 20minutes/session, 5days/week for 4 weeks, based on (10-20 EEG International Classification System) plus TASTT and control group received sham tDCS and TASTT. Pre-Post Intervention assessment was done at 0day, 15th and 30th Day.
Outcome Measures: Fugl meyer Assessment for Upper Extremity (FMA), Digital Dexterity (9PegHole Test), Pinch Strength (Lateral, Chuck and Pulp Pinch), and Grip Strength & (tDCS) adverse effect questionnaire.
Analysis and Results: Within group, statistical analysis revealed significant results for the FMA (f=4.67, p=0.04) in the experimental Group. Non significant results were obtained for Digital Dextrity, Pinch and Grip Strength in both the groups with p>0.05.Between group comparison revealed Non significant findings for all the outcome variables except for Grip Strength with p=0.05).
Conclusion: Study concludes that, although results were statistically non significant but clinical improvement was seen in patients with the changes in the meanscore. Study suggests that large sample trial needs to be conducted for establishing the generalization of results.
Implications: DST-Science Education and research Board (SERB), Walnut Medicaid.

Keywords: Transcranial direct current Stimulation, Stroke, Dextrity.

AB No 85: Concurrent validity of star excursion balance test with bruininks osweretsky test of motor proficiency-2 for balance assessment in children with down syndrome- A Pilot study

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http://doi.org/10.18231/j.jsip.2019.046

Purpose: Balance is amongst the hardest function to acquire in Down syndrome affecting safety and independent skills. Currently available measures for balance assessment are relatively expensive and highly technical like Bruininks Osweretsky test of motor proficiency-2(BOT2) Thus, there's a requirement for an appropriate outcome measure to assess balance in Down syndrome.
Relevance: If validated the Star excursion balance test (SEBT) could prove to be a simple, cost-effective tool i.e. relatively easy to comprehend. Participants: Children with Down Syndrome aged between 5-17 years with no foot surgeries, with functional vision and hearing and ability to follow simple commands.
Methods: Randomization of sequence of test to be performed was done by lottery method. Demonstration of both the tests using visual and verbal cues was done and appropriate trial sessions were given before recording the final scores. For SEBT as a standard method 3 scores were recorded and the average of scores was taken. For BOT2 two test trials were recorded and the best out of the two was recorded.
Analysis: Spearman's test was used to find out the correlation coefficient.
Results: The mean age was 11.20+0.163 with an IQ of 63.80 +17.20 and lower limb length 62.50+8.14. Results showed that there was a strong positive correlation between BOT2 and 3 directions of SEBT i.e. right anterior (r=0.477, p=0.163), left anterior(r=0.404, p=247), right posterolateral (r=0.434, p=0.210), left posterolateral(r=0.606, p=0.64) but showed weak positive correlation with right posteromedial (r=0.296,p=0.588) and left posteromedial (r=0.269,p=0.452) which were not statistically significant.
Conclusion: There is weak to strong positive relationship between BOT2 and SEBT.
Implication: A simple, cost effective and valid tool to assess balance in children with Down syndrome could be established.

Keywords: Equilibrium, Outcome measures, Imbalance.

Day-III Session: Rapid Five

AB No 12: Development and testing of a web portal for facilitating adherence to home-based physical exercises among community-dwelling stroke survivors

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Purpose: i) To develop a web-based program to facilitate adherence to home-based physical exercise program among community-dwelling stroke survivors. ii) To test the feasibility of the web program among stroke survivors.
Relevance: Use of technology like the website is an innovative and motivating method for facilitating adherence to promote the long-term continuance of home-based physical exercise program among stroke survivors. Technology-based strategies will help to simplify, individualize and monitor prescribed exercises time to time to correspond to the capability of stroke patients with

minimum cost and supervision, as it will reduce the number of hospital visits for rehabilitation.
Participants: Stroke survivors living in the community.
Methods: The framework and content of the website were designed based on the findings from our previous work: i) A qualitative study on barriers to adherence among stroke survivors ii) Delphi consensus with international experts and evidence from systematic reviews. A software engineer developed the web-portal. Feasibility and acceptability of the web-app among stroke survivors is ongoing.
Analysis: Awaited.
Results: The web app is called "ADHERE: Adherence to Home Exercises and Rehabilitation." It consists of education on stroke recovery, prescription of exercises in the form of photographs and videos, motivational messages, feedback of daily session, instant messaging to a therapist and sharing achievements in a virtual community. The website can be accessed from any device having internet options. It is useful for stroke survivors as it is an informative, motivating, therapist-supervised, and convenient intervention.
Conclusion: 'ADHERE' is an innovative telehealth intervention for promoting adherence to home-based exercises after stroke. Feasibility assessment is ongoing.
Implications: ADHERE can be made available to other clinicians and stroke survivors across India who have limited access to rehabilitation centers for improving stroke care.

Keywords: Home based exercises, Adherence, Stroke rehabilitation, Tele-rehabilitation.

AB No 83: Influence of environmental dimensions on lower limb muscular activity in ambulatory stroke survivors.

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http://doi.org/10.18231/j.jsip.2019.048

Purpose: Successful reintegration of stroke survivors into community requires gait assessment & training in a challenging environment under dimensions proposed by Patla & Shumway-cook. However, no study has assessed the same in an environment that challenges the individual.
Relevance: Assessment of community mobility of individuals requires an environment which includes dimensions that challenge mobility. Compliance & unpredictability of environment may alter the muscle activity & challenge the individual's gait. Hence community mobility assessment should include muscle activity during gait in an environment with varied dimensions.
Participants: 20 ambulatory stroke survivors from the age range of 18-75 years with first onset of stroke will be recruited. Participants with any other co-morbidity or using ankle foot orthosis will be excluded.
Methods: This is an on-going study (11 participants recruited). Participants were made to walk on a track where they had to negotiate: ramp, stairs, level and uneven terrain, obstacles, answer questions, manoeuvre human traffic & carry load. Resting heart rate & walking heart rate was noted to calculate physiological cost index (PCI). Gait velocity & level of perceived difficulty while walking on different terrains was noted on a scale of 1 to 10.
Analysis: Gait velocity & PCI for 11 participants has been analysed, while muscle activity by EMG will be done after sample size completion.
Results: The mean gait velocity was 0.3m/sec, significantly lower for the stroke individuals compared to level walking (0.8m/s). Mean PCI was 1.12 beats/min. Muscle activity analysis is awaited.
Conclusion: Preliminary results show that environmental dimensions have significant influence on gait velocity and we are yet to infer its effects on muscle activity and PCI.
Implications: Lower limb muscular activity changes in stroke survivors will help us to isolate muscles which need to be focused on during rehabilitation for community participation. Standardization of this procedure will help us to assess the influence of the environmental dimensions as a routine.

Keywords: Terrains, Gait assessment, Stroke, Paretic limb, Level of perceived difficulty.

AB No 99: Development of a questionnaire for evaluation of stroke awareness in general population.

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Affiliation: Amar Jyoti Institute of Physiotherapy.

http://doi.org/10.18231/j.jsip.2019.049

Purpose: To develop a valid and reliable questionnaire to evaluate public awareness about warning symptoms, risk factors and treatment of stroke.
Relevance: Inability to recognize warning signs of stroke, resulting delay in seeking medical care and lack of knowledge of treatment options for the same limits the potential of stroke outcome leading to lifelong disability.
Participants: 5 medical and physiotherapy experts for establishing validity and 100 subjects aged 18 years and above from general population for establishing internal consistency.
Method: Content validity was be established by Delphi process in which five experts in the field of stroke established essential items in the questionnaire. Final questionnaire was administered in 100 subjects aged 18-60 years to assess its reliability.
Analysis: Content Validity Index (CVI) and Cronbach's Alpha were calculated for validity and internal consistence respectively using MS Excel.
Result: CVI was calculated at 0.88. 65 females and 35 males with mean age of 27 +. There mean score on the

questionnaire was 23.78 ± 4.40. Cronbach's Alpha was found to be 0.66.

Conclusion: The developed questionnaire is highly valid and moderately reliable tool for evaluating stroke awareness in general population. Based on its findings appropriate measures can be taken to improve people's knowledge about stroke.

Implications: This questionnaire is proposed to be a useful tool which can be used effectively in stroke awareness campaigns.

Keywords: Stroke, Questionnaire, Awareness.

AB No 102: Upper limb muscle activity during action observation of reaching task in stroke survivors -A pilot study

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Purpose: To assess upper limb muscle activity using Surface EMG during Action Observation (AO) and imitation of reaching task in terms of Normal movement pattern, Error movement pattern, Proximal components of the task (shoulder & elbow), and Distal component of the task (wrist).

Relevance: Most of the studies have focused on AO of normal movements during training. However, influence of AO of error movements needs to be explored since error detection and correction are the major attributes of motor re-learning.

Participants: Five patients with first time unilateral stroke having brunnstorm voluntary control >2-6 and MOCA score >26 within 6 months of onset, are included in the study.

Method: In this cross sectional study patients were asked to observe the pre-recorded videos of a reaching task in a third person perspective followed by imitation using a box car paradigm in the order of normal and error movement pattern, proximal and distal component of the task. Muscle activity over six muscles of upper extremity (anterior deltoid, Supraspinatus, Biceps, Triceps, Brachioradialis and extensor carpi radialis) by using surface EMG was measured during the AO and imitation of all four tasks.

Analysis: Descriptive statistics was used to analyse the % MVC across the test conditions.

Results: Triceps muscle activation was found to be greater in all four conditions, exceptionally more in Error movement pattern (86.66%). All muscles were found to be more active during AO of proximal components of the task compared to AO of distal components of the task.

Implications: Error movement pattern should be given emphasis while framing AO treatment module to improve reaching in patients with stroke. AO of proximal components of the task should be given emphasis in order to activate all muscles of upper extremity following stroke.

Keywords: Movement observation, Mirror neuron system, Stroke rehabilitation.

DAY-II Session: Poster Presentation

AB No 05: Pre-activity screening practices and emergency preparedness in gymnasium/ fitness center in Udupi Taluk: A survey

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http://doi.org/10.18231/j.jsip.2019.051

Purpose: To evaluate the sensory, motor and functional abilities in burn hand patients and control group. To elucidate the relationship of sensory, motor and functional abilities in burn hand patients and control group.

Relevance: To determine the relationship between sensory, motor and functional abilities in burned hand patients.

Participants: Individuals aged between 15-60 years satisfying the examination process were included. Two groups were allocated, including 10 burned hand patients & 10 controlled subjects.

Methods: Pain, temperature & 2- point discrimination sensations were tested in 10 burned hand patients and 10 control healthy subjects for testing sensory abilities of hand. Strickland method, Kleinert method & Grip strength, motor functions were tested 10 burned hand patients and 10 control healthy subjects for testing motor abilities of hand. MHQ functional abilities were tested 10 burned hand patients and 10 control healthy subjects for testing functional abilities of hand. The 2 groups were compared & a correlation data analysis examined the relationship between sensory, motor & functional abilities of hand.

Analysis: The present study was designed to provide a quantitative evaluation of sensory, motor and functional abilities in burned hand patients and control group.

Results: There is a significant difference of TBSA with VAS, MHQ work, aesthetic and satisfaction and there is no significant difference of TBSA with pain, temperature, 2-point discrimination, Strickland method, Kleinert method, grip strength, MHQ Overall hand function, ADL's, pain and overall ADL's. It also indicates that there is a significant difference of degree of burn with VAS, pain, temperature, 2- point discrimination, Strickland method, Kleinert method, grip strength, MHQ overall hand function, pain, work, ADL's, aesthetic and overall ADL's. Sensory, motor & functional abilities of hand were decreased was objectified in patients compared with the control group.

Conclusion: TBSA was significantly co-related to pain and functional abilities in terms of work, aesthetics and satisfaction. The degree of the burn was significantly related to sensory, motor and functional abilities. TBSA showed an insignificant relationship with motor abilities.

Implications: The association between sensory, motor and functional abilities among burned hand patients results in the assessment and goal setting process to guide the

treatment along with those problems reported by the patients.

Keywords: Sensory functions, Motor functions, Functional abilities.

AB No 11: Correlation of the subjective visual vertical (SVV) with age and balance-static and dynamic in community dwelling elderly.

Authors: Dhvani Desai, Vimal Telang
Affiliation: All India Institute of Physical Medicine and Rehabilitation.

http://doi.org/10.18231/j.jsip.2019.052

Purpose: The subjective postural vertical (SPV) and the subjective visual vertical (SVV) are the two main ways to assess the vertical perception. The perception of visual verticality is independent of the perception of postural verticality (eg; in Pusher's syndrome). Studies have shown that there is a tilt of SVV caused by higher visuo-vestibular dysfunction resulting in a perturbed construction of gravitational reference; an increased shift of SVV in patients with Parkinson's disease which correlates with the postural instability, hence the need to assess the presence of a change in SVV in elderly and its relation to their static and dynamic balance.
Relevance: Subjective Visual Vertical tilt, may also be one of the possible mechanisms to explain vestibular function and balance impairments in the elderly.
Participants: 100 community dwelling elderly (74-M, 26-F) age >60 years, ambulatory with/without walking aids, Mini Mental State Examination score>24, 6*6 corrected vision & performing sit to stand test at least 5 times in 11-15 seconds. Those with clinical manifestations of central/ peripheral neuromuscular disorder, musculoskeletal, hearing, visual field/vestibular system, any recent ear infection or major surgical interventions in the previous 6 months were excluded.
Methods: It was an analytical cross sectional study by convenience sampling. All subjects were assessed for the SVV (bucket method), modified Clinical Tests of Sensory Interaction on Balance (m-CTSIB) (static balance) and Dynamic Gait Index (DGI) (dynamic balance).
Analysis: Normality test not passed hence Spearmen's correlation.
Results: The correlation: SVV and (1) age; r= 0.245 ($p < 0.05$) (2) m-CTSIB; r= 0.00803 & (3) DGI; r=0.0499 ($p > 0.05$)
Conclusion: There was a mild positive correlation between SVV and age, and no relation of SVV with static and dynamic balance in community dwelling elderly above 60 years of age. A correlation of the SVV with balance in elderly having a risk of falls could be done.
Implications: The perception of visual verticality does not affect the static and dynamic balance of community dwelling elderly individuals.

Keywords: Subjective visual vertical, Static and dynamic balance, Community dwelling elderly.

AB No 13: Correlation of sleep parameters with physical activity status in school going children in Delhi: A report

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Affiliation: Jamia Millia Islamia.

http://doi.org/10.18231/j.jsip.2019.053

Purpose: The present study was designed by the authors to analyze the correlation between physical activity (PA) status and sleep parameters in school going children in Delhi. This is a unique population due to the unique physical, psychological and social stresses placed over it.
Relevance: School children who are able to attain the>9 hours of sleep per night throughout the week have demonstrated better PA as compared to those who slept less than that. A bidirectional association has been observed between PA and sleep i.e greater level of PA during the day is associated with better sleep quality at night, and a poorer sleep quality at night is associated with lower level of PA the next day.
Participants: The sample size was calculated at 80% power using G power software. This study recruited 72(M-47, F-25) participants from a Delhi based school aged in between 11-13 years.
Methods: Ethical clearance was taken prior to the commencement. The students were randomly selected from grade 8 and were handed out the relevant scales for assessing sleep quality, daytime sleepiness, and physical activity status.
Analysis: Spearman's rank correlation coefficient was calculated to report the relevant associations.
Results: PA was weakly correlated with sleep quality and daytime sleepiness, daytime sleepiness was moderately correlated with sleep quality.
Conclusion: Poor sleep quality is associated with daytime sleepiness and low level of physical activity in school going children. More research is needed to confirm the causality between these variables.
Implication: It's postulated that the alterations in quantity and quality of sleep and the daytime sleepiness could be a leading cause for diminished PA in adolescents, and deficient sleep along with daytime sleepiness could eventually decrease the motivation to exercise. This drop in the amount of PA among school children is concerning, and it has been linked with an increase in the risk factors for type 2 diabetes, and rate of obesity. Attaining the recommended levels of PA and sleep must be considered as central components to keeping a healthy lifestyle in school children.

Keywords: Sleep quality, Physical activity, Daytime sleepiness, School going children.

AB No 14: Efficacy of core muscle stabilization on recruitment order, lumbar mobility and stability in healthy subjects with altered recruitment of transverse abdominis muscle: A case study

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http://doi.org/10.18231/j.jsip.2019.054

Purpose: To evaluate the efficacy of structured exercises which activate Transverse abdominis (TrA), diaphragm and pelvic floor muscle on TrA recruitment, lumbar lordosis and trunk mobility.
Relevance: To evaluate the efficacy of structured exercises which activate Transverse abdominis (TrA), diaphragm and pelvic floor muscle on TrA recruitment, lumbar lordosis and trunk mobility
Participants: A 24 year old healthy male student whose BMI- 27.28 who had altered recruitment of TrA.
Methods: The intervention was for 2 weeks, 5 days/week where each session included core stabilization exercise i.e 90-90 bridge with balloon and ball; lumbar mobility exercises- knee to chest, lumbar rotation in supine, side flexion in standing and cat camel exercise with 10 repetitions per session/day. The primary outcome measure is deep muscle contraction (DMC) scale- transverse abdominis muscle recruitment, secondary outcome measures are pressure biofeedback unit- activity of transverse abdominis muscle, modified modifiedschober's test (MMS)-lumbar range of motion in flexion and extension and degree of lumbar lordosis- flexicurve scale. These tests were performed pre (Day-1) and post intervention (Day-10).
Analysis: Not relevant.
Results: The results of DMC scale showed significant change from 5/10 to 8/10, the pressure biofeedback score improved 4 mmHg, degree of lumbar lordosis reduced 18^0 and MMST didn't show considerable change.
Conclusion: This case study concludes as recruiting transverse abdominis along with diaphragm and pelvic floor showed significant changes in muscle activation, posture and range of motion of lumbar spine, however it is suggested to carry it over a large population & with longer intervention period. We can also find whether it will prevent development of low back pain.
Implications: It would be beneficial to include these exercises for maintaining healthy spine and correcting faulty posture and use it as a preventive rehabilitation measure to curb development of chronic low back pain in near future.

Keywords: Muscle activation, Recruitment, Posture.

AB No 17: The effect of weight and dimension of smart phone on grip strength and pinch strength of physiotherapy students in Delhi: A pilot study

Authors: Madhvi, Kshitija Bansal
Affiliation: Amar Jyoti Institute of Physiotherapy.

http://doi.org/10.18231/j.jsip.2019.055

Purpose: To study the effect of weight and dimension of smart phone on hand function of physiotherapy students.
Relevance: Smart phone usage is ever rising in this decade especially amongst students which is leading to many detrimental effects on musculoskeletal system. The reduction in hand grip can attribute to physical and psychological factors and affect a person's professional as well as social life. Physiotherapy is a profession which requires lot of hand skills, thus it is relevant to study effect of dimensions and weight on hand function in Physiotherapy students.
Participants: 40 Physiotherapy student volunteers of age group 18-25 years using smart phone for more than 1 year were selected via screening questionnaire having SAS-SV score M>31 and F>33. Further, students who had recent fractures, soft tissue injury, diagnosed nerve injury, radiculopathy affecting hand function were excluded.
Method: The volunteers were assessed for their grip strength, pinch strength by hand held dynamometer and pinch gauze respectively. Further, the dimensions and weight of their smart phone was recorded.
Analysis: The data was analysed by SPSS version 16.0 With Pearson correlation coefficient, t test.
Result: The study was conducted on 40 volunteers (M=9, F=31) with mean age of 21.92±1.96 years and mean BMI of 23.17±3.88 kg/m2. The mean grip strength and pinch strength were (M=41.22±6.66, F=22±4.14) kg and (M=8.83±1.22, F=5.93±1.16) kg respectively which was significantly less as compared to normative values. There is a statistically non-significant negative correlation between the smart phone dimension and weight with grip strength and pinch strength. But significant negative correlation was observed between SAS score and dominant hand grip, pinch strength with r = -.345, -.370 at $p<0.05$ respectively.
Conclusion: There is definite negative effect of weight and dimension of smart phone on hand grip and pinch strength, which needs further investigation.
Implication: The study results can be used to help create general awareness about the negative effect of smart phone use.

Keywords: Smart phone, dimension, hand strength, Physiotherapy students.

AB No 32: Knowledge and practice of body mechanics techniques among the nurses.

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Affiliation: Ahmedabad Institute of Medical Sciences.

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Purpose: Poor body mechanics are often the cause of various musculoskeletal problems. Nursing is a job that needs lot of muscle exersion, because of which many are at risk for developing physical strains and spinal injuries. So purpose of the study was to assess the knowledge and practice of nurses regarding body mechanics. The secondary objective of the study was to find out correlation between

the knowledge and practice of nurses regarding body mechanics.
Relevance: Awareness can be created and advises can be given for different body mechanics principles in during work. Ergonomic training can be arranged according to the requirement. Participants: Data was collected from 301 nurses including 184 nursing students and 117 nursing staff with the non-probability purposive sampling.
Methods: Descriptive approach was used with structured knowledge questionnaire and practice checklist from various government and non-government hospitals and colleges.
Analysis: Cross sectional Survey and descriptive correlation design was adopted for the study.
Result: The extent of knowledge in 301 nurses are, 56.4%-Good, 41.4%-Moderate and 2.1% are having poor knowledge; 3.6%-Good, 62.9%-Average and 33.6% are doing Poor practice. There was a weak positive correlation between knowledge and practice of body mechanics, that was r=0.270. Correlation was significant at 0.001 the level (2-tailed).
Conclusion: Though the nurses were having knowledge about body mechanic but less practicing it. Further studies can be done with the major sample size, including many areas of various cities, specific according to experience and according to specific demographic variable so that to generalise the results.
Implications: Nurses need to be more educated about body mechanic technique and they should be emphasized to practice it in performing nursing procedure. This is important to ensure that the implications of the misuse of body mechanics such as back pain can be avoided.

Keywords: Knowledge and Practice body mechanics nurses.

AB No 35: Safety and effectiveness of physiotherapist-led, individualised high intensity interval training (HIIT) classes for a clinical population: Descriptive analysis of a case series.

Authors: Shuchi Kataruka, Chhavi Kalra, Debashish Das, Rebekah Das
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Purpose: Evaluate the effectiveness and safety of an individualised HIIT circuit class in meeting fitness goals of individuals attending a physiotherapy clinic.
Relevance: Sedentary behaviour is a determinant of early mortality, yet people with musculoskeletal complaints may find exercising to recommended levels difficult. HIIT improves fitness in a variety of populations.
Participants: The first 11 participants (10 females (18-57 years) and 1 male (48 years)) who completed 12 HIIT classes and subsequently attended fitness re-assessments within 1 week were included in this retrospective data analysis. Ten participants had moderate cardiovascular/metabolic disease risk and 7 were novice exercisers. Musculoskeletal complaints included neck, back, knee and heel pain.
Methods: Prior to joining HIIT classes, all participants underwent fitness assessment including YMCA step-test, anthropometric measurements and sit-and-reach test. Participants described exercise goals and an individualised program was designed. The class involved a warm-up, six stations of HIIT followed by stretching. Each HIIT station comprised 2 minutes of a variety of strength, mobility, balance or endurance exercises followed by 30 seconds of high-intensity activity. Fitness re-assessment was completed subsequent to the 12th class.
Analysis: Descriptive pre-post analysis of heart-rate recovery, anthropometric and flexibility data was completed for the case series. Adverse events were summarised.
Results: All participants improved at least one fitness component. Heart rate recovery and waist measurements demonstrated most change, especially in those with higher BMI. No major adverse events occurred.
Conclusion: Physiotherapist led HIIT classes can improve the fitness of clinical populations.
Implications: Physiotherapists can assist vulnerable individuals to meet fitness goals as part of comprehensive attention to health optimisation.

Keywords: Exercise, High Intensity Interval Training (HIIT), Musculoskeletal, Fitness assessment.

AB No 36: Rehabilitation in extracorporeal membrane oxygenation (ECMO) – Neglected or unenlightened?

Authors: Khushboo Bhatt, Veena Nambiar
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http://doi.org/10.18231/j.jsip.2019.058

Purpose: Extracorporeal membrane oxygenation (ECMO) is increasingly gaining favourability and popularity owing to the rise in cardiopulmonary dysfunction. Hence, awareness about the need for rehabilitation, spanning the course of ECMO treatment, is essential for physiotherapists. The need for the review arises as there are lacunae in the available literature and practice of rehabilitation, particularly in India.
Relevance: Rehabilitation is essential during and after treatment with ECMO to aid in the faster recovery of functional independence and subsequently improve the quality of life. This narrative literature review aims to provide the necessary evidence for therapists to make informed decisions on therapeutic strategies that could facilitate recovery. Additionally, this can develop awareness regarding ECMO care with special emphasis on physiotherapy practice.
Participants: No participants, Narrative Review
Methods: Non-systematic narrative literature, which is indexed in the following: PubMed, Google Scholar, PEDro, central. **Analysis:** Descriptive analysis.

Results: According to recent evidence, patients on ECMO showed a significant improvement following rehabilitation on various outcomes such as Acute Physiology and Chronic Health Evaluation II (APACHE II) scale, MRC grading, Intermacs profile, ICU mobility scale (IMS), 6MWT, SF-36 version II, FIM and Manchester Mobility Score.
Conclusion: Treatment of severe reversible cardiopulmonary dysfunction with ECMO is increasing. After considering all barriers and facilitators to treatment, active participation in physical therapy, including ambulation, can provide a more rapid recovery. Further research is needed to provide our best practice and fully evaluate potential benefits and risks.
Implications: There is a dire need to recognize the importance of rehabilitation and provide quality multidisciplinary care to the patient. Physiotherapists need to be sensitized about available assessment and treatment strategies and deepen their understanding of ECMO. This will enable them to provide better standards of care to this population.

Keywords: Extracorporeal membrane oxygenation, Physiotherapy Interventions, Rehabilitation.

AB No 53: Development of an intervention protocol of task specific training for paretic lower extremity in early subacute stroke patients.

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Purpose: The purpose of the study was to design a protocol of task specific training for lower extremity for early subacute phase following stroke.
Relevance: A standard therapy protocol to address all the functions of lower extremity is not evident from the available literature. Gait, balance and sit to stand are the major areas of research following stroke. Balance or postural control has been studied predominantly in standing. Contribution of lower limb postural control in positions like sitting, were not explored in detail for therapeutic intervention. Moreover research is extensive in chronic and later sub-acute period of stroke compared to early subacute period. Hence, there is a need for developing a intervention protocol of task specific training for paretic lower extremity in early subacute stroke population.
Methods: A Delphi survey was designed to get Expert Consensus for developing a exercise protocol for lower extremity. Two rounds of Delphi was planned. The first round consensus for the functions of lower limb and the second round received consensus on task specific exercises to improve functions of lower limb was planned. Physiotherapists with minimum 10 years of practice in stroke rehabilitation were considered for expert panel.
Results: Fifteen physiotherapists were included as expert based on their consensus to respond to Delphi and participate in the study. First round was responded by 14 and second round was responded by 14 respondents. In the first round weight bearing, postural control, sit to stand, bed mobility, stepping, walking, standing, recreational and sporting activities like kicking, cycling, and potential tasks like carry and walk were accepted as functions of lower limb by 70% Delphi panel. Self care, manipulation and stereognosis were not accepted as lower limb functions. Delphi round 2 was sent with exercises to improve the functions accepted in the round one. Exercise protocol was designed based on 70% consensus for the exercises. The designed exercise protocol will be presented.
Conclusion: A protocol was designed based on consensus on task specific training for lower extremity in early subacute stroke patients. Keywords: Stroke, Task specific training, rehabilitation.

Keywords: Stroke, Task specific training, Rehabilitation.

AB No 54: Translation and validation of Gujarati version of fatigue severity scale

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Purpose: To translate and determine the validity of Gujarati translated version of Fatigue Severity Scale (FSS).
Relevance: Fatigue is a complex symptom that is difficult to study because of its multiple types and causes. FSS is a frequently used inventory for measuring fatigue consisting of a nine-item questionnaire developed by Krupp et al. It has high internal consistency (0.81–0.94) and satisfactory test–retest reliability (ICC: 0.82). For meaningful comparison to be carried out between various patient groups, it is necessary to investigate the psychometric properties of the FSS in the different population as well. This study aims to translate FSS into Gujarati language for its reproducibility in wider population.
Participants: Eight experts having experience of 8.56 + 2.39 years, consisting of neurologists, physicians and physiotherapists were included.15 subjects between 25-60 years, having conditions like parkinsonism(n=5),post-polio syndrome(n=10) having primary symptom of fatigue, understanding English and Gujarati languages were included.
Methods: In this cross sectional survey, translation of fatigue severity scale was done into Gujarati as per guidelines of World health organization using forward-backward translation, cognitive debriefing and pilot testing. The final version was then tested for face, content and concurrent validity.

Analysis: Level of significance was kept 5%.Data was analyzed using histogram and correlation test.
Results: 9 females and 6 males, between 45.6 + 5.3 years were included in the study. Face and content validity was established by reviewing of the Gujarati FSS by experts (n=8), with mutual consensus. Concurrent validity was assessed using Pearson's correlation, with the coefficient being 0.81 ($p<0.05$) suggesting strong positive correlation between original FSS and its Gujarati version.
Conclusion: The translated Gujarati version of FSS is comparable with the original English instrument in terms of face, content and concurrent validity.
Implications: Gujarati version of FSS can be used for Gujarati population to assess and manage fatigue across various pathological conditions and across various rehabilitation settings

Keywords: Fatigue severity scale, Translation, Validity.

AB No 62: Combined effect of transcranial direct current stimulation (tDCS) and video games on executive functions in an attention deficit hyperactivity disorder (ADHD) Child: Single case study

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http://doi.org/10.18231/j.jsip.2019.061

Background: Attention Deficit Hyperactivity Disorder (ADHD) is a common neurodevelopmental disorder characterized by inattention, hyperactivity and impulsivity, all of which present as a deficit in executive function. The prevalence of ADHD ranges from 1% to 20%, depending on the diagnostic criteria used, methods of investigation employed and the population of children included. Pharmacotherapy, Physical Exercise, Cognitive Behavioral Therapy (CBT) and Computer based games are being currently used to improve executive function. Transcranial Direct Cranial Stimulation (tDCS) is an emerging treatment for ADHD which can modulate neuronal activity.
Aims: The purpose of the study is to find the additional effect of tDCS along with video games on executive function. Objectives: To observe the immediate effect of tDCS application when combined with a car racing game on executive function in ADHD.
Case Description: A 15 year old boy was screened with ADHD as per Vanderbilt Assessment Scales. As reported by his mother and teachers he was found to be ignorant, reluctant to follow instructions and is easily distractible which affected his academic performance. Combined application of tDCS and computer based racing video game for was given for 20 min /session for 4 consecutive days. tDCS was applied through a pair of saline soaked sponge electrodes with size of 35 cm2 (7 x 5) at an intensity of 1mA. Pre Post Intervention assessment was done using Vanderbilt Assessment Scales for evaluating symptoms and Trail making test A and B for evaluating executive function.
Results: There is significant improvement in scores of Vanderbilt Assessment Scales and in response timings of Trail making test A and B.
Conclusion: It can be concluded that there is an immediate effect of tDCS application when combined with a car racing video game on executive function in ADHD.
Suggestions: RCT's and study with more sample size should be done.

Keywords: ADHD, Executive function, tDCS, Video games.

AB No 71: Behavioral abnormalities and it's relationship with cognitive functions in school going adolescents

Authors: Rhythm Sharma, Narkeesh Arumugam, Divya Midha
Affiliation: Punjabi University, Patiala.

http://doi.org/10.18231/j.jsip.2019.062

Background: Adolescence is an immense change in the emotions and behavior, visible during 10-19 years of age. Normal adolescent behavior is often moody due to hormonal and physical changes. It is described as the stage of life in which the thoughts of an individual take more of an abstract form and reduction in the egocentric thoughts. It is seen that there is considerable growth and change in various regions of the prefrontal cortex throughout the adolescence period.
Objective: This study is aimed to find the correlation between behavior abnormalities and cognitive Function in school going adolescents.
Method: 100 children were taken from CBSE and PSEB schools, Patiala of 12-16 age groups. Convenient sampling was done. The teachers were blind to fill the form to test the behavior of students at school, and the students performed the test to check changes in cognitive ability. Outcome measures included were Child and Adolescent Disruptive Behavior Inventory (CADBI) for behavior analysis, and Montreal Cognitive assessment (MoCA) to screen students' cognitive level, scores was assessed for one time.
Result: Montreal Cognitive Assessment (MoCA) and Child and Adolescent Disruptive Behavior Inventory (CADBI) negative correlation was found with ($r = -0.3873$) and level of significance was ($p<0.0001$).
Conclusion: The results of this study demonstrated that if the behavior of the students is becoming disruptive then it will affect cognitive function of the individuals.
Suggestion: It is suggested that further trials can be conducted based on effect of physiotherapy interventions in improving cognitive functions and thereby improving the behavior of the adolescents.

Keywords: Adolescent, Behavior abnormalities, Cognition.

AB No 74: Combined effect of transcranial direct current stimulation (tDCS) and functional electrical stimulation (FES) to upper limb recovery in patient with subacute stroke survivors.

Authors: Maya Devi, Narkeesh Arumugam, Divya Midha
Affiliation: Punjabi University, Patiala.

http://doi.org/10.18231/j.jsip.2019.063

Background: Stroke is the leading cause of death across the globe. As a consequence to it Upper limb motor impairments remains the primary cause of Functional dependence for many activities of daily living. Many therapeutic interventions has been attempted based on the lesion approach. Present study has been conducted to find out the combined effect of tDCS and functional electrical stimulation, that works on the principle of cortical remodulation and brain plasticity to enhance the functional recovery in upper limb and hand.
Objective: This study aimed to examine the combined effect of transcranial direct current stimulation (tDCS) and functional electrical stimulation (FES) to upper limb recovery in patients with subacute stroke.
Method: 20 subacute stroke participants were included in the study. They were randomly allocated to both the groups. Group A (Experimental) and Group B (Control Group). Participants in Group A received tDCS + FES+ conventional program and in Group B receive tDCS + conventional treatment, 5 sessions/ week for total 3 weeks. Hand inventory, manual dexterity (hand dynamometer, Nine peg hole, pinch gouge) score were asses before and after the intervention.
Result: Statistical analysis revealed significant findings for FMA-UE t = -21.33,Chedock arm and hand inventory t =-25.73, manual dexterity(power grip strength t= -9.92 and lateral pinch grip t=-6.70, Chuck pinch t=-8.14, P value $\leq$ 0.05 in these domains. and non- significant findings with p value $\geq$ 0.05 for Nine peg hole and pulp to pulp pinch.
Conclusion: Statistically results were found to be significant for FMA-UE, Chedock arm and hand inventory, manual dexterity (power grip strength and lateral pinch grip and Chuck pinch. Those justifying the combined effect of tDCS and FES.

Keywords: Stroke, tDCS, FES, Cortical remodulation, Brain plasticity.

AB No 84: Establishing validity and internal consistency of the Hindi translation of montreal cognition assessment scale

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http://doi.org/10.18231/j.jsip.2019.064

Purpose: Purpose of the study was to assess the validity and item reliability of Hindi translated version of MOCA for use on Indian Hindi speaking population.
Relevance: MOCA Scale is a quick screening tool for detecting mild cognitive impairment. As it is an English self-reported measure, it can not to be administered in people whose native language is Hindi.
Participants: 100 Community dwelling individuals aged 18 years and above who could read or understand Hindi.
Methods: Original scale was translated to Hindi, independently by two Hindi translators. After this synthesis of the translations was done to suit the cultural context of India. This was followed by back translation in order to verify the adherence of the Hindi version to the sense of the original version. Then this version was presented to 100 adults and their response were noted for assessing internal consistency.
Analysis: Descriptive statistics and calculation of Cronbach's Alpha for internal consistency was done using SPSS version 16.0.
Results: The scale was administered on 40 males and 60 females between the age of 18 to 93 years with mean age 49.26 years. The value of Cronbach's Alpha value was calculated to be 0.76.
Conclusion: The Hindi, culturally adapted version of MOCA has good internal consistency and is a valid tool that can be administered in Hindi speaking population for assessment of cognition especially in the elderly population as it can detect even mild cognitive impairment.
Implication: The Hindi translated version of MOCA is available in Hindi. It will facilitate its use in clinical and research work in India.

Keywords: Cognition, Montreal Cognition Assessment Scale, Elderly.

AB No 93: Perception about authorship among healthcare students- A systematic review and a survey

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Background: Involves two studies; a systematic review exploring the healthcare students' awareness and perception about authorship, followed by a survey of the same in Indian context.
Purpose: To have an insight about students' awareness about authorial identity in academic writing and to explore literature on the same.
Relevance: Unintentional plagiarism contributes major proportion of unethical writing resulting from lack of perception of authorship.
Participants: Review: Healthcare students (medicine, dental, psychology, rehabilitation & allied branches)
Survey: Post Graduate (PG) students of Physiotherapy, Occupational therapy and Prosthetics & Orthotics

Methods: Review: A systematic literature search was conducted using PRISMA-P 2015 guidelines on PubMed, GoogleScholar, MEDLINE and ScienceDirect. No limitations were placed on study design, intervention type, outcomes. of studies.
Survey: Cross-sectional survey was conducted through purposive sampling among 186 PG students from 17 institutes across India using "Student Attitudes & Beliefs on Authorship Scale".
Analysis: Correlational analysis by Spearman's Rank Correlation and comparisons by Mann Whitney U & Kruskal Wallis Tests were done (SPSS version21), $p<0.05$.
Results: Review: Awareness and perception about authorship among students varied with majority of the studies indicating a need to improve it. A few studies recommended strategies to overcome the lacunae.
Survey: Perception about authorship was satisfactory (4.91 ± 0.48 on 1 to 6 scale) in PG students with no significant difference with respect to their academic year ($p=0.43$). Understanding about authorship correlated positively ($\rho=0.15$; $p=0.00$) with number of researches done.
Conclusion: Perception about authorship differs amongst healthcare students. Very few studies addressing this were found in Indian context. There's a scope of improvement about the same in PG students.
Implications: This study highlights the need to come up with strategies as targeted academic activities, adding plagiarism related issues in PG curricula and disciplinary actions for non- compliers; hence making research writing more ethical right from PG level.

Keywords: Authorial identity, Academic writing, Plagiarism, Publication ethics.

AB No 105: Physical function and balance in OA knee subjects with and without back pain

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Background: Osteoarthritis (OA) of knee is one of the most common musculoskeletal disorders that increases global health burden. Various researches, aimed to improve pain and physical functions in subjects with OA knee have been conducted. Yet, there is dearth on researches evaluating coexisting low back pain and its impact on physical function limitation and risk of fall in subjects with knee osteoarthritis, whilst there is pool of researches on kinetic chain evaluation including lumbar spine for athletic population for injury prevention.
Methodology: 22 Subjects with OA knee, age of 50-70 years (male or female) willing to participate in the study were included in the study. Demographic details including age, BMI (Body Mass Index), duration of knee pain were recorded. Subjects were screened for presence of low back pain, presence of segmental instability (using passive lumbar extension test), balance (using Dynamic Gait Index), and physical function using mWOMAC.
Results: Data was analyzed using SPSS. There were significantly greater ($p<0.05$) changes in balance and function of individuals with presence of clinical lumbar segmental instability. Additionally, BMI and Duration of knee pain also correlated positively with balance and function deficits in all individuals.
Conclusion: Presence of low back pain in subjects with OA knee puts them on greater risk of fall and limits functional ability as well.
Implication: Such correlation between low back pain and physical function and balance has important implications for rehabilitation of subjects with OA knee.

Keywords: Knee Osteoarthritis, Low back pain, Balance, Physical Function.

AB No 107: Effect of research exposure on knowledge, attitude and perception of postgraduate physical therapy students – An observational analytical study

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Purpose: To analyze the effectiveness of a seminar in changing the knowledge, attitude and perception of post-graduate students towards Research Methodology.
Relevance: Research helps to develop a scientific critical attitude and is important for policy making and decision making. Seminars can be conducted to remove or reduce the barriers students face in the implementation of research activities in the field of physical therapy.
Participants: 90 post-graduate students of physical therapy who consented to participate in the study were included.
Methods: The students were asked to fill a questionnaire about their attitude, perception and knowledge regarding research before the seminar. A seminar on 'Synopsis writing' was conducted and the students were then asked to fill the same questionnaire after the seminar.
Analysis: Frequencies for all the questions were calculated and Chi-square test was applied to analyze the association between the results of the questionnaire before and after the seminar.
Results: Chi-square test analysis showed a statistically significant association between the pre and post seminar results for all the questions related to knowledge, perception and attitude ($p<0.05$) except one question in attitude (Do you think you like research?) ($p=0.075$, $\chi2=5.180$) and knowledge (Do you know the types of research designs?) ($p=0.255$, $\chi2=4.061$).
Conclusion: Appropriate teaching can improve Knowledge, Attitude and Perception of Post graduate Physiotherapy students towards Research

Implications: Appropriate teaching of "Research" can be conducted in order to improve the knowledge, attitude and perception of post-graduate students about research.

Keywords: Knowledge, Perception, Attitude, Research Methodology, Physiotherapy.

AB No 111: Relationship of dynamic and functional balance with executive functioning in elderly

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Purpose: To establish relationship of dynamic and functional balance with executive function in elderly
Relevance: It has been suggested that executive functioning like visual attention and working memory/visuospatial processing are important during complex tasks during daily activities. Its relationship with balance needs to be studied in order to understand the mechanism of falls and activity restriction.
Participants: 232 subjects aged 60 years and above having capability of walking aided or unaided, without any neurological disorders were conveniently recruited from community.
Methods: Timed Up and Go (TUG) Test and Berg Balance Scale (BBS) were used to assess dynamic balance and functional balance respectively. Trial Making Test Part A was used to assess visual attention and Part B was used to assess working memory/visuospatial processing.
Analysis: SPSS Version 16.0 was used for descriptive statistics, Pearson's correlation test and multiple linear regression analysis.
Results: TUG is positively correlated with TMT A (r=0.44, p=0.00) and B (r=0.40, p=0.00). BBS is negatively correlated with TMT A (r=-0.44, p=0.00) and B (r=-0.38, p=0.00).
Conclusion: There is moderately strong, significant correlation of dynamic and functional balance with executive functioning in elderly.
Implications: Inclusion of interventions that can improve the executive functioning may have great potential to accelerate balance rehabilitation of elderly.

Keywords: Balance, Executive functioning, Elderly, Visual attention, Visuospatial processing.

AB No 88: A systematic review on the prevalence and associated factors of lower back pain among physiotherapy students

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Purpose: To Understand the Prevalence of Lower Back Pain (LBP) among Students Studying Physiotherapy as a Future Profession Through the Revision of Literature.
Relevance: LBP episodes are recurrent due to certain characteristics seen in physiotherapy students. Increased exposure to clinical practice, increases the chances of reoccurrence for these students. Unless adequate preventative techniques are introduced, LBP progresses into later stages of his/her career.
Participants: 1,428 Physiotherapy students participated. Students who were in the field of Physiotherapy ranging from Diploma to Doctorate levels, perform therapeutic treatments and who experienced LBP within the duration of the course were noted.
Methods: An electronic search for articles published in BMC Musculoskeletal Disorders, ResearchGate and NCBI (PubMed), from the past 15 years was conducted.
Analysis: All mentioned databases were searched and abstracts that matched the inclusion criteria were selected and full-text articles were obtained. Articles were critically appraised by the JBI Checklist for Analytical Cross-Sectional Studies and Mixed Methods Appraisal Tool. Once studies obtained, descriptive analysis was done with the all researches proceeding with a response rate over 70%.
Results: The average duration of the courses from diploma to doctorates were approximately 4 years and the prevalence increased within the course duration. The average age of students suffering from LBP ranged from 21- 25 years and the age of onset was between 16- 19 years. Individuals in this age are prone to rapid growth and improper body mechanics. Furthermore, Physiotherapy students were 2.55 times more likely to experience LBP compared to students of other courses in university.
Conclusion: LBP was increasingly prevalent, increasing with the progressive duration of the course. Academic factors were the causative agent and proper preventative techniques should be taken into account.
Implications: Increased prevalence of LBP hinders the workforce when these students graduate with a presenting burden of LBP as well as their quality of life.

Keywords: Lower back pain, Physiotherapy students, Prevalence.

AB No 118: How far you can accelerate in anterior cruciate ligament reconstruction rehabilitation– A sprinter's case report

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Purpose: To determine the effectiveness of a tailor-made accelerated rehabilitation protocol in facilitating early return to the track by a national level sprinter who underwent an

arthroscopic All inside ACL Reconstruction post a grade 3 ACL tear for right knee sustained during box jumps.
Relevance: To experiment, if we can design more accelerated and effective protocols to suite the individual athlete's needs as compared to standard protocols.
Participants: Single subject.
Methodology: The rehabilitation began 10 days post surgery with non weight bearing with 45deg knee flexion, brace progressing to independent full weight bearing by 2 weeks. She assumed single leg deep squats and proprioception drills on foam surface in 3rd week. In 4th week, she progressed to single leg wobble board drills and fast stair ascent and descent with 5kg resistance. By the 5th week, she performed light jogs, light plyometrics, endurance training and could train the lower limb against resistance of 6.5kgs. 6th week onwards she started with gym and lower limb training on field. By 8th week she resumed slow running on tracks and gradually increased her speed and distance. She will try and resume sprinting once 8 months are completed.
Analysis: Descriptive comparative analysis of data was done.
Results: At the end of 5 week rehabilitation, she could perform right single leg eyes closed stance and squat for 20s and 50s respectively which was about 45% more than left leg. Her right leg single leg hop, crossover hop and triple hop scores were around 75% that of left leg and Y balance test in three direction reach outs were marginally more than left leg. Her right knee IKDC score improved from 29/100 to 81/100 after 5 weeks rehabilitation.
Conclusion: The highly accelerated protocol was effective to return the sprinter back to track training within 2 months.
Implication: This case study testifies that innovative, experimental individual specific protocol in ACL reconstruction rehabilitation may prove more effective than adhering rigidly to published ones.

Keywords: ACL, Knee ligament injury, Physiotherapy.

AB No 119: Knowledge, attitude and practices on ante-natal exercise among pregnant mothers in Galle municipality area, Sri Lanka
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Introduction: Antenatal exercises bring several benefits to both the mother and to the new born. In spite of known benefits, the practice is at a fairly low level. Assessment of knowledge, attitudes and the practices of pregnant mothers on antenatal exercise and identification of factors associated with practicing antenatal exercises, are useful in adopting and promoting strategies for promoting antenatal exercise.
Objectives: To assess the knowledge, attitudes and practices towards antenatal exercises among pregnant mothers in the Galle Municipality Area of Sri Lanka.
Methods: A descriptive cross sectional study was conducted among antenatal mothers in third trimester permanently residing in the Galle Municipality Area of Sri Lanka using convenient sampling. Data collection was done with an interviewer-administered questionnaire.
Results: Among the 152 participants 25% of mothers who are in their second pregnancy, stated that they are aware of ante-natal exercises. 49% of mothers, who have time to engage in these exercises, stated that they have a liking to engage in these activities. However, 51% of the subjects stated that there is no liking to engage in the activity though they have time. There is a positive correlation between the educational level and awareness of prenatal exercises as the majority (83%) who were aware of the exercises have received education at least up to GCE Advanced Level.
Conclusions: Pregnant mothers' knowledge on antenatal exercises is not at a satisfactory level. Although some pregnant mothers are aware of antenatal exercise, most of them are not willing to practice antenatal exercises.

Keywords: Antenatal exercise, Third trimester, Knowledge, Attitudes.

Day-III Session: Poster Presentation

AB No 43: Comparison of effect of cryotherapy and ultrasound therapy on pain and grip strength in subjects with acute lateral epicondylitis
Authors: Priya Singh Rangey[1], Megha Sheth[2], Romsha Purohit[3]
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Purpose: To compare the effect of Cryotherapy (CFT) and Ultrasound therapy (UST) on pain measure using Visual Analog Scale (VAS) and Pain Pressure Threshold (PPT), Grip strength and Upper Extremity Function Scale(UEFS).
Relevance: Acute Tennis elbow is a vastly prevalent condition. Treatment options vary widely among the physiotherapists including UST and CFT. However, there is no consensus which modality is more effective in the acute stage.
Participants: 20 subjects having acute Tennis elbow since 0-15 days were included. The subjects were diagnosed as having Tennis elbow if they had pain during gripping and weight lifting activities around the lateral epicondyle, tenderness around the lateral epicondyle and reduced grip strength. They were excluded if there was pain at any other site or if they had any radiating symptoms.
Methods: The subjects were divided into 2 groups by random sampling using random number generator – 10 subjects each. CFT was given at 12°C for 10 minutes whereas UST was given for 5 minutes at 0.5 W/cm2 with 1:1 pulsed ratio using 3 MHz for 5 days. No exercises or manual therapy were given along with the modalities.

Analysis: Wilcoxon test was used to analyze the difference within each. Mann-Whitney U test was used to analyze the difference between the 2 groups.
Results: There was a statistically significant difference in both the groups before and after the interventions for all the outcome measures [(p=0.005, p=0.0005 for VAS)(p=0.008, p=0.047 for PPT),(p=0.005,p=0.005 for UEFS) and (p=0.025,p=0.005 for grip strength)for CFT and UST groups respectively]. There was no statistically significant difference between both the groups for VAS (p=0.123), PPT (p=0.739), UEFS (p=0.971) and grip strength (p=0.631).
Conclusion: There is no statistically significant difference between CFT and UST interventions for pain, grip strength or upper extremity function.
Implications: The two modalities can be used interchangeably. Hence, when a subject cannot tolerate low temperatures, UST can be used for acute Tennis elbow.

Keywords: Tennis elbow, Ultrasound, Cryotherapy, Cryo flow.

AB No 59: The effects of age and gender on cervical range of motion- A longitudinal study
Authors: Pavel Ghosh, Shabnam Agarwal, Tapas Pal
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Purpose: To determine the effects of age, gender and time on active cervical ROM in an asymptomatic Indian population in order to provide a normative database for longitudinal clinical trials intending to use cervical ROM as an impairment measure.
Participants: 201 (100 males; 101 females) (30/decade) asymptomatic Indian participants (age range 20-89 years) were measured for active cervical ROM.
Methodology: Approximately 30 subjects were measured per decade for active cervical ROM (flexion, extension, lateral flexion and rotation bilaterally) conducted at baseline, 1 and 3 months. The Spin-T goniometer was used for all assessments of cervical ROM.
Analysis: The effects of age were analysed for each decade by linear regression analysis. Differences between genders were calculated with an unpaired t-test. Reliability of repeat measures of cervical ROM, baseline to 3 months was analysed using the ICC 3, 1. The probability of $p < 0.05$ was considered significant.
Results: The study showed the maximum loss in mean cervical extension (3°/decade) followed by all other movements (2°/decade) and least in the lateral rotation right (1.5°/decade). Differences between genders were not statistically significant ($p<0.05$). For repeat measurements at 3 months, the ICC (3, 1) (baseline vs 3 months) was > 0.8.
Conclusion: This study is the first to provide data on cervical AROM in an asymptomatic Indian population (2nd to 8th decade). From the results of this study, it may be concluded that active cervical ROM had a significant relationship with age but not with gender. Reliability of repeat measurements at 3 months interval of cervical AROM yielded acceptable repeat measure reliability.
Implication: The results of this study have implications on longitudinal clinical trials aiming to use cervical ROM as a measure for impairment outcome or determine treatment efficacy.

Keywords: Cervical range of motion, Asymptomatic Indian population, Spin-T goniometer.

AB No 60: Effects of burst tens over upper trapezius trigger points- A pilot dosimetry study
Authors: Soumyadeep Roy, Tapas Kumar Pal, Tanusree Basak, Anwesh Pradhan, Shabnam Agarwal
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Purpose: To find the duration of Burst TENS to dissolve the upper trapezius myofascial trigger points (MTrP).
Relevance: We investigated the effect of burst-type TENS by application of 5 sessions, on pain pressure threshold (PPT) and cervical contra lateral flexion range of motion (ROM). This study aimed to improve pain and ROM in people suffering with trigger points in their bilateral upper trapezius muscle.
Participants: 10 participants (n=10) of both sex within the age group of 18-30 years were included. Subjects were included if were diagnosed of bilateral latent or active MTrP.
Methods: The subjects were treated with burst-TENS with a pulse width of 200μs, frequency of 100Hz, and a burst frequency of 2Hz were applied for 20 mins.
Results: The PPT and ROM was measured before the treatment, after completion of 5 days treatment and follow up after 15 days. Student t test showed significant increase in PPT and ROM ($p<0.05$) after 5 days of treatment. On 15 days follow up 9 out of 10 patients turned in and 1 patient dropped out, and mean PPT values in follow-up were signifying same pain status even after 15 days, but there was decline in ROM.
Conclusion: Five sessions of burst type TENS had hypoalgesic effects over MTrPs in bilateral upper trapezius and improvement in bilateral cervical lateral flexion ROM and improved pain status on follow-up.
Implication: Further study is needed to see combined efficacy of another treatment protocol. Also there is a need to include home based exercise program to see the improvement in ROM of post follow up.

Keywords: MTrPs, Upper Trapezius, Burst-TENS.

AB No 63: Unresponsive wakefullness syndrome: non-invasive electrical stimulation in unconscious disorders- A systematic review

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Background: Coma is the state of deep sleep or unconsciousness. Sensory stimulation is intended to promote awakening and enhance the rehabilitative potential of coma patients. The use of sensory stimulation and the non-invasive methods for coma has gained popularity but beliefs and opinions about its effectiveness vary substantiality among health professionals, therefore the studies were performed to explore the underlying brain responses of patient in coma.
Objectives: To retrieve the literature regarding the effectiveness of non-invasive electrical stimulation in unconscious disorders.
Methodology: Data identification - Data was searched from Cochrane Library, Google scholar, PUBMED, RESEARCH GATE from 2001 to January 2017, with the English language limitations. Selection criteria- RCT's and crossover trials were assessed for eligibility. Out of which 10 trials were excluded due to the Ineligible outcomes, population and studies included in qualitative synthesis were 16. Originally identified articles were selected that specifically addressed the purpose.
Data extraction: Three Observers assessed the studies using clear approaches for evaluating the quality of the articles
Inclusion criteria: RCT's focused on sensory stimulation, non-invasive methods in coma patients irrespective of gender and age.
Exclusion criteria: Deep brain stimulation and traditional methods of coma arousal therapy the databases were searched for the search terms like: coma, electrical stimulation, Arousal therapy, non-invasive methods.
Result: The review gathered the literature regarding the use of the non-invasive methods like the right median nerve stimulation, trans cranial direct current stimulation (tdcs), RTM, and the other rational methods have noticeable changes in the patients outcome measures
Conclusion: These methods have confirmed their effectiveness. It is an effective and non-invasive technique to promote the recovery in the coma patients.

Keywords: Coma, Vegetative state, Sensory stimulation, Non- invasive methods, Consciousness.

AB No 65: Effect of saebo glove on hand functions in patient with chronic stroke: Single case study

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Background: Stroke is the most prevalent disabling neurological disease. One of the most common consequences of stroke is a loss of motor function contralateral to the vascular lesion. Hand and arm impairment is common after stroke. Saebo device helps patient suffering from neurological conditions. The proprietary tension system extends the fingers and thumb following grasping so individual can incorporate their affected limb functionally. This new found freedom leads to improved motor recovery and functional independence.
Aims: This study aims to find out the effect of saebo glove on motor impairment in hand function in patient with chronic stroke.
Case Description: This paper describes a case of 65 Years old Male, diagnosed with Right CVA. 3 Years ago, weakness started in his left side with difficulty in performing hand movements and in walking. Neurological examination elucidated that there was no sensory impairment, however upper extremity weakness was more than lower extremity. Saebo glove along with conventional physiotherapy treatment were given for 4 days for 40 minutes. Pre-post intervention assessment was done using FUGL-MEYER(FMA-UE) assessment for improvement in upper extremity and Manual Dexterity, Hand Grip and Pinch Grip Strength(lateral pinch, chuck pinch and pulp pinch) measurement for improvement in hand function.
Result: Significant improvement was observed in score of FUGL-MEYER (Pre-Post intervention score respectively 39/60, 40/60) and timing of Manual Dexterity.
Conclusion: It can be concluded that there is an immediate effect of saebo glove on motor function in hand in patient with chronic stroke.

Keywords: Saebo glove, motor function, chronic stroke.

AB No 66: Which exercise forms are safe and effective to improve fitness in adult asthmatics? A critical appraisal of published evidence from clinical practice guidelines (CPGs) and systematic reviews (SRs).

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Purpose: To synthesize the highest quality evidence available to guide exercise prescription for adult asthmatics.
Relevance: Asthmatics commonly don't exercise to recommended levels, dyspnoea being a limiting factor.

Participants: Clinical practice guidelines (CPGs) or systematic reviews (SRs) published within the past 10 years, relevant to adult asthmatics, describing exercise interventions and including fitness outcomes were included.
Methods: CPGs and SRs were identified using Pubmed and Google Scholar searches. Guideline and review quality were assessed via iCAHE and AMSTAR appraisal tools respectively. Exercise interventions and outcomes were compared across primary studies included in each guideline or SR.
Analysis: Descriptive synthesis of safe and effective exercise forms. Interventions were summarized according to type, dosage and duration. Safety was judged via reports of adverse events and effectiveness was judged by significant benefit to intervention versus control groups in at least one fitness outcome.
Results: There were no CPGs specific to exercise in asthmatics. However 2 relevant guidelines were identified: British guidelines for asthma management and guidelines for physiotherapy of lung conditions, both including sections on exercise for asthma. Four SRs including exercise in asthmatics were identified; one was specific to adults. A further two SRs investigated different forms of exercise in COPD. CPGs and SRs were generally of moderate quality. A total of 21 primary studies of adult asthmatics were summarised across the guidelines and reviews. Continuous aerobic training was the most common exercise form and was safe and effective in asthmatics. Interval and resistance training were equivalent to continuous training in COPD; resistance training also included improvement in functional activity.
Conclusion: Whilst further research is required to ascertain the most effective forms of exercise for fitness in asthmatics, continuous, interval and resistance training are all safe to implement.
Implications: Physiotherapists can apply evidence based guidelines to design fitness programs for asthmatics.

Keywords: Exercise, Asthma, Clinical practice guidelines.

AB No 69: Does physiotherapy awareness help people suffering from musculoskeletal pain in India?

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Purpose: Evaluating Physiotherapy awareness and did persons with musculoskeletal pain considered Physiotherapy as a treatment option.
Relevance: In India, there is severe data scarcity regarding pain and awareness of physiotherapy management in pain. Therefore, we assessed point prevalence of pain and how Physiotherapy was considered as the treatment for pain management.
Participants: Stratified random sampling approach was used for persons above 18-years from Surat zones.
Method: Cross-sectional survey method with door-to-door, one-on-one personal interview of 774 participants was used. Questionnaire assessed demography, prevalence of pain, frequency, sites of pain, Physiotherapy awareness, and Physiotherapy treatment taken for pain problems.
Analysis: Cross tabulation analysis was conducted to assess prevalence of pain. Logistic regression analysis was used to evaluate association of pain and physiotherapy awareness.
Results: Total point prevalence of pain was 60.21%. Pain in back (47%), knees (37.8%), neck (15.5%), shoulder (13.9%) were most common. Female (66.67%) were more likely to exhibit pain than males (49.66%). Only 19.53% of persons with pain took physiotherapy. Overall, 70.16% persons were aware about Physiotherapy but only 25.21% took Physiotherapy for their pain. 28.8% persons with pain didn't utilize Physiotherapy for their pain, in-spite of being aware about its role. Of these, 43.7% reported lack of time, 17% were not recommended Physiotherapy by doctors, 15.6% were satisfied with symptomatic pain relieving ointments-pain killers, and 12.6% had financial issues. Physiotherapy adds life to years and though its existence in India since decades still remains underutilized treatment for musculoskeletal pain. Our study states that reasons for not taking Physiotherapy are modifiable. With proper educational and awareness campaigns for persons with pain and other healthcare professionals, we can enhance the role of Physiotherapy for pain management.
Implication: In India due to paucity of evidence, this type of studies can help us to correlate awareness of physiotherapy with pain.

Keywords: Pain, Physiotherapy awareness, Indian community.

AB No 87: Acceptability and attitude towards mobile-based home exercise program among stroke survivors and their caregivers

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Purpose: Stroke is a leading cause of disability and requires continued care after hospital discharge. Mobile-based interventions are suitable to reduce cost of rehabilitation and facilitate self-management among stroke survivors. However, before attempting to use mobile-based home exercise program, it is crucial to understand the readiness to opt for this intervention among the stroke survivors and their caregivers.
Relevance: Understanding the readiness will help in appropriate implementation program.

Participants: Stroke survivors and their caregivers
Methods: A cross-sectional study using a questionnaire was conducted among 102 participants to understand their attitude and acceptability towards mobile-based home exercise program. The questions which assessed the attitude were rated on a five-point Likert scale.
Analysis: The acceptability was assessed by their willingness to opt for a mobile-based home program services. A Chi-square analysis, logistic regression and cross-tabulation were performed.
Results: Ninety-two percent of caregivers and 90% of patients showed a willingness to opt for mobile-based intervention. There was no difference in the attitude of caregivers and patients ($p>0.05$) towards mobile-based intervention.
Conclusion: The stroke patients and caregivers welcome the concept of mobile-based home exercise programs even in a low-resource setting.
Implications: Future studies should target treatment and cost-effectiveness of this technology among the community-dwelling stroke survivors.

Keywords: Tele rehabilitation, Hemiplegia, Technology.

AB No 89: Efficacy of Kinesio taping on functional outcomes in patients with subacromial impingement syndrome

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http://doi.org/10.18231/j.jsip.2019.080

Purpose: Subacromial Impingement Syndrome (SIS) is a common disorder of the shoulder, resulting in functional loss and disability. Kinesio Taping (KT) is an extensively used therapeutic modality to treat neuromusculoskeletal injuries. However, there is inadequate literature regarding the effects of KT on functional outcomes in SIS. This study aims to determine the efficacy of KT on activities of daily living in individuals with SIS, in adjunct to conventional therapy.
Relevance: Functional outcomes are often limited in SIS owing to pain and weakness. Hence a therapists' primary goal becomes to ease patients' activities of daily living. The present study, which is under progress, aims to determine the efficacy of KT on function and strength.
Participants: A pilot study was undertaken to determine the effects of KT on function and strength. Participants within the age group of 25-65 proving positive for Neer's and Hawkin's Kennedy test are included while other shoulder pathologies, fractures or post-surgery are excluded.
Methodology: Participants were randomized into case and control groups. Case group received KT taping with conventional therapy, while the control group received sham taping with conventional therapy. Disability of arm, shoulder and hand (DASH) questionnaire was used to assess the functional outcomes pre and post. Strength of shoulder flexors, abductors, internal and external rotators was assessed using a dynamometer.
Analysis: Paired t-test was used to compare the means within and between groups.
Results: The initial results revealed a significant difference within the group for function ($p= .003$). There was also a significant difference in strength, flexors ($p = 0.009$) abductors ($p= 0.1$) Internal rotators ($p=0.017$) External rotators ($p=0.007$) within group.
Conclusion: These results prove the efficacy of KT on SIS, however, to understand the robustness of KT the study will further explore if these differences are significant between sample and control groups.
Implications: KT may be a feasible option for treatment of patients with SIS.

Keywords: Impingement, KT, Functional outcome.

AB No 92: Burnout in physiotherapy professionals working in Delhi-NCR region

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Purpose: To determine the level of burnout and assess factors associated with it in physiotherapists working in Delhi- NCR
Relevance: Globally, chronic stress in the work environment is one of the leading factors for burnout syndrome. Physiotherapy is one of the high demand health care profession which includes not only physical but also mental stress. Though it has great impact on professional life, burnout in India is a neglected area of research.
Participants: Professionally active physiotherapists in the age range of 21-60 years
Method: A demographic questionnaire and Burnout Clinical Subtype Questionnaire-36 was administered to physiotherapist who consented. Survey Monkey was used as a vehicle to send the questionnaire to physiotherapists. Two reminders were sent to ensure maximum participation.
Analysis: The data was compiled and analyzed by SPSS version 16.0 with descriptive statistics, t-Test.
Result: Out of 53 valid responses, around 66.7% respondents were post graduate, 68% had more than 5 years of work experience, working in educational set up (57.4%). The highest mean score was found for Frenic subtype (4.90 ± 1.08) followed by Worn-out subtype (3.01 ± 0.89) finally by Under-challenged (2.65 ± 0.96). Further, around 52.8% of total respondents were overloaded. Female therapists are significantly more involved ($t= 1.39$ $p < 0.05$) and Ambitious ($t=0.46$, $p< 0.05$) as compared to male physiotherapists
Conclusion: Physiotherapists from Delhi NCR are demonstrating more of Frenic subtype- burnout. Most of the Physiotherapists overload themselves; risking health and neglect personal lives in the pursuit of good results. Females

are more involved and show individual's disregard as a common response to most difficulties.
Implication: Appropriate measures must be taken to reduce the burnout so that the efficiency of the physiotherapists will be maintained and risk of exhaustion will be minimized. This will improve quality of healthcare.
Keywords: Burnout, Physiotherapists, Delhi-NCR.

AB No 94: Effectiveness of dry needling in treatment of tennis elbow and improvement in grip strength
Authors: Saachi Varyani, Diana Pinto, Prachi Kulkarni
Affiliation: Physiotherapy and Pain Management Clinic.

http://doi.org/10.18231/j.jsip.2019.082

Purpose: To study effectiveness of dry needling in treating tennis elbow and also improvement in grip strength.
Relevance: As per our assessment, there is no valid research conducted on effectiveness of dry needling in treating tennis elbow pain or the improvement of grip strength in tennis elbow through dry needling.
Participants: 25 individuals were included in the study having NON TRAUMATIC tennis elbow pain. (Both dominant and non-dominant hand having tennis elbow were included)
Methods: Grip strength was measured for the painful and non painful arms in 5 PRE-DECIDED POSITIONS with the help of hand held dynamometer. The pre needling values for the two consecutive treatment sessions for the painful arm were compared with each other.
Analysis: T test is used for the statically analysis or of the recorded data. Results: There was a statistically significant improvement in grip strength and the VAS score.
Conclusion: Dry needling along with reducing the pain in tennis elbow helped in improving the grip strength in individuals
Implications: To study effectiveness of dry needling in improving Grip strength for tennis elbow.

Keywords: Dry needling, effectiveness, tennis elbow, Grip strength.

AB No 95: Effect of aerobic and progressive resistance training on functional capacity and quality of life in head and neck cancer patients receiving chemoradiotherapy.
Authors: Tandra Rachana Reddy, Stephen Rajan Samuel, Gopal Krishna Alaparthi, PU Prakash Saxena, Ravi Shankar N
Affiliation: Manipal Academy of Higher Education.

http://doi.org/10.18231/j.jsip.2019.083

Purpose: Lack of retrievable data regarding the combination of aerobic and resistance training in head and neck cancer patients receiving chemoradiotherapy.
Relevance: To ascertain the effect and feasibility of aerobic cum resistance training program in head and neck cancer patients receiving chemoradiotherapy.
Participants: Study participants included patients with head and neck cancer planned for chemoradiotherapy. Eastern Cooperative Oncology Group (ECOG) score <2. Age: ≥18yrs, including both the genders. Exclusion criteria - Patients with severe orthopaedic and neurological problems. Inability to comply with study procedures. Patients contraindicated to exercise training. Platelet count :< 30000/µl, Hb count :< 8gm/dl
Methods: Study design: Case series, Sample size: 10, Sampling method: Convenience sampling, Interventions: Aerobic training (Brisk walking for 15min, 5days a week for 7 weeks) combined with progressive resistance training (strengthening with Thera-band for 15minutes, 3days a week for 7 weeks for major muscle groups).
Analysis: Descriptive analysis
Results: The mean 6 minute walk distance at baseline was 414.50 meters and at the end of seventh week mean six minute walk distance was 356meteres; FACT H&N baseline mean was 112 and end of seventh week mean was 88.80; Skeletal muscle mass at baseline was a mean value of -28.70 and end of seventh week the mean value was 26.40.
Conclusion: A combination of aerobic & Progressive resisted training in patients undergoing chemoradiotherapy for head and neck cancer patients is feasible, and helps to maintain skeletal muscle mass and functional capacity. In addition this exercise program prevented a steep decline in quality of life in this patient population.
Implications: The study will help us to prescribe an exercise programme for head and neck cancer patients receiving chemoradiotherapy. This study will also help in planning a future randomized controlled trial comparing various modes of exercise for this patient population.

Keywords: Head and neck cancer, Exercise, Chemoradiotherapy.

AB No 106: Current practices in gait training for stroke survivors among Indian physiotherapists: A cross sectional survey
Authors: Sanjana Gururaj, Manikandan N and John Solomon M
Affiliation: Manipal Academy of Higher Education.

http://doi.org/10.18231/j.jsip.2019.084

Purpose: 1. To develop and content validate a questionnaire for assessing current practices in gait training for stroke patients. 2. To conduct a survey among physiotherapists practicing in India using the validated questionnaire.
Relevance: Most developed countries have standardised guidelines and protocols for stroke rehabilitation. There is lack of such guidelines in India and establishing the same may improve quality of care. As a prelude to this, an understanding of the current management practices that are

followed by physiotherapists in the field of gait rehabilitation is essential.

Participants: Approximately 300 physiotherapists practicing in India, identified via snowball sampling.

Methods: Phase 1: Current literature regarding the various aspects of gait training was collected, relevant components chosen and converted into questions. A questionnaire with 33 questions was constructed and content validated by 5 experts in the field of neurorehabilitation. Phase 2: Cross sectional online survey conducted using the validated questionnaire.

Analysis: 179 responses considered for quantitative analysis.

Results: Preliminary results showed that despite recent advances highlighting the importance of early intervention, 32.4% of the physiotherapists initiate gait training after 7 days. Majority of the participants provide gait training for about 15-30 minutes (56.4%), once daily (44.7%). Although most physiotherapists agree on using assistive aids while training gait, 28.5% do not feel the need to use them. We also found that 80.4% of the physiotherapists do not follow any guidelines pertaining to gait rehabilitation. However, 95% feel the need to develop guidelines specific to India.

Conclusion: We look forward to more responses from practicing physiotherapists and hence await the conclusion.

Implications: To develop uniform guidelines and resources for better management and improved recovery in stroke survivors, an understanding of the current management being followed by physiotherapy professionals is essential. In addition, this may promote evidence-based practice and help in improving standards of care in physiotherapy departments for gait training programs.

Keywords: Hemiplegia, Walking, Rehabilitation.

AB No 113: Feasibility of implementing a cardiac rehabilitation algorithm in patients following percutaneous coronary intervention – A preliminary report

Authors: Akhila Satyamurthy[1], Nivedita Prabhu[2], Ramachandran Padmakumar[3], Abraham Babu[4]

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Purpose: India witnesses a lack in density of cardiac rehabilitation (CR) centers and utilization. With the growing trend of percutaneous coronary interventions (PCI), determining the feasibility of CR programs is paramount. Thus, the objective of this study was to determine the feasibility of the CR algorithm proposed in the national guidelines. Secondary: To assess the benefit of CR on 30-day-outcomes

Objective & Relevance: With the growing burden of coronary artery disease in India and with PCI being the first choice of intervention, CR is yet to become standard care, despite its recommendation in the current national guidelines.

Participants: Participants who underwent their first PCI were included. They were excluded if they had class IV symptoms, musculoskeletal conditions limiting rehabilitation and ejection fraction (EF) < 40%.

Methods: A prospective feasibility study was conducted on patients undergoing PCI. Phase I CR was administered, as per the algorithm proposed by the Cardiology Society of India, till discharge. At discharge, an individualized home exercise program for 1 month was given and patients followed up after 30 days. Feasibility of the program was assessed using various metrics (scientific, process, resource and process). 30-day outcomes related to clinical and functional outcomes (six minute walk test and quality of life) were recorded.

Analysis: Demographics were summarized using descriptive statistics and paired t-test were used to analyze the changes in functional outcomes.

Results: 30 patients (mean age 56±12.4yrs, 24/30 male) with normal left ventricular function (52±9.4) enrolled into the study with an average length of stay of 3±0.86 days. A 100% cardiologist referral rate with a 33% (10/30) refusal rate was observed. Among the 20, the program took 14.2±7.4min/session on the initial day and reduced to 13.2±8.2 min/session. Out of the 20, 11 patients completed follow up and 4 were loss to follow up. Despite this, trends towards improvements were seen in functional outcomes after 30-days with no mortality, worsening of symptoms and acceptable quality of life.

Conclusion: The CR algorithm proposed by the Cardiology Society of India is feasible and produces improvements in function and clinical outcomes.

Implication: The CR algorithm is simple and easy to implement by physiotherapists across various clinical settings. The algorithm produces benefits in terms of function and quality of life.

Keywords: Feasibility, Cardiac rehabilitation, Cardiovascular disease, Quality of life.

AB No 115: Prevalence of physical activity in older adults in Delhi-NCR

Authors: Ashna, Sampada S. Jahagirdar, Astha Jain

Affiliation: Amar Jyoti Institute of Physiotherapy.

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Purpose: To determine the level of physical activity in older adults residing in Delhi-NCR.

Relevance: In spite of the rising importance of physical activity in prevention and management of lifestyle disorders and Quality of Life in older adults, it remains a neglected area of research in healthcare. To date there is dearth of statistics regarding the level of physical activity level in India, especially in the northern region.

Participants: 204 community living adults aged 50-65 years old with cut off scores of Dynamic gait index (DGI) ≥19/24 and Mini Mental State Examination (MMSE)

≥24/30. People with any neurological and cardio-respiratory disorder that impact balance or mobility were excluded from the study.
Methods: Consenting adults in the required age category were first screened for inclusion and exclusion. English and Hindi versions of International Physical Activity Questionnaire-Short form (IPAQ-S) were then administered on each one of them as per there language preference.
Analysis: Descriptive statistics using MS Excel.
Results: 74 females and 130 males participated in the study. As per the scoring guidelines of IPAQ-S, 33 (14 females, 19 males) subjects had a score of ≥3000MET min/week, 150 (48 females, 102 males) subjects had a score of 600-2999 MET min/week and 21 (12 females, 9 males) individuals had less than 600 MET min/week.
Conclusion: Majority of the older adults in the age group of 50 to 65 years had moderate and low physical activity level which is less than the WHO's recommended level of 4200 MET min/week. Also, older women tend to be less physically active than their male counterparts.
Implication: The findings of the study are a great insight of the present scenario on physical activity in older age. It implies creating more research and interventions in this area.

Keywords: Physical Activity, Older-Adults, DGI, MMSE, IPAQ-S.

AB No 117: Scapular Dyskinesis in collegiate overhead athletes

Authors: Sama Khedgikar and Kavitha Vishal
Affiliation: School of Allied Health Sciences, Manipal Academy of Higher Education.

http://doi.org/10.18231/j.jsip.2019.087

Purpose: To determine the prevalence of Scapular Dyskinesis in Collegiate Overhead Recreational Athletes.
Objective: Influence of gender and Hand dominance on Scapular Dyskinesis.
Relevance: Scapular Dyskinesis (SD) is a condition responsible for alteration of the normal position and kinematics of the scapula which may further lead to possible impairment of overall shoulder function. SD has been associated with the development of shoulder pain, specifically shoulder impingement syndrome (SIS), rotator cuff tendinopathy and multidirectional impairments. It is a common finding among overhead athletes with and without shoulder injuries. The prevalence of SD in elite overhead athletes is well established, however reports of its prevalence in recreational athletes is scarce.
Participants: Individuals involved in a range of recreational overhead sports were recruited according to the inclusion and exclusion criteria. A total of 100 participants were recruited.
Methodology: 1) Procedure was explained to participants and written informed consent was taken. 2) Age, gender, hand dominance was noted 3) Scapular Dyskinesis was measured using two tests. The Scapular Dyskinesis Test (McClure et al. 2009) and Lateral Scapular Slide Test (Kibler WB 1998)
Analysis: Quantitative Analysis was done using Excel sheet.
Results: Prevalence for SD out of 100 participants was found to be 45%. Out of 43 female participants 27 were positive for SD and, Out of 57 male participants 18 were positive for SD. Prevalence according to hand dominance: Dominant side-16%, Non dominant side-17% and both sides-12%.
Conclusion: The prevalence of SD In collegiate overhead athletes was found to be 45%, SD was found to be higher in females when compared to males. There seems to be no influence of hand dominance in the presentation of SD
Implication: There is a need to screen collegiate overhead athletes, to prevent shoulder dysfunction in future.

Keywords: School of Allied Health Science, Manipal Academy of Higher Education.

AB No 55: Prevalence and risk factors of upper back pain among heavy vehicle drivers in galle district, southern province, Sri Lanka

Authors: Hiruni Gjanayaka and Nipun Jayakody
Affiliation: International Institute of Health Sciences - Sri Lanka.

http://doi.org/10.18231/j.jsip.2019.088

Purpose: To assess the prevalence and risk factors of upper back pain among heavy vehicle drivers in Galle district.
Relevance: Prevalence of musculoskeletal disorders (MSD) among drivers is a common issue at present. Various factors such as driving for long hours, seating arrangement and posture can affect the drivers to get Musculoskeletal Disorders. Professional drivers are a high-risk group for musculoskeletal disorders involving the spine, shoulder, back, neck, knee and pains in upper and lower extremities. Significant amount of drivers have stated that they have back pain which caused because of their occupation. Therefore it is necessary to make them aware about maintaining proper posture and ergonomics in order to relieve symptoms. Also it is important to provide physiotherapy as needed.
Participants: conveniently selected sample of 80 heavy vehicle drivers in Galle district who had not faced road traffic accidents and diagnosed with neurological pathologies.
Method: A descriptive cross sectional study was done using a self-administered questionnaire.
Analysis: qualitative study was done and analyzed using SPSS.
Results: According to the results founded, 77.8% of the drivers drive for more than 6 hours per day. 63% of them had numbness in their neck and shoulder area. 54% of them stated that the pain affects their carrier. 62% out of them stated that they get upper back pain while driving. 47

participants have stated that they get upper back pain mostly on the following day after a drive. Majority of them (64%) do not keep any back support and they lean to the seat while driving. Only 32% of the participants had sought medications for their conditions. Majority of them have used home remedies for their musculoskeletal pain without seeking any medical advice.

Conclusion: According to this research heavy vehicle drivers are more prone to get MSD. Among heavy vehicle drivers, upper back pain is one of the most commonly identified MSD. Driving for long hours and the wrong sitting posture are the most common risk factors for upper back pain among heavy vehicle drivers.

Implications: Educate the drivers regarding neck and back pain, educate about maintaining good posture. Moreover evaluation of seating facilities of the heavy vehicleto reduce the abnormal postural effects can be concerned. As well as promoting physiotherapy practice among heavy vehicle drivers.

Keywords: Muscular skeletal disorders, Upper back pain, Heavy vehicle drivers.

AB No 120: Identification of accessibility gaps for wheelchair-bound passengers using railway as a mode of transportation from Colombo to Gampaha railway stations, Sri Lanka – 2018

Authors: Yasara Eirimanne, Asini Kuruppu
Affiliation: IIHS, Sri Lanka.

http://doi.org/10.18231/j.jsip.2019.089

Introduction: Railway is one of the major transportation methods which is being used for number of decades. However, it is not evident that how far disabled people can use railway as their main transport mode. It is identified that the disabled people use railway transport minimally when compared to other modes. Therefore, it is important to identify the reasons behind that and implement strategies to overcome the identified barriers. The purpose of the study was to find out the accessibility gaps for wheelchair-bound passengers in railway transport and to find solutions for the same.

Methodology: This was an observational study carried out in 15 stations from Colombo to Gampaha and mini interviews were carried out with passengers. Accessibility gaps were identified during observation and mini interview stages.

Results and Discussion: Out of all the 5 major types of trains, only two types were accessible for wheelchair-bound passengers. Out of all the 15 stations, only Ganemulla and Bulugahagoda stations were accessible. Even though Maradnaand Fort stations were identified as major stations, they lacked wheelchair access to most of the platforms and the platform height varied irrespective of the new constructions. Platform heights varied from 60cm (2nd platform, Horape) minimum to 220cm (2nd platform, Kelaniya) maximum. The standard wheelchair width is 23.5 inches and minimal doorway width should be 32 inches. However, according to the trains selected, S10 and S11, the doorway widths were only 22.5 inches and 23 inches respectively.

Conclusion: It was revealed that railway is not an accessible transportation mode for wheelchair-bound passengers. Hence, introducing modified train compartments is highly necessary in accordance with standard wheelchair measurements.

Keywords: Disabled, Accessibility gap, Train railway, Wheelchair.

Reviewer Guidelines

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Journal article

1. Prabhat J, Jaynath M, Jaggi KJ. Evaluation of patients for pain modalities: medical and behavioral assessment. *Clin J Pain* 2001;17:206-214.

Book chapter

2. Todi VR. Visual information analysis: frame of reference for visual perception. In: Kramer P, Hinojosa J, eds. *Frames of reference for pediatric occupational therapy*. Philadelphia: Lippincott Williams & Wilkins, 1999:205-256.

Entire book

3. Kapoor RM, Martin LJ. *Atlas of craniomaxillofacial fixation*. Philadelphia: Lippincott Williams & Wilkins, 1999.

Software

4. *Epi Info* [computer program]. Version 6. Atlanta: School of Prevention of Diseases,1994.

Online journals

5. Fast ST.: a review of the role of prostaglandins. *Obstet Gynecol* [serial online]. January 1988;71:22-37. Available from: BRS Information Technologies, McLean, VA. Accessed December 15, 1990.

Database

6. CANCERNET-PDQ [database online]. Bethesda, MD: National Cancer Institute; 1996. Updated March 29, 1996.

World Wide Web

7. Govinda LO. Drug use and HIV/AIDS [*JAMA* HIV/AIDS Web site]. June 1, 1996. Available at: http://www.ama-assn.org/special/hiv/ethics. Accessed June 26, 1997.

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