KG NEXUS - 2022

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Message from Chief Editor,

K.G. Hospital & Post Graduate Medical Institute is a multi-speciality not-for-profit tertiary care hospital. KG Hospital (KGH), run by K. Govindaswamy Naidu Medical Trust, was founded in 1974 by 'Dharma veera' K. Govindaswamy Naidu, a leading industrialist and philanthropist from Annur village in Coimbatore district. By following the Footsteps of his father, Dr. G. Bakthavathsalam, the hospital has set many milestones in healthcare services. For the services, Dr. G. Bakthavathsalam has received a plethora of awards, of which Dr. B. C Roy Award from Prime Minister Mr. Rajiv Gandhi (1984) and Padma Shri from the President of India (2005) was prestigious.

It started as a 25-bed hospital in 1974; the hospital is today a 350-bed multi super specialty high-tech hospital offering a variety of healthcare services. For 48 years, KGH has been a trendsetter in healthcare, providing advanced yet affordable healthcare to all. As an NABH accredited hospital, KGH has treatment options conforming to international standards in all specialities. The hospital has achieved EXCELLENCE by performing breakthrough surgeries of a high order, including AWAKE HEART SURGERY, dialysis of a new born baby, kidney transplant from a brain dead victim by transporting him from Trivandrum in our Responder 2000 and MULTI ORGAN CADAVER SURGERIES. KGH was the first hospital in ASIA to install a 128 slice cardiac CT. Today, KGH remains at the cutting edge of healthcare - for example, it is the only hospital in Coimbatore performing minimally invasive cardiac surgeries.

KG College of Health Sciences, Coimbatore run by K. Govindaswamy Naidu Medical Trust, Coimbatore, in Tamil Nadu is affiliated to Dr.MGR Medical University, Chennai and Directorate of Medical Education, Kilpauk, Chennai. The aim of KG College of Health Sciences is to prepare a health care provider to function

as a member of the healthcare team, bringing competency to the hospital and the community.

KG College of Physiotherapy is committed to being excellent in education and offers its students the advantage of high quality academic programs with distinguished faculty and exceptionally good facilities fostered by KG Hospital. The College was started in the year 1998 with Bachelor of Physiotherapy Course followed by Master of Physiotherapy course in the year 2004 and a Ph.D in Physiotherapy in the year 2020 by the initiator of the institution Padma Shri Dr. G Bakthavathsalam – Chairman, and is running successfully in its 24th year. Physiotherapy is a very important aspect of medicine. For every field of medicine be it a surgery whether it is Orthopaedics, Neurology, Neuro Surgery or else Spine Surgery – Physiotherapy is an integral part of the treatment. Even the surgeon does the successful joint replacement surgery; the physiotherapist has to spend two to three months of time to make the patients mobile without pain. Physiotherapy, I always called it as very highly integrated and talented professions without using drugs and injections, they relieve pain and sufferings.

KG College of Physiotherapy conducted various Scientific Conferences; Sports meet from the very beginning. Recently in the year 2019, we have conducted the First Intercollegiate Physiotherapy meet including Scientific Conferences, Sports and Cultural events with around 350 participants. The next year 2020 we have planned for it but because of COVID pandemic we couldn’t able to do it. But once the situation changed we were ready to conduct the 2nd National Intercollegiate Physiotherapy Meet named 'KG Nexus - 2022' at KGISL Campus, Saravanampatti, Coimbatore on 22, 23, and 24 April 2022. 3000 students from 46 physiotherapy colleges from states like Tamil Nadu, Kerala, Karnataka, Andhra Pradesh, and Pondicherry attended. Coimbatore City Commissioner of Police Mr. Pradip Kumar, IPS presided over the inauguration ceremony held on April 22 at KGISL Grounds. On April 24th, the valedictory function was inaugurated by Padmashri Dr. G. Bakthavathsalam - Chairman with the presence of Vice-chairman Mrs. Vasanthi Raghu, Dr. Arun Kumar, Dr. Nalanda of KG Hospital. 85 physiotherapists who have contributed much to the field of Physiotherapy were recognized with Awards.

Trophies and Medals were given to the Overall Scientific events, Cultural events, Sports events, the Overall Winner, Overall Runner up teams.

The main motto of this KG NEXUS – 2022 SCIENTIFIC CONFERENCE PROCEEDINGS is to create a platform for the students and encourage the participants of the Paper and Poster presentations to publish their work in a well structured platform. Through research and documentation, I believe it is now up to us, the physiotherapists, academicians, and students, to continue the expansion of knowledge and develop new and innovative approaches to comprehend physiotherapy.

Padma Shri Dr. G. Bakthavathsalam

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Preface

This KG NEXUS-2022 SCIENTIFIC CONFERENCE PROCEEDINGS will be a great moment for KG College of Physiotherapy, as it is the first step towards a greater goal for physiotherapy education. The encouragement to learn and partake in research can only further fuel the students towards becoming better practitioners. The Goal behind writing this book is to encourage the students and staff to do research and document the findings. So that it would be useful in the future.

Acknowledgement

First and foremost we wish to acknowledge our heartfelt gratitude to the Lord Almighty for his divine blessings and guidance throughout this endeavour.

We are very much glad to our Chief Editor of the KG NEXUS – 2022 SCIENTIFIC CONFERENCE PROCEEDINGS, our Padma Shri Dr. G. Bakthavathsalam, Chairman KG Hospital.

We extend our thanks to our beloved Mrs. Vasanthi Raghu - Vice Chairman, KG Hospital, Mr. Ashok Bakthavathsalam – Managing Director, KGISL and Ms. Avanthika Raghu – CEO (IT), KG Hospital, for their constant support and encouragement.

We are grateful to the faculty of the physiotherapy from our college for their contributions in organizing and evaluating the papers that are participated in our grand KG Nexus 2022 event. From that moment till publication of these papers, they spent their valuable time and effort in evaluating the papers with various questions regarding the research methodologies.

We express our special thanks to all those students who participated in that event and who came forward to publish the papers in the journal.

Finally we would express our sincere thanks to our students who contributed their knowledge in this journal.

Contents

EFFECT OF TENS WITH PELVIC FLOOR MUSCLES EXERCISE AND AEROBICS VERSUS PELVIC FLOOR MUSCLE EXERCISE AND AEROBICS ALONE ON PRIMARY DYSMENORRHEA IN RELIEVING PAIN -A comparative study

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ABSTRACT

BACKGROUND: Primary dysmenorrhea is a chronic health condition that affects primarily young women.(1) The transcutaneous electrical nerve stimulation (TENS) is a device used to treat pain. TENS has been suggested as an effective pain reduction modality in primary dysmenorrheal (2). The purpose of this study was to compare the effect of the TENS including pelvic floor exercises and aerobics versus pelvic floor exercises and aerobics alone in women with primary dysmenorrhea.

OBJECTIVE: This comparative review aimed to determine the effects of Transcutaneous Electrical Nerve Stimulation (TENS) for Primary Dysmenorrheal.

METHODS:Using experimental design 20 subjects with primary dysmenorrhea were allotted to undergo the treatment of TENS with pelvic floor exercises and aerobics (n = 10) and only pelvic floor exercises and aerobics (n = 10). Pain assessment was done using Visual analog scale before and after 12 treatment sessions that were conducted over non-consecutive days in a 4-week program.

RESULTS: After 12 treatment sessions, on comparing the effect of the TENS including pelvic floor exercises (experimental group A)and aerobics versus pelvic floor exercises and aerobics alone(control group B), interventions given to group A seem to be more effective than the conventional therapy alone.

CONCLUSIONS: Thereby the study concluded by saying that subject treated with TENS including pelvic floor exercise and aerobics were more effective and the pain was reduced.

INTRODUCTION

Primary dysmenorrhea is a chronic condition with symptoms of cramping pain in the lower abdomen occurring just before or during menstruation, in the absence of

other diseases such as endometriosis. It is the more common among adolescent females, which is usually treated by pharmacological agents that are often accompanied by adverse side effects. (1) Transcutaneous Electrical Nerve Stimulation (TENS) has been suggested as an effective pain reduction modality in Primary dysmenorrhea. (2)

METHODOLOGY

Sample size: Totally all these 20 subjects who are all met inclusion criteria were divided into two groups;

Group A: Experimental group –TENS including pelvic floor exercise and aerobics were provided for 10 subjects.

Group B: Control group – consists of 10 subjects and taught to do pelvic floor exercise and aerobics alone.

Study duration: The study duration consists of 9 treatment sessions that were conducted on 1^{st}, 3^{rd} and 5^{th} day of a menstrual cycle on 3 simultaneous cycles.

Inclusion criteria

- Participants with primary dysmenorrhea
- Marital status: single
- Age: between16 to 30 years old
- No history of conception

Exclusion criteria

- Individuals presenting with pelvic diseases
- Subjects installed with the cardiac pacemaker
- History of conception
- Currently using analgesics for pain relief
- Individuals with serious heart, liver, kidney damage or cognitive impairment, aphasia, mental disorders or the inability to cooperate with assessment and treatment.
- Subjects who may be allergic to electrodes

Treatment procedures:

i. TENS

ii. Pelvic floor muscles exercises

iii. Aerobics

Outcome measures

- Visual analog scale (VAS)

RESULTS:

- **The characteristics of the study subjects were as follows in the Table**.

PATIENT AGE	**N**	**MEAN**	**STD.DEVIATION**
TOTAL	20	22.8	4.54
GROUP A	10	23.4	4.73
GROUP B	10	22.2	4.19

- **Paired samples statistics of Group A**

	N	**MEAN**	**STD.DEVIATION**	**t – value**
PRE TEST VAS	10	5.3	1.1	2 .339
POST TEST VAS	10	4.2	1.0	

- **Paired samples statistics of group B**

	N	**MEAN**	**STD.DEVIATION**	**p – value**
PRE TEST VAS	10	5.5	1.0	0.004
POST TEST VAS	10	4.3	0.6	

- **VAS Group Statistics**

VAS	**PRE GROUP A**	**PRE GROUP B**	**POST GROUP A**	**POST GROUP B**
	5.3	5.5	4.2	4.3
P– VALUE	0.5	0.6	0.3	0.4

DISCUSSION

The study was done to find out the effect of TENS with pelvic floor exercise and aerobic and pelvic floor and aerobic exercise in subjects with Primary Dysmenorrhea. In this study 20 subjects were selected randomly according to inclusion and exclusion criteria. The informed consent form was obtained from the subjects individually. Group – A i.e., experiment group (n =10), were treated with

TENS with pelvic floor exercise and aerobic exercise and Group-B i.e., control group (n=10) were treated only with pelvic floor exercise and aerobic exercise. This study consists of 9 treatment session of 12 week program.

CONCLUSION:

It was concluded that subjects treated with TENS with pelvic floor exercise and aerobics were much effective while comparing to the subjects who were treated with only pelvic floor and aerobic exercise in Primary Dysmenorrhoea.

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A COMPARATIVE STUDY BETWEEN JOINT MOBILIZATION AND CONVENTIONAL PHYSIOTHERAPY EXERCISES ON PAIN REDUCTION AND CONTROL OF SEVERITY IN KNEE OSTEOARTHRITIS

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ABSTRACT

BACKGROUND: Osteoarthritis, also known as degenerative joint disease, is the most common type of arthritis. Joint Mobilization, a type of Manual therapy is recently used to relieve pain and increase joint range of motion in O.A knee. Joint mobilization is intended to modify the quality and available range of the target joint and to relieve pain.

OBJECTIVE: At present there are only few studies available which is conducted on comparison between Joint Mobilization and Conventional Physiotherapy in Knee Osteoarthritis. So, the aim is to compare the two therapies to see their results on pain and severity using visual analogue scale (VAS) and Index of severity for osteoarthritis.

METHODS: 14 subjects were chosen, 7 in each group. •Group A - Joint Mobilization: Subjects under this group were treated with Joint Mobilization. •Group B - Conventional Physiotherapy: Subjects under this group were treated with Conventional Physiotherapy. Outcome measures noted using VAS and ISOA before and after 18 treatment sessions that were conducted over non consecutive days in a 6-week program.

RESULTS: After 18 treatment session, joint mobilization and exercises had a significant effect in reduction of ISOA score and pain reduction as well in elderly people with knee OA.

CONCLUSION: It was concluded that joint mobilization improves the effectiveness of the treatment program of exercises in treating symptoms of knee OA and improves function in elderly people with knee OA.

INTRODUCTION

Knee Osteoarthritis is a disease caused by biomechanical stress affecting the articular cartilage and subchondral bone of knee. This disease will cause pain and functional impotence (2). Osteoarthritis is the second most common rheumatologic problem and it is the most frequent joint disease with the prevalence of 22% to 39% in India. (1)

METHODOLOGY

Sample size : A total number of 14 subjects who were selected considering inclusion criteria are divided into two groups as follows: Group A and Group B

Study duration: The duration of the study was totally 18 treatment sessions that were conducted over 3 non consecutive days in a week and it was a 6 - week program.

Criteria

Inclusion criteria:

- All subjects diagnosed with osteo-arthritis
- Gender: male or female
- Age group: between 45 to 65 years were eligible for the study.

Exclusion criteria:

- Subject having age less than 45 years or more than 65 years
- Pain due to neurological, spinal or pelvic origin
- Any other referred pain to hip and knee joint or any other surgery done around knee.
- Intra – articular knee injection within one month of study entry,
- Severe dyspnea at rest,
- The absence of knee pain at the time of recruitment for the study. (3)

Treatment procedure

i. Group A Joint Mobilization

ii. GroupB Conventional Physiotherapy exercises

Outcome measures

- Visual analog scale [VAS]
- Index of severity for osteoarthritis

DATA ANALYSIS:

This chapter includes the statistical analysis of the data collected from 14 knee osteoarthritis subjects and interpretation of the results in the form of tabular representation.

Statistical Tools

The collected data were subjected to statistical analysis using paired and unpaired t – test to find out the research effectiveness.

RESULTS :

The characteristics of the study subjects were as follows in the Table.

PATIENT AGE	**N**	**MEAN**	**STD. DEVIATION**
TOTAL	14	54.2857	6.4633
GROUP A	7	53.2857	5.4435
GROUP B	7	55.8571	6.1278

GROUP A

	N	**MEAN**	**Std. Deviation**	**t-value**
Pre Test ISOA	7	5.2857	0.6998	5.4668
Post Test ISOA	7	3.8571	0.6388	
Pre Test VAS	7	5.7142	1.0303	2.4823
Post Test VAS	7	4.4285	0.9035	

GROUP B

	N	**MEAN**	**STD.DEVIATION**	**t- value**
Pre Test ISOA	7	5.7142	1.0301	1.8709
Post Test ISOA	7	4.8571	0.6388	
Pre Test VAS	7	5.8571	0.8329	3.5112
Post Test VAS	7	4.5714	0.4948	

ISOA	PRE GROUP A	PRE GROUP B	POST GROUP A	POST GROUP B
	5.2857	5.7142	3.8571	4.8571
p– value	0.5117	0.6123	0.4123	0.516

VAS	PRE GROUP A	PRE GROUP B	POST GROUP A	POST GROUP B
	5.7142	5.8571	4.4285	4.5714
p– value	0.7123	0.8134	0.5981	0.6345

DISCUSSION

In this study, both groups A and B obtained successful outcomes, asmeasured by clinical reductions in ISOA scores and VAS. There was statistically significant difference found between the two groups at ISOA score and VAS of the knee.

Results of this study showed the following:

- Joint mobilization and conventional physiotherapy exercises had a significant effect in reduction of ISOA score in subjects with knee OA.
- Joint mobilization and conventional physiotherapy exercises had a significant effect in pain reduction in subjects with knee OA.

CONCLUSION

The aim of this study was to evaluate the effectiveness of Joint mobilization versus Conventional Physiotherapy exercise in knee osteoarthritis . The participants were 14 subjects, divided into two groups (Group -A consists of 7 subjects , Group-B consists of 7 subjects). ISOA score and VAS were evaluated at baseline and at the end of one and half months. The result of this study showed significant improvement in ISOA score and VAS of the knee in both groups. There were statistically significant differences could be demonstrated at ISOA score and VAS between Joint mobilizations alone versus Conventional Physiotherapy exercise group. It was concluded that a manual therapy improves the effectiveness of the treatment program

of exercises in treating symptoms of knee OA and improves function in subjects with knee OA

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EFFECTIVENESS OF PHYSIOTHERAPY IN PATIENTS WITH BENIGN PAROXYSMAL POSITIONAL VERTIGO (BPPV)

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Abstract

***OBJECTIVE*:** The objective of this article is to systematically review the evidence on the effectiveness of physiotherapy in patients with benign paroxysmal positional vertigo (BPPV). The benign paroxysmal positional vertigo results in dizziness and imbalance leading to risk of fall thus, imposing functional limitations. The Epley's repositioning,Semont liberatory maneuvers, habituation techiniques and balance exercises are used as the treatment strategies of the rehabilitation program.

METHODS: 08 subjects whose Dix - Hallpike test was positive, were selected for the treatment. The subjects were treated for 5 days in a week for 2 weeks At the end of 2 weeks rehabilitation program, all the subjects reported complete resolution of BPPV symptoms tested negative for Dix- Hallpike

CONCLUSION: Physiotherapy improves balance control, promoting visual stabilization with head movements, improving vestibular–visual interaction during head movement and expanding static and dynamic posture stability.

Keywords: BPPV, Epley's repositioning maneuver, Semont's liberatory maneuver, Dix- Hallpike

INTRODUCTION

Benign Paraoxysmol Positioning Vertigo and (BPPV) is the most common cause of vertigo. It most often occurs spontaneously in the 50 to 70 years age group. In younger individuals it is the common cause of vertigo following head injury. The cardinal symptom is sudden vertigo induced by a change in head position: turning over in bed, lying down in bed looking up, stooping or any sudden change in head position.There is a relief of symptoms for few minutes and some of it subsides by itself.

The most commonly used test is Dix-Hallpike.The test involves turning the head 45 degrees to one side and then quickly moving from a seated to a supine position with the head declined to 30 degrees below the trunk. The Epley's repositioning,Semont liberatory maneuvers, habituation techniques, Brandt – Daroff Exercises and Cawthorne- Cooksey Exercises are used as the treatment strategies of the rehabilitation program[(1)]. Physiotherapy improves balance by developing vestibular system stimulation and central compensation, promotes visual stabilization and improves posture stability and proved to be effective in resolution of BPPV. The exercises are designed based on the following physiological effects[(2)]

- The oculomotor exercises are designed to improve balance stability and visual–vestibular interaction.
- The repeated head movement exercises are used to promoting visual stabilization and reducing individual sensitivity.
- The balance training exercise emphasizes the use of the vestibular system inputs by altering visual or proprioceptive sensory inputs.
- The functional activities facilitate the vestibulospinal response, help regain balance and improve physical function through exercises that took place during walking in different environments.
- Postural control exercises are designed to prevent falls.

METHODOLOGY:

08 subjects were randomly selectected for this study whose Dix- Hallpike test was positive. The subjects were treated at Outpatient Department of Kasturi College of physiotherapy, Anantapur for 5 days in a week for 2 weeks.

Inclusion Criteria: This study, subjects selected were in the age of 50 and 60 years with clinically evident benign paroxysmal positional vertigo patients.

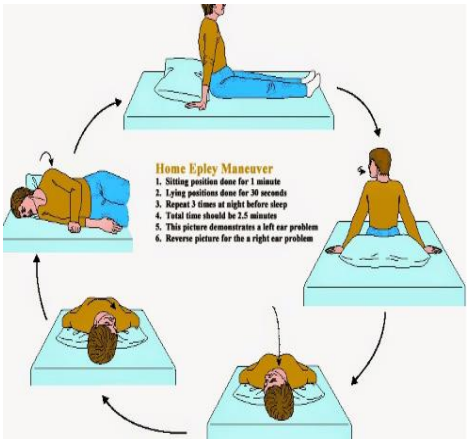
Exclusion Criteria: Non-cooperative patients,mentally unstable patients, patients with cognitive and perceptual problems,Covid-19 patients were excluded from the study. Subjects are informed about the study and their consent is taken for the participation in the study.

Physiotherapy Management In Benign Paraoxysmol Positioning Vertigo (Bppv):-

Two treatment methods have been found effective for relieving symptoms of Benign paraoxysmol positioning vertigo. There are 2 maneuvers in this procedure. They are:-

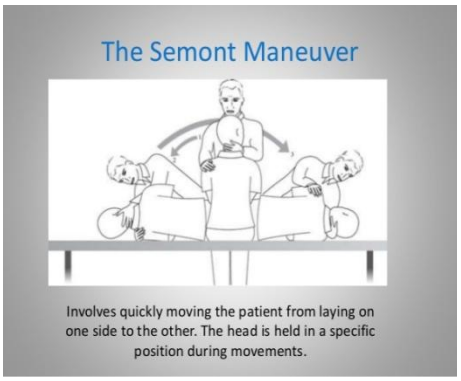
1)Epley maneuver[3] and 2) Semont maneuver[4]

1)EPLEY MANEUVER:- In this procedure, the subject in long sitting position on a



couch, head was rotated to 45° towards the affected side. Then the subject was quickly taken to supine lying position with head out of the couch and maintained in neck extension(below horizontal). While maintaining head extension, the head was rotated to the opposite side by 45°. Then the subject was asked to roll to side- lying position with head maintained in the rotation and extension so that head now faces the floor. Following this position the subject was brought upright in a sitting position. Each position was maintained for 30- 60 s,until the vertigo resolves.

2) SEMONT MANEUVER: In this procedure, the subject in a sitting position over



the edge of the couch, head was rotated to 45° opposite to the affected side. Then the subject quickly goes to side lying on the affected side maintaining head rotation to the unaffected side, so that head faces upwards. From this position a quick transition is done to sitting and then to side- lying to the unaffected side so that now the head faces downwards. Each position is maintained for 30- 60 s until the vertigo resolves.

Habituation Techniques -

- The subjects are advised to avoid quick spins or movements that provoke vertigo.

- The subjects are advised to avoid sleeping on affected side.
- The subjects are advised to try keep head upright during day and avoid all supine activities.

BRANDT – DAROFF EXERCISES[5]:-

- Sit upright on bed.
- Lie down onto side, taking no more than 1-2 seconds to do this.
- Keep head looking up at 45 degrees, remain on side for 30seconds or until dizziness subsides.
- Return to upright position and wait for 30seconds, or until dizziness subsides.
- Lie down onto opposite side, taking no more than1-2 seconds to get into position.
- Keep head looking up at 45degrees angle, remain on side for 30seconds or until dizziness subsides.
- Stay down for another 30seconds or until dizziness subsides.
- Return to upright position and wait for 30seconds or until dizziness subsides.

CAWTHORNE- COOKSEY EXERCISES[6]:-

The aim of the Cawthornecooksey exercises include:-

- Relaxing the neck and shoulder muscles.
- Training the eyes to move independently of the head.
- Practising good balance in everyday situations.
- Practising the head movements that cause dizziness (to help the development of vestibular compensation).
- Improving general coordination.
- Encouraging natural unprompted movement.

RESULTS: In this study, 5 patients showed improvement after Ist week of treatment and the remaining 3 patients showed betterment the consecutive week. At the end of 2 weeks rehabilitation program, all the subjects reported complete resolution of BPPV symptoms tested negative for Dix- Hallpike test.

DISCUSSION: In this study, we assessed the effectiveness of physiotherapy in treatment of BPPV. The results of this study indicate that patients with benign

paroxysmal positional vertigo benefited from physiotherapy. However, further research should be conducted to discover the evidence with appropriately designed clinical trials.

CONCLUSION :

According to this study, Physiotherapy improves balance control, promotes visual stabilization and improves posture stability and proved to be effective in resolution of BPPV and improving the quality of life of the patients.

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EFFECTIVENESS OF MUSICAL EXERCISE THERAPY ON FREEZING OF GAIT IN OLDER ADULTS WITH MILD-MODERATE PARKINSON'S DISEASE.

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Abstract

BACKGROUND: Parkinson's disease is a common neurodegenerative disease in the elderly population. The study aimed to evaluate the effectiveness of a musical exercise therapy on FOG (freezing of gait) in older adults with mild- moderate Parkinson's disease (PD).

METHODS : Its a single –blind study , PD patients ≥ 65 years of age meeting the inclusion subjects were divided into Group A Musical exercise therapy with routine rehabilitation therapies (4 week intervention phase) and Group B Non- musical exercise therapy with routine rehabilitation therapies (4 week intervention phase) outcome measures were measured using (UPDRS) unified Parkinson disease rating scale and (FES) fall of efficacy scale and questionnaires at baseline and week 4th .

RESULTS: Fourteen PD patients from two groups were included in this study .The changes in unified Parkinson disease rating scale (UPDRS) and fall of efficacy scale (FES) were significantly difference between two groups in the 4th week period.

CONCLUSIONS: The musical exercise therapy improves the FOG (freezing of gait, balance, postural stability and confidence in preventing falls in older adults with mild-moderate PD. However, these musical exercise therapies have a significant impact on freezing of gait.

Keywords: Musical exercise therapy, freezing of gait, Parkinson patients

INTRODUCTION:

Parkinson's disease (PD) is the neurodegenerative disease affecting older adults, affects 4-2% of individuals ≥ 65 years age (1). It is associated with a slow short –stepped, shuffling gait pattern, freezing of gait in the mid and late stage of Parkinson's disease which can lead to fall and injuries(2). Musical intervention is used to improve socialization, cognition, emotion and neuro motor function, since it involves various brain regions (3).

AIM AND OBJECTIVE: The aim and objective of the study was to find the effectiveness of a musical exercise therapy on freezing of gait in older adults with mild –moderate Parkinson's disease

METHODOLOGY:

- **STUDY DESIGN** : single –blind study
- **STUDY SETTING** : Department of neurology ,KG Hospital, Coimbatore
- **STUDY SAMPLING**: Convenient sampling method
- **TOTAL SAMPLING SIZE** :(No of sample 28)

  GROUP A: 14 (Musical exercise therapy with routine rehabilitation therapies)

  GROUP B: 14 (Non-musical exercise therapy with routine rehabilitation therapies)
- **STUDY DURATION** :4 Weeks (5 Times a week , with 1 hour each)
- **INCLUSION CRITERIA**

  • Clinically diagnosed with Parkinson's disease Hoehn & 9yahr grade 2&3

  • Age ≥ 65

  • Can stand for at least 30 min ,with or without auxiliary equipment , and can walk independent for 3 meter or more.

  • Response to levodopa / other dopaminergic therapies.

  • Exhibit clear consciousness, can understand the content of the scale and cooperate with examination and treatment .
- **EXCLUSION CRITERIA**

  • Secondary Parkinson's disease

  • History of neurological deficits other than Parkinson's disease

  • Those with deafness, aphasia or sever cognitive impairment with difficulty to communicate normally
- **MEASUREMENT TOOLS:**

  UNIFIED PARKINSON DISEASE RATING SCALE (UPDRS)

  FALL OF EFFICACY SCALE (FES)

PROCEDURE :

According to the inclusion criteria patient were divided into two groups. Total no of patient 28. Group A (14)= Musical exercise therapy with routine rehabilitation therapies ,Group B (14)= Non -Musical exercise therapy with routine rehabilitation therapies

GROUP A: MUSICAL EXERCISE THERAPY GROUP

In addition to routine rehabilitation treatment will provide musical exercise therapy ,Each playlists will be loaded into a personal music player and subjects are allowed to choose headphones for maximum comfort While listening to music patient will be subjected to conduct flat start walking, turning around , and stop (at the end)training as well as narrow space walking and stair step training according to the beat in the music , the patient will be expected to simultaneously complete a cycle of exercise relative to completion of the music play list

Routine rehabilitation therapies

Routine drug treatment, Posture correction training, Balance training, Walking training, Daily life ability training

GROUP B: NON-MUSICAL EXERCISE THERAPY WITH ROUTINE REHABILITION THERAPIES

Patients will be allowed to wear earphones without music , then subjected to flat start walking ,turn around , and stop (at the end) training as well as narrow space walking and stair step training .

Routine rehabilitation therapies

Routine drug treatment, Posture correction training, Balance training, Walking training, Daily life ability training

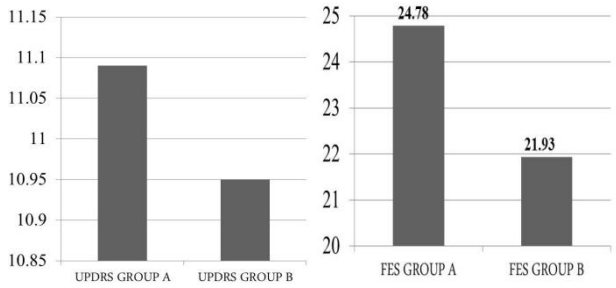
DATA ANALYSIS: Paired & unpaired ‘t’test

RESULTS:

The changes in unified Parkinson disease rating scale(UPDRS) and fall of efficacy scale(FES) were significantly difference between two groups in the 4th week period**.** The mean value of the p -test score of UPDRS in group A 11.09, tabulated value of t at 5%level of significant for (n-1) i.e 13, and d.f is 2.16. 11.09 > 2.16, so null hypothesis is rejected. The mean value of the p- test score of UPDRS in group B 10.95 ,tabulated value of t at 5%level of significant for (n-1) i.e 13 ,d.f is 2.16 .10.95> 2.16 so null hypothesis is rejected . The mean value of the p-test score of FES in group A 24.78, tabulated value of t at 5%level of significant for (n-1) i.e 13, d.f is 2.16. 24.78 > 2.16, so null hypothesis is rejected. The mean value of the p-test score of FES in group B 21.93, tabulated value of t at 5%level of significant for (n-1) i.e 13, d.f is 2.16. 21.93 > 2.16, so null hypothesis is rejected.

Graphical representation of data

POST TEST COMPARISON BETWEEN GROUP A & GROUP B



DISCUSSION :

The musical therapy causes behavioural changes in patient due to modeling of brain nerves rhythm is an inherent characteristic of music that can associate with various behavior such as movement , phonation , respiration and the heart rate to cause synchronous stimulation of nerve in the brain .(4) Rhythmic auditory training improves the gait velocity , cadence and stride length in Parkinson patients.(5) Music can produce substantial effects on movement related symptoms and psychological problems in Parkinson disease treatment. Rhythm has a crucial role in rehabilitation , enhancing connection between the motor and auditory system. (6) Musical therapy aims at enhancing sensory ,cognitive and motor function in Parkinson's disease treatment .(7) Freezing of gait is the most common gait abnormality that occurs during mid and late stage of Parkinson's disease which can led to fall and injuries , the musical exercise therapy reduces the risk of fall and freezing in Parkinson's patients and improves their quality of life. (8)

CONCLUSION :

The musical exercise therapy have a significant impact on freezing of gait .The musical exercise therapy group shows improvement in balance , postural stability and confidence in preventing fall in older adults with mid-moderate Parkinson disease.

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EFFECT OF BUTEYKO BREATHING ON ENDURANCE AND PULMONARY FUNCTION AMONG YOUNG ATHLETES. -A QUASIEXPERIMENTAL STUDY

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ABSTRACT

BACKGROUND*: Endurance* is the ability to continue a prescribed task in the desired manner. It is the time that a subject can sustain an activity at a certain percentage of maximal force, or the number of seconds a force can be maintained at a certain percentage of maximal force. The pulmonary function and endurance are very essential to the athletes for their performance. Buteyko breathing retrains breathing pattern through repetitive breathing exercises to correct hyperventilation. Diaphragmatic breathing facilitates the primary inspiratory muscle,diaphragm and reduces the usage of accessory muscles.This study is done to determine the effect of Buteyko breathing on Endurance and Pulmonary function among Young Athletes.

METHODOLOGY**:** A sample of 14 normal young male athletes were selected and randomised into 2 groups .Group A with 7 subjects received Buteyko breathing exercise and Group B with 7 subjects received Diaphragmatic breathing exercise for a period of 4 weeks.Pulmonary function was measured using Peak expiratory flow metre.and Endurance was measured using 20 metre Shuttle Run test.

RESULT: Statistical Analysis was made usind paired „t" test and independant „t" test at 5% level of significance.Pre-test values showed that there is no significant difference between the Groups.After intervention,the Group A who received Buteyko breathing exercise showed a greater level of significant difference in Endurance and Pulmonary function than Group B who received Diaphragmatic breathing.

CONCLUSION*:* From this study it is concluded that the Buteyko breathing exercise is moe effective in improving Endurance and Pulmonary function among Young athletes.

Keywords: *Athletes,Buteyko* breathing, Diaphagmatic breathing, Endurance, Pulmonary function, Peak expiratory flow rate, 20 metre Shuttle Run Test.

INTRODUCTION

Cardio respiratory Endurance is one aspect which is needed in sports. Endurance is an ability to do physical activities for a long duration without experiencing excessive fatigue.[2] Breathing Exercise can be defined as the therapeutic intervention by which purposeful alteration of a breathing pattern which has outcomes such as increasing lung volume ,clear secretions, improve gas exchange ,control breathlessness, increase exercise capacity, reduce blood pressure, to reduce anxiety and relaxation for stress reduction.[5]Regular forceful inspiration and expiration for prolonge dperiods during playing leads to the strengthening of the respiratory muscles both voluntary and involuntary.This helps the lungs to inflate and deflate maximally.[4]Breathing control, involving deep breathing is another relaxation technique that is used to help athletes deal with anxiety.[7]

DIAPHRAGMATIC BREATHING EXERCISE:

Diaphragmatic breathing involves in the slow and deep breathing from the diaphragm which promotes a subjective stae of relaxation as well as physiological effects that are contrary to hyperventilation and autonomic nervous system arousal.[14]

BUTEYKO BREATHING TECHNIQUE:

Buteyko breathing aims to reduce hyperventilation.It corrects the patient‟s breathing pattern by reducing hyperventilation and thereby resetting CO2 levels.[12] Buteyko breathing technique is mechanically focused on decreased respiratory rate and increased CO2 levels so that the optimal oxygenation process occurs.[1]

METHEDOLOGY

- **STUDY DESIGN**:A Quasi Experimental study
- **SAMPLING TECHNIQUE**: Purposive Sampling Technique
- **STUDY SETTING**: Dr.NGP Arts and Science College Campus Playground, Coimbatore.
- **STUDY POPULATION**: Male Athletes.
- **STUDY DURATION**: 7 days for 4 weeks.
- SAMPLE SIZE:14 athletes; 7 in each group
- GROUP A = 7 participants(Experimental group) GROUP B = 7 participants(Control group)

MEASUREMENT TOOLS

- 20 metre Shuttle Run Test

- Mini Peak Expiratory Flow Metre

OUTCOME MEASURES

- Endurance
- Peak Expiratory Flow Rate

SELECTION CRITERIEA

INCLUSION CRITERIA

- Age 18-25 years.
- Male Athletes
- Athletes of regular training for past 6 months

EXCLUSION CRITERIA

- History of any sports injuries in last 6 months.
- History of any surgeries and fractures.
- History of any respiratory condition
- History of asthma

 EXERCISE PROGRAM

BUTEYKO BREATHING TECHNIQUE

Nose Breathing

Nodding : 10 repetitions

Ask the subject to Nod his head backwards and forwards .Then ask him to co ordinate the nodding movement with his breathing. Tell him to breathe in as his head goes back and breathe out as it comes forward

Tipping : 6 repetitions

Instruct the subject to do a normal breathe in and breathe out gently and then hold his nose. Ask him to tip his head backwards 3 to 6 times while holding his breath (nodding should be faster than earlier). Then ask him to release his nose and breathe in gently by keeping the mouth closed.

Hold and Blow: 6 repetitions

Ask the subject to breathe in and out gently and hold his nose. Increase the pressure at the back of his nose by trying to blow out.He may feel ears „pop up‟. Keep the gentle pressure going for a count of 5 and then breathe in through his nose

Relaxed breathing

Instruct the subject to sit erect and one hand placed over the upper chest and one over the abdomen. Then ask him tot ake a deep breathe through the nose and breathe out gently through his mouth. While breathing taking place, the hand above

the abdomen should move while the hand over the upper chest remains static. Relaxed breathing is done for 3 minutes.

Control pause

Ask the subject to take in a normal sized breath in and out through his nose and hold his nose gently and start the stop watch. Now, ask him to hold his breath until he feel the first onset of a feeling of lack of air. Then ask him to release his nose, breathe in gently through his nose and stop the stop watch.

DIAPHRAGMATIC BREATHING EXERCISE

Ask the subject to sit comfortably with knees bent and shoulders,head and neck relaxed. Tell the subjest to place one hand over his upper chest and the other just below the rib cage. This will allow him to feel his diaphragm move as he breathe. Ask the subject to breathe in slowly through the nose so that the stomach moves out against his hand. The hand on the chest should remain as still as possible. Finally ask the subject to tighten his abdomen, letting them fall inward as he exhale through pursed lips.The hand on the chest should remain as still as possible.

STATISTICAL ANALYSIS

The collected data were tabulated and analyzed using descriptive and inferential statistics. The following statistical tools were employed to analyze the data and testing of hypothesis. Data analysis was done using Statistical Package for Social Science (SPSS) Software version.

DATA ANALYSIS AND RESULTS

PEAK EXPIRATORY FLOW RATE PRE- TEST VALUE

When the pre test values of Group A and Group B are analysed by independant „t‟ test,the calculated value was 1.020.For 12 degree of freedom at 5% significance, the table „t‟ value is 2.179. It is proved that there is no significant difference between Group A and Group B.

GROUP A: For 6 degree of freedom at 5% level of significance,the table „t‟ value is 2.447.The calculated value between pre -test and post-test was 4.542. Since the calculated value is greater than „t‟ value, null hypothesis H01 is rejected.

GROUP B: For 6 degree of freedom at 5% level of significance, the table „t‟ value is 2.447.The calculated value between pre-test and post-test was 3.575.Since the calculated value, null hypothesis H02 is rejected.

POST-TEST VALUE: When the post-test values of Group A and Group B are analysed by independent „t‟ test,the calculated value was 2.549. For 12 degree of

freedom at 5% level of significance,the table „t‟ value is 2.179. It is proved that there is significant difference between Group A and Group B and null hypothesis H03 is rejected.

20 METRE SHUTTLE RUN TEST PRE-TEST VALUE

When the pre-test values of Group A and Group B are analysed by independent‘t’, the calculated value was 0.336.For 12 degree of freedom at 5% level of significance , the table „t‟ value is 2.179. It is proved that there is no significant difference between Group A and Group B. GROUP A: For 6 degree of freedom at 5% level of significance, the table „t‟ value is 2.447 .The calculated value between pre-test and post-test was 12.000. Since the calculated value is greater than „t‟ value, null hypothesis H01 is rejected.

GROUP B:For 6 degree of freedom at 5% level of significance , the table „t‟ value is 2.447.The calculated value between pre-test and post-test was 7.481.Since the calculated value is greater than „t‟ value, null hypothesis H02 is rejected.

POST-TEST VALUE: When the post test values of Group A and Group B are analysed by independent „t‟ test, the calculated value was 2.800.For 12 degree of freedom at 5% level of significance, the table ‘t’ value is 2.179 .It is proved that there is significant difference between Group A and Group B and null hypothesis H03 is rejected.

DISCUSSION

Buteyko breathing technique is aimed to reduce pulmonary ventilation which will increse the carbon dioxide levels in human body. The increase of carbon dioxide levels is leading to an increase in the oxygen partial pressure that forces the oxygen to be released from the haemoglobin (Bohr Effect). It will increase the oxygen delivery into the tissues and cells . Intensive physical activity offers some additional positive conditions such as higher heart rates, perspiration and muscular work. These conditions facilitate the adaption of human body to higher carbon dioxide levels. As a result of repetitive breath holds with reduced breathing,the carbon dioxide levels remain high all the time .In this study the effect of Buteyko brathing on endurance and pulmonary function among young athletes was compared with another group of athletes who recieved Diaphragmatic breathing exercise. Peak expiratory flow rate and 20 metre shuttle run test was evaluated and was calculated before and after the intervention the result showed that both groups had improvement in the Peak expiratory flow rate and increase in distance in metres in 20 metre shuttle run test but

the Buteyko breathing technique had more effect on endurance and pulmonary function among youmg athletes.

CONCLUSION

The result showed significant improvement in both Group A nad Group B. The data was collected and analysed used paired „t" test and independent „t" test. On comparison Group A showed greater improvement than Group B. According to this study,it is concluded that the Buteyko breathing is more effective on improving endurance and pulmonary function among young athletes.

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EFFECTS OF KINESIOTAPING IN PREMENSTRUAL SYNDROME

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ABSTRACT

BACKGROUND: Pre Menstrual syndrome is a combination of physical and emotional symptoms that many women get after ovulation and before the start of their menstrual period. Premenstrual syndrome consists of clinically significant somatic and Psychological manifestations during the luteal phase and disappears after the onset of menstruation. Major symptoms include low back ache, abdominal pain, constipation, headache, breast tenderness etc. This study aims in evaluating the effects of kinesiotaping on premenstrual syndrome. The analysis provides a basic data for physiotherapy intervention for Premenstrual syndrome.

METHOD: 50 females in their early 20s with Premenstrual syndrome were randomly selected according to the selection criteria and assigned in taping and non-taping group. Kinesio tape of optimal length was applied over the anterior abdominal wall. Pre-menstrual syndrome symptoms were assessed using a questionnaire before and after the intervention.

RESULT: among 23 taping and non-taping group menstrual pains significantly decreased which was assessed using visual analog scale post taping. But in the case of other accompany Pre-menstrual syndrome like breast tenderness, anxiety, headache, decreased activity etc., it does not show any drastic change.

***CONCLUSION*:** Kinesio taping is a feasible and non-analgesic intervention for females with Pre Menstrual syndrome.

KEY WORDS: Kinesiotaping, Pre-menstrual Syndrome, Menstrual pain, menstrual distress questionnaire

INTRODUCTION:

Many women in their reproductive ages have one or more emotional or physical symptom in the pre-menstrual phase of menstrual cycle. The symptoms are mild, moderate to severe and are associated with substantial distress or functional impairment. In early medical report about this issue, clinically significant pre-menstrual symptoms were named as Pre Menstrual Tension.[1] In the mid 1980`s multi-disciplinary US national institutes of health consensus conference on Pre-menstrual syndrome proposed criteria that were adopted by diagnostic and statically manual (DSM) to define the severe form of this condition.[2] The diagnosis of this disorder stipulates (1) the presence of at least five luteal phase symptoms (panel), at least one of which must be a mood symptom (i.e.) depressed mood, anxiety or tension, irritability, and persistent anger (2)evidence of functional impairment.

Finally, the symptoms must not be the exacerbation of another psychiatric condition.[3] A problem with PMS diagnosis is that many women with clinically significant pre-menstrual symptoms do not meet full diagnostic criteria. The American College of obstetrics and gynaecology has attempted to rectify this situation by defining moderate to severe PMS. The criteria is that, presence of at least one psychological or physical symptoms that causes significant impairment.[4] Most studies on the prevalence of pre-menstrual complaints are based on retrospective report.[5]

However, the findings of these studies are consistent with those from the few epidemiological studies that used prospective symptom ratings.[6, 7] Findings of prospective and retrospective studies suggest that 5 to 8% of women with hormonal cycles have moderate to severe symptoms. However, some studies suggest that up to 20% of all women in reproductive age have premenstrual complaints that could be regarded are clinically relevant.[8] Symptoms often worsen substantially 6 days before, and peak at about 2 days before the menses start.[9]

The tape creates a micro space between the skin and tissue and thus increases the local circulation. The application of kinesio tape results in improvement of muscle contractibility by supporting weakened muscles. Kinesiotape facilitates an immediate increase in muscle strength by generation a concentric pull on the fascia[10].

METHODOLOGY:

The subjects of the study were 30 unmarried, non-parous women in their early twenties without pathologic existence in their pelvic cavity whose menstrual pain scores were higher on VAS. The subjects were assigned into taping (n=23) and non-taping group (n=23).4 subjects were excluded, because their menstrual due date does not correspond to the time of study. The subject's menstrual cycle was first checked and then degrees of menstrual pain and Pre Menstrual syndrome were assessed before application of taping. Subjects with regular menstrual cycle underwent taping, total of six times twice in a week for about three weeks starting from 14 days before menstruation until it ends.

A piece of kinesiotape, 5cms in width and 7-8cms in length was applied right from below the umbilical region and reached to where the pubic hair began over anterior abdominal wall. Another piece of tape 10cms in length was applied to make a cross shape with the first piece. Degrees of menstrual pain were assessed using Visual analog scale on a 10cms linear scale. In this study, a score of 0 represents a very low degree pain and 10 meant very high degree pain. After application the measure of Pre-menstrual syndrome such as decreased activities, low back pain, tension, anxiety, breast tenderness and headaches were assessed using menstrual distress questionnaire.

RESULT:

Among 13 taping and non-taping group menstrual pain significantly decreased which was assessed using visual analog scale post taping. But in the case of other accompany PMS like breast tenderness, anxiety, headache, decreased activity etc., it does not show any drastic change.

DISCUSSION:

Between twenties, 90% of female experience menstrual pain and 15% experience severe pain, which can be serious disrupt to their daily activities. Kinesiotaping is an auxiliary treatment that maximizes natural recovery ability and corrects the imbalance of human body. The limitation of the study was the subjects of early 20`s. Thus it was difficult to generalize the findings with the subjects of all other age group. There were extensive data on kinesio taping on musculoskeletal disorders, but there were only limited data on pre-menstrual syndrome which subverts the

reliability of this study. Consequently, future studies should examine broader subjects which would ultimately strengthen the reliability of the data.

CONCLUSION:

Thus kinesiotaping is feasible, non-analgesic intervention for females with Premenstrual syndrome.

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RELATIONSHIP BETWEEN LUMBAR ANGLE AND LOW BACK PAIN IN SUBJECT WITH LOW BACK PAIN

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ABSTRACT

BACKGROUND: Lower back pain is one of the most common health problem among all population of the world ,lower back pain is experienced in 60-80 % of adults at some point in their life time. The annual worldwide low back pain incidence in adults to be 15% and the point prevalence to be 30%. Low back pain has been connected to postural and structural asymmetries, most common in pelvic region .men and women are equally reported to be affected by this condition. 50 % of adult 30% of adolescents are said to be affected

METHODS: 80 Subject who filled the inclusion criteria were selected by convenient sampling method and the duration of study 3 months.

RESULTS: The value of r is 0.7355.this is moderate positive correlation which means there is a relationship between x (NPRS Score) & y (lumbar angle values).

CONCLUSION: This study concludes that there is significant relationship between lumbar and lower back pain in subjects with low back pain.

Keywords: lower back pain, lumbar angle, lumbar lordosis, flexi ruler.

INTRODUCTION

Lower Back Pain Is One Of The Most Common Health Problems Among All Population Of The World. Lower Back Pain Is Experienced In 60-80 % Of Adults At Some Point In Their Lifetime. The Annual Worldwide Low Back Pain Incidence In Adults To Be 15% And The Point Prevalence To Be 30%.Researches Stated That At

Least 50% Of Adult Would Have Experienced A Low Back Pain Episode . Men And Women Are Equally Reported To Be Affected By This Condition.50% Of Adult 30% Of Adolescents Are Said To Be Affected. Low Back Pain Has Been Connected To Postural And Structural Asymmetries ,Most Common In Pelvic Region. Pelvic Asymmetric Refers To Asymmetric Pelvic Alignment With Respect To The Vertical Axis ,In The Frontal Or Sagittal Planes .Pelvic Asymmetery In The Sagittal Plane , Namely Iliac Rotation Asymmetry , Is Often Linked To Sacroiliac Joint Dysfunction And Referes To Malalignment Between The Left And Right Innominate Bones.This Malalignment Could Either Be Unilateral Anterior Or Posterior Roatation Of Innominate Bones.In Frontal Plane Failure Of The Pelvic To Lie In A Perfectly Horizontal Position Is Commonly Called Lateral Pelvic Tilt .It Is Presumed That Pelvic Pelvic Asymmetry Alters The Body Mechanics And Puts Various Body Segments Under The Strain And Therefore ,Contributes To Musculoskeletal Pain In The Lower Back Region. Altered Trunk Kinematics In Sitting Might Potentially Affects The Performance Of Functional Task In Common Position.

Biomechanically The Movements Of The Lumbar Spine Consists Of Cumulative Motions Of Vertebrae With 80-90% Of The Lumbar Flexion And Extension Occurring At The L4-L5 And L5-S1 Intervertebral Disk. Low Back Pain May Occur As A Results Of Excessive Physical Stress On Normal Spinal Structure Or Of Normal Physical Stress On Abnormal Spinal Structure .There Was A Deviation In The Posture ,Asymmetries And Abnormal Mechanics Were The Predisposing Factor For The Low Back Pain .Curvature In The Spine Is Designed To Balance The Body ,To Improve Flexibility And To Absorb Stress And Equal Distribution Of The Load And Weight .Normally There Is A Lordotic Curve Present In The Lumbar Spine .

Alteration In The Lumbar Spine May Results In Pathological Causes. Although There Was No Accurate Angle Measured In The Lumbar Curvature Still Flexibile Ruler Founds That 30°-40° As The Normal Range.If Any Angle More Than 40° Is Considered To Be Hyperlordosis . Normal Lumbar Lordosis Has To Be Maintained By The Human Is Alteration In The Lumbar Curvature In Standing Or Sitting Cause By Alteration In The Muscle Due To Poor Postural Habits Or Trauma. Excessive Lordosis Has Been Advocated As The Cause Of Postural Back Pain. Lordotic Posture Would Be Associated With Anterior Tilt Of The Pelvis And Hip

Joint Flexion ,Resulting In An Increase In Standing Lumbar Lordosis And Pelvic Inclination. Increase In Lordotic Posture Results In Low Back Pain. Muscles Play A Major Role In Increase Of The Lumbar Lordosis, Multifidus , Transerve Abdominis And Internal Muscle In The Trunk Act Late In Patients Suffered From Hyperlodosis .

There Is A Strong Correlation Between The Weakness Of Trunk Muscles And An Increased Lordotic Angle. Weakness In Any Of The Muscles Of The Limbo Pelvic Area Results In Impaired Muscular Activation And Poor Balance. Flexible Ruler Was First Described Almost 50 Years Ago. Now This Device Is One Of The Widely Used Device To Measure The Degree Of Spinal Curvature In The Saggital Plane.This Instrument Is Described As 40, 50 Or 60 Cm Strip Of Lead Coverd With The Plastic Which Can Be Bent In One Plane Only And Retains In The Shape Into Which It Is Positioned .The Flexible Ruler Is Molded According To The Contour Of The Spine Of T12, L1, L5 And S2 Spinous Process And Pressed Tightly To The Body So As To Avoid Any Hollow Space Between The Ruler And Skin .

The Ruler Is Moved And The Internal Edge Are Tracked In The Paper And Thus The Lumbar Curvature Marked. Pain Was Measured By Numerical Pain Rating Scale. NPRS Have Shown High Correlation With Other Pain Assessment Tools In Several Studies.

METHODS: 80 Subject Who Filled The Inclusion Criteria Were Selected By Convenient Sampling Method And The Duration Of Study 3 Months.

Inclusion Criteria : Age Group Of 20 – 40 Years ,Both Gender , Pain Measured ≥ 6 On NPRS ,Low Back Pain For More Than 2 Months , LBA Diagnosed By Orthopaedician , BMI 18- 24.

Exclusion Criteria : Any Spinal Deformities , Presence Of Radiating Pain , Past History Of Spinal Compression Fracture , Patient Unable To Palpate Spinous Process, Current Pregnancy , Uncooperative Participants.

Procedure : For The Evaluation Of Lumbar Angle With Flexi Ruler , The Subjects Stood Barefoot With Back Uncovered And The Spinous Process Of T12, L1 To L5,S1 Vertebrae Palpated ,Identified And Marked With A Marker .The Subject Were Instructed To Remain Standing With The Knee Straight And Feet Parallel . To Measure The Degree Of Lordosis ,The Flexible Ruler Was Placed Over Spinous

Processes Of The Lumbar Spine And Shaped To Fit The Contours Of The Spinal Curves. The Instrument Was Carefully Removed And Traced Onto A Piece Of Plain White Paper . A Vertical Line Was Drawn To Connect The L1 And S2 Landmarks (L Line).First The Maximum Width (H Line) And Then The Middle Of Lumbar Curvature Length Was Measured In Centimeter . Then By Using The Equation Of (Theta) = 4 Arctang 2(H/1) The Degree Of Lumbar Lordosis Is Calculated .

RESULTS : The Value Of R is 0.7355. This Is A Moderate Positive Correlation , Which Means There Is A Relationship Between X (NPRS Score) And Y (Lumbar Angle Values). The P Value is <.0.0001. The Result Is Significant At P < .05

CONCLUSION : This Study Concludes That There Is Significant Relationship Between Lumbar And Lower Back Pain In Subjects With Low Back Pain.

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EFFECTIVENESS OF MULLIGAN'S TRACTION STRAIGHT LEG RAISE AND BENT LEG RAISE IN LOW BACK ACHE WITH RADICULOPATHY

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ABSTRACT

BACKGROUND: Objective of the study was to compare the Effectiveness of Mulligan's Traction straight leg raise and Bent leg raise in low back ache with radiculopathy.

METHODS: 20 patients with Acute Mechanical Low back Ache with Radiculopathy, with limitation of straight leg angle between 30 to 70, were randomly assigned into two groups of 10 each and treated there pain with mulligan's traction straight leg raise and bent leg raise technique for 6 consecutive days. Pain intensity and discomfort, was evaluate before and after treatment programme by Quebec back pain disability scale was considered for assessment and analysis.

RESULTS: Our study revealed that Mulligan's Bent leg raise technique is more effective in management of low back pain with Radiculopathy.

CONCLUSION: Our results indicate that there is significant reduction in pain and disability by mulligan's traction straight leg raise and bent leg raise technique. After 6 days of treatment there is significant effect in reduction of Acute low back pain.

Key words: Mulligan's traction leg raise, Bent leg raise technique, Pain intensity, Disability, Quebec back disability scale.

INTRODUCTION

Low back pain is the leading cause of worldwide disability and it occurs in similar proportions in all cultures, interferes with quality of life and work

performance, and is the most common reason for medical consultations.[1] Low back pain is a common musculoskeletal disorder causing back pain in the lumbar region. The term low back pain refers to pain in lumbosacral area of the spine encompassing the distance from the 1st lumbar vertebra. This is the area of the spine where the lordotic curve forms the most frequent site of low back pain is in the 4th and 5th lumbar region.[4]

Risk factors for the development of back pain include heavy physical work, frequent bending, twisting, lifting, poor physical fitness and prolonged standing posture, psychosocial risk factors include anxiety, depression, and mental stress at work.[2] Sciatica is a symptom, pain radiating downward from the buttock over the posterior or lateral side of the lower limb. It is usually assumed to be caused by compression of nerve. In degenerative disc joint diseases the narrowing of the disc space and osteophytes may encroach the spinal nerve root resulting in sciatica. Up to 40% of people experience sciatic pain.

Prevalence of sciatic pain didn't differ between males and females.[3] It was 5.1% for males and 3.7% for females, and affecting age group between 45 to 65 years. In India incidence of low back pain has been reported to be 23.09 % and has a lifetime prevalence of 60 – 85%. Peoples are tending to get back pain early due to involving heavy work in abnormal posture[7]. Mostly they are working in long time standing posture and also working in flexed posture, bending, lifting, carrying, twisting etc[8]. A combination of lifting, bending, and twisting appears to be most hazardous and easy to get back pain early.

METHODOLOGY:

The sample size for this research study was twenty (20). It was calculated on the basis of past physiotherapy records. The study sample included male and female individuals with low back ache with radiculopathy. The sampling design was a random sampling method. A simple random method was used for assigning patients in to two groups (Envelope method). Both male and female participants with clinical diagnosis and radiological evidence of Lumbar spondylosis with radiation or low back pain (LBP) with radiculopathy, with limitation of Straight Leg Raise angle and who were referred to physiotherapy department and willing to take treatment for 6

consecutive sessions were recruited for the study. The method of data collection employed for the present study was a primary method. Data was collected from physiotherapy OPD of Mannai Narayanasamy College Of Physiothrapy, Mathur, Thanjavur.

INCLUSION CRITERIA: Age: 22-73 years**,** Gender: male/female**,** Unilateral/bilateral radiation of pain in the sciatic nerve distribution**,** Limitation of straight leg raise angle between 30 to 70 due to pain.

EXCLUSION CRITERIA History of spine surgery in previous 6 months, Knee and ankle pathology causing limitation of movement**,** Clinical conditions such as pregnancy, oversensitive skin, patients with cardiac pacemaker**,** Psychological low back pain**,** Spondyloarthropathies**,** Altered deep tendon reflexes**,** Motor weakness,Mental disorders**,** Tumours/malignancies**,** Any other major illness. The patients were chosen according to the inclusion and exclusion criteria and were randomly assigned study. They are divided into two groups.

GroupA - Mulligan's traction straight leg raise and TENS - Mulligan's Traction Straight Leg Raise technique to the affected limb immediately following Transcutaneous Electrical Nerve Stimulation (TENS) for 15 minutes. Three repetitions of Mulligan's Traction Straight Leg Raise were done with 5 seconds hold and 5 seconds relax time. The pain free Straight Leg Raise traction was given for 3 repetitions.[9]

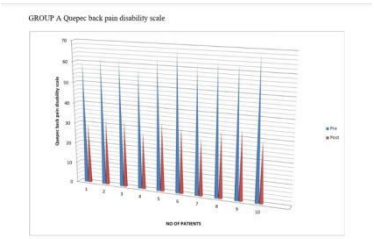
GroupB – Mulligan's bent leg raise and TENS - Mulligan's Bent Leg Raise technique to the affected limb immediately following Transcutaneous Electrical Nerve Stimulation (TENS) for 15 minutes. Three repetitions of Mulligan's Bent Leg Raise were done with 5 seconds hold and 5 seconds relax time. The pre treatment scores of functional well being using quebec back pain disability scale. After a single set of treatment, patient was allowed to take a walk for 2 minutes in or outside the room to feel relaxed and comfortable. Same treatment was given to the patients for 6 days.[6] The post treatment scores of pain and functional well being were recorded and compared with pre treatment score.

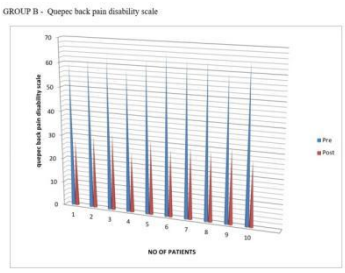
Comparison of pre test and post test values of Quebec functional disability scale [5]in Group-A

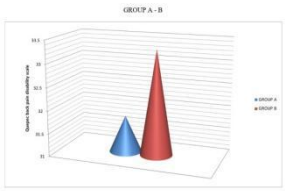
Group	Measurement	Mean	Mean difference	Standard deviation	Paired "t" test	Table "t" value at 0.005
A	Pre test Post test	63.1 31.3	31.8	29.87	3.36	3.250

Comparison of pre test and post test values of **Quebec functional disability scale** in **Group B**

Group	Measurement	Mean	Mean difference	Standard deviation	Paired "t" test	Table "t" value at 0.005
B	Pre test Post test	62.4 29.1	33.3	24.7	4.26	3.250







RESULT AND DISCUSSION

Group A-The result showed that for Mulligan's traction straight leg raise technique to Group A (Quebec functional disability scale) "t" calculated value (3.36) is significantly greater than "t" table value of 3.250 (> 0.005) **Hence alternative hypothesis was accepted** When comparing both group values by a paired (Que pec functional disability scale) "t" test the calculated "t" value (0.122) and "t" table value is 1.33 (0.10) **Group B -**The result showed that for Mulligan's bent leg raise technique to Group B (Que pec functional disability scale) "t" calculated value (4.26) is significantly greater than "t" table value of 3.250 (> 0.005**)** Hence alternative

hypothesis was accepted Hence unpaired “t” test shows comparative effects of Group A and Group B. The results shows that there is no significant difference in functional disability between group A and group B. The “t” table value of group A is 3.36 and Group B is 4.26, Hence there is a significant improvement in Group B than Group A.

CONCLUSION

Effectiveness of the study was assessed by Quebec back pain disability scale to Analysis of the data showed that there was significant improvement in both Mulligan’s traction straight leg raise and Bent leg raise. Here we conclude that “Mulligan’s bent leg raise is more effective then traction straight leg raise for reducing pain and improving functional well being.

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EFFECT OF PLYOMETRIC TRAINING VERSUS CIRCUIT TRAINING ON SPEED, AGILITY AND EXPLOSIVE POWER IN COLLEGIATE KABADDI PLAYERS

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ABSTRACT

Improving physical fitness is very much important as far as the performance of the athlete is concerned and also an important determinant of success. Kabaddi, a traditional outdoor game needs greater amount of physical fitness components like speed, agility and explosive power to attempt a successful ride or tackle. The aim of the study was to determine the effect of Plyometric training versus Circuit training on speed, agility and explosive power in collegiate Kabaddi players. 30 collegiate Kabaddi players were selected and divided into 2 groups of 15 Kabaddi players in each group based on the convenient sampling method. Players in Group A underwent Plyometric training and the players in Group B underwent Circuit training for 4 weeks. 60 meter sprint teat, Agility T – test and Sargent jump test were used to measure Speed, Agility and Explosive power. There was a significant difference between the within group and between group in all parameters following intervention. However Plyometric training group have shown significant improvement in all parameters following intervention (using unpaired 't' test, the calculated 't' value for Speed is 6.17, $p<0.05$, the 't' value for Agility is 7.13 and the 't' value for Explosive power is 4.66, $p<0.05$). This study concludes that the Plyometric training is more effective in improving the speed, agility and explosive power than the circuit training among the collegiate Kabaddi players.

KEYWORDS: Kabaddi; Plyometric training; Circuit training; Speed; Agility; Explosive power.

INTRODUCTION:

Kabaddi is a traditional outdoor game played with minor variations in all regions of India; which requires both power and skills for its play. It needs high physical strength, agility, individual skill, neuromuscular co-ordination, high aerobic

endurance, rapid and smart reaction. Kabaddi includes attacking and defensive skills. Both attacking and defensive skill needs large amount of physical fitness. In attacking skill, use of hand, leg thrust and kick are more commonly performed. The defensive skills include a series of various holds like ankle hold, knee hold, thigh hold, waist hold and wrist hold. Physical fitness becomes the very important part as far as sports performance and achievement is concerned.

Training is primarily a systematic athletic activity of long duration, which is progressively and individually graded. Training adaptation is sum of transformations brought about by systematically repeating exercise (1). In some sports speed is one of the most important and necessary bio-motor elements. Every sports activity such as games needs speed because in general, speed is a potential that allows a player to move as quickly as possible at the level of specific resistance (2).

Agility is the ability to change direction rapidly and accurately. The term "quickness" used interchangeably for both agility and change of direction and speed. Quickness has been identified as "a multi-planar or multidirectional skill that combines acceleration, explosiveness and reactive" this definition suggests that quickness consists of cognitive and physical reactive abilities and explosive acceleration (3).Explosive leg power is a critical component for successful performance in many athletic events. Vertical jumping constitutes an integral component of explosive performance in numerous athletic activities. As such, jumping ability is crucial in the execution of many athletic skills. Jumping is a complex multi-joint action that demands force production and also a high power output (4,5).

Plyometric training is a technique used by athletes in all types of sports to increase strength and explosiveness. It consists of a rapid stretching of a muscle (eccentric action) immediately followed by a concentric or shortening action of the same muscle and connective tissue (6). The stored elastic energy within the muscle is used to produce more force that can be provided by a concentric action alone (7). Circuit training is a type of training that utilizes a number of stations that emphasize different muscle groups and energy systems for a specific amount of time (8).

METHODOLOGY:

This experimental study was conducted on 30 collegiate Kabaddi players under the supervision of team trainer at the playground of K.G. College of

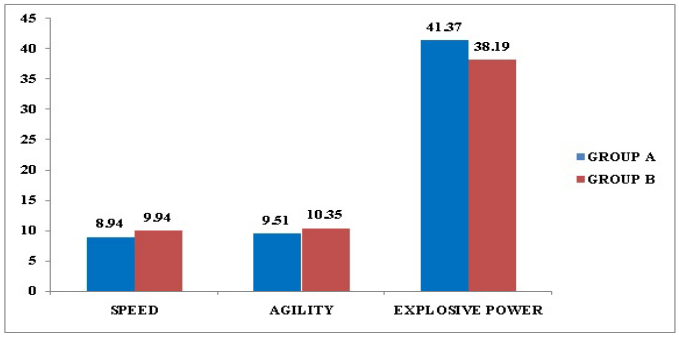
Physiotherapy, Saravanampatti, Coimbatore. A clear explanation was given to every player about the study and a written consent was obtained from them.

The subjects were included based on the inclusion criteria [Healthy active collegiate Kabaddi players who have been participating in Kabaddi for the last 2 years with age ranging between 18 to 25 years and male players] and exclusion criteria [Players involved in any type of Plyometric and Circuit training before, Players with any kind of lower limb injury, Players with history of any chronic disease, Players with history of any congenital deformities and Players with any kind of respiratory complications].

Players were divided into 2 equal groups based on the convenient sampling method. Players in Group A underwent Plyometric training which includes warm up for 10 minutes, Plyometric training for 40 minutes and cool down for 10 minutes. Players in Group B underwent Circuit training which includes warm up for 10 minutes, Circuit training for 40 minutes and cool down for 10 minutes. Players in both the group underwent the respective training for 60 minutes in a day for thrice a week for 4 weeks. The study was carried out for 6 months and baseline characteristics of Speed, Agility and Explosive power were similar in both groups. Pre and post test evaluation of Speed, Agility and Explosive power were measured.

RESULTS:

At baseline, the 60 meter sprint test values were similar and the comparison of the values at the baseline and during the final training session in both the groups revealed that the Plyometric training group increased significantly when compared with Circuit training group ($p<0.05$). A significant increase ($p<0.05$) in Speed was observed by the end of the training program in both the groups. The Agility 'T' test values were similar at the beginning of the study in both the groups. The Agility 'T' test values increased significantly in Plyometric training group than Circuit training group ($p<0.05$). The Agility increased significantly from baseline to the final training session in both the groups. The Sargent jump test values for Explosive power were also similar at the baseline and it increased significantly after the training session in both the groups ($p<0.05$). A significant difference between the groups was observed at the end of the training.



Comparison of the post test values of Speed, Agility & Explosive power in Group A & B

DISCUSSION:

According to Avery D. Faigenbaum et al, Plyometric training has been proposed as a training mode designed to enhance movement patterns that are used in motor activities such as sprinting and jumping. In Plyometric training, the amortization phase between eccentric and concentric movements is shortened, allowing greater power production. By taking advantage of stored elastic energy and the stretch reflex, the muscle is capable of performing more work in the concentric phase. This would allow for improvements in sport performance.

Many studies suggested that Circuit training may be valuable for determining the physical fitness variables such as strength, endurance, agility and speed. Teixeira et al., (2001) pointed out that circuit training three times per week is an effective as five times per week. Strength, Endurance, Agility and speed are considered as the main determinants of sports performance. This improvement in physical fitness is beneficial for athletes who require quick movements while performing their sport (9).

Even though both the training techniques worked significantly, Plyometric training has shown significant improvement both clinically and statistically than Circuit training on Speed, Agility and Explosive power. The limitations of the study are, the study was conducted on a smaller sample size and the age group is limited. Only male collegiate Kabaddi players were included. Only 2 training techniques were used. Future studies are recommended to include female Kabaddi players, players with different age group, larger sample size, other training programs and other outcome measures can also be included.

CONCLUSION:

In conclusion, Plyometric training is more effective in improving the Speed, Agility and Explosive power than Circuit training in Collegiate Kabaddi players.

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EFFECT OF SCAR TISSUE MASSAGE ON POST-CAESAREAN LOW BACK PAIN

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ABSTRACT

BACKGROUND: The Caesarean sections are the common causes of built up scar tissue and low back pain in post-Caesarean women. Scar tissue massage is a form of rehabilitation that uses pulling and stretching to remodel scar tissue. The purpose is to find the effects of scar tissue massage in reducing post-CaesareanLow back pain.

METHODOLOGY: A sample of 20 subjects was selected according to the selection criteria. Group A were treated with Scar tissue massage and conventional exercises and Group B were treated with conventional exercises.

RESULT: Statistical Analysis was made using paired "t" test and independent "t" test at 5% level of significance. Pretest values showed that there is no significant difference between the Groups. After the intervention, the Group A who received Scar tissue massage and conventional exercises showed a significant difference in the reduction of Low back pain than Group B who received the conventional exercises alone.

CONCLUSION: From this study it is concluded that the Scar tissue massage and conventional exercises is more effective in the reduction of Low back pain.

Keywords: Scar tissue massage, Conventional exercises, Low back pain, Numeric Pain Rating Scale, Oswestry Low Back Pain Questionnaire

INTRODUCTION

Caesarean delivery is the common causes of scar tissue and back pain in post-partum women. The National Family Health Survey (NFHS) found that Caesarean section rate in India -17.2% was higher than WHO recommended limit. (Neha Kumari et al., 2021). Abdominal adhesions are common complication of surgery and they are tough tissue bands form between the abdominal tissues and organs.

Fibrinolysis failure leads to the tissue or band to dissolve and develop into adhesions. The complication includes bowel obstruction, low back pain, secondary infertility, infection and urinary incontinence. (Judith H Poole et al., 2013). Scar tissue massage is a way to break up adhesions after surgery (Lipiec J et al.,). Scar tissue massage is a form of rehabilitation that uses pulling and stretching to remodel scar tissue and helps to regain mobility and strength in the damaged tissue. It is different from other forms of massage. Scar massage happens just around and over the scar in order to stretch the scar and bring back normal movement. (Kathe Wallace)

METHODOLOGY:

Study Design: Single-blind Pilot study design

Study Setting: Obstetrics and Gynaecology Department, KG Hospital, KG College of Physiotherapy, Coimbatore.

Study Sampling: Convenient sampling method

Study Duration: The study was conducted for four weeks.

INCLUSION CRITERIA:

- ✔ Age- 25 to 35
- ✔ Underwent Caesarean section within one year
- ✔ Low back pain for six months
- ✔ Willing to do massage and exercises

EXCLUSION CRITERIA:

- ✔ History of two abdominal operations
- ✔ Presence of cancer
- ✔ Undergoing Physiotherapeutic treatments during the study
- ✔ Use of analgesics or muscle relaxants
- ✔ Subjects not involved in massage and exercises

MEASUREMENT TOOLS:

- ✔ Evaluation of the pain intensity with a Numeric Pain Rating Scale, and
- ✔ Objective symptom evaluation using the Oswestry Low Back Pain Questionnaire

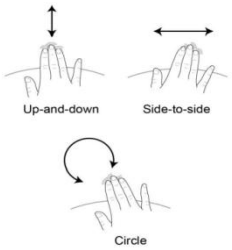
PROCEDURE:

20 subjects were selected according to the selection criteria. They were divided into two groups as Group A and Group B with 10 subjects in each group.

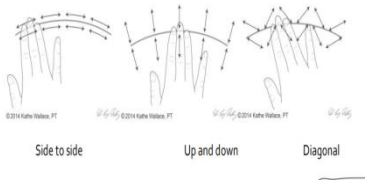
SCAR TISSUE MASSAGE: They were treated with Scar tissue massage and conventional exercises.

There are two stages for massage of abdominal scars:

1) Stage One involves stretching and desensitizing the skin around the scar (5-10 times daily)



2) Stage Two involves stretching and desensitizing the skin directly on/ over the scar (5-10 times daily)



CONVENTIONAL EXERCISES: The conventional exercises are Bridging, Knee to chest, Belly breathing, Knee bending to each sides, Pelvic tilt, Bird dog, Bicycling and Alternate heel touch

BRIDGING	BELLYBREATHING	KNEE BENDING TO EACH SIDES	ALTERNATE HEEL TOUCH

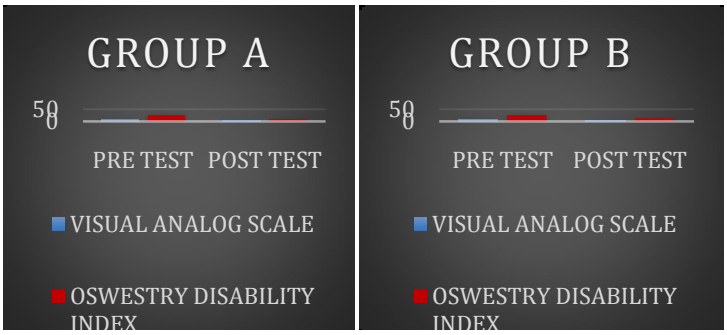
PELVIC TILT	KNEE TO CHEST	BIRD DOG	BICYCLNG

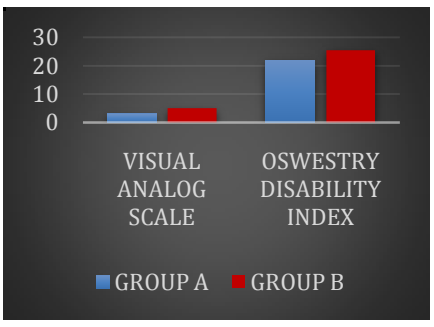
STATISTICAL ANALYSIS:

The collected data were tabulated and analyzed using descriptive and inferential statistics. The following statistical tools were employed to analyze the data and testing of hypothesis. Data analysis was done using Statistical Package for Social Science (SPSS) Software version.

RESULTS:

Statistical Analysis was made using paired "t" test and independent "t" test at 5% level of significance.





DISCUSSION:

Scar tissue massage were used with the intention of improving the gliding layers by breaking up adhesions in the tissue, creating micro-fissures, and setting a localized inflammation process to increase collagen production (T. A. Wynn et al.,2008).Changes in the microstructure may lead to a modification of the macrostructure and allow the tissue to return to its physiological function(Chamorro Comesaan et al., 2017).

The pendulum motion impulses stimulate and ensure the release of peritoneal fluids and hyaluronan, which helps reduce friction between the organs and the peritoneal layers and facilitate gliding (J. O. A. M. van Baal et al., 2016). Because of the anatomic proximity to the abdominal and back musculature , there may be a connection to the thoracolumbar fascia with its many mechanoreceptors and high pain sensitivity, which plays an important role in Low back pain (Van Hoof et al., 2012)

CONCLUSION:

It has been concluded that there is a significant decrease in post-caesarean low back pain in both the groups.Scar tissue massage along with conventional exercise has shown more significant effect on Low back pain.

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IMMEDIATE EFFECT OF MANUAL THERAPY ON RESPIRATORY FUNCTION AND CHEST EXPANSION IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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ABSTRACT

BACKGROUND: Chronic Obstructive Pulmonary Disease (COPD) comprises a diverse group of clinical syndromes that share the common feature of limitation of expiratory airflow. The American Thoracic Society defines COPD in terms of chronic bronchitis and emphysema. Chronic bronchitis is characterized by the clinical symptoms of excessive cough and sputum production; emphysema refers to chronic dyspnea, resulting from enlarged air spaces and destruction of lung tissue. The GOLD initiative defines COPD as "a disease state characterized by airflow limitation that is not fully reversible. The airflow limitation is usually both progressive and associated with an abnormal inflammatory response of the lungs to noxious particles or gases."

METHODOLOGY: 30 subjects with age group 50 – 65 years who were clinically diagnosed with COPD were included in the study. Outcome measures were Peak expiratory flow meter and Inch tape.

RESULT: Paired't' test was used for within-group. The test revealed improvements in peak expiratory flow rate and chest expansion in all subjects.

CONCLUSION:

The study concluded that manual therapy is effective in respiratory functions and chest expansion in patients with COPD.MT should be integrated with pulmonary rehabilitation as a new alternative that produces fast results while motivating patients to continue treatment.

Keywords:Manual Therapy, COPD, Chest expansion, Respiratory functions.

INTRODUCTION

Impaired respiratory function shows a high correlation with morbidity and mortality, and is the main characteristic of Chronic Obstructive Pulmonary Disease

(COPD), along with dyspnea, cough, and increased sputum(Celli BR et al., 2004) . Structural differences in rib cage configuration, forward head posture, shoulder protraction, reduced bone mineral density, and an increased prevalence of vertebral deformities have also been reported in COPD(Kjensli A et al., 2009). Hyperinflation and respiratory muscle fatigue produce hypertonicity in respiratory muscles as well as hypomobility of spinal, costal, and sternal joints that comprise the chest wall. The chest wall mechanics are changed and Chest Wall Rigidity(CWR) occurs in COPD(O'Donnell DE et al., 2007). Manual Therapy (MT) has the potential to increase muscle length and joint mobility. This could be achieved by using joint-focused techniques such as mobilization and manipulation and/or soft tissue techniques such as massage and stretching(Bialosky JE et al., 2009).The mobilization MT of the thoracic spine activates the mechanoreceptor inside the capsule of facet joint which regulate the intrinsic muscle control of the spine but also have some influence to activate the sympathetic nervous system(SNS)(Gordan R et al., 2015).Soft tissue MT was capable of reducing hypertonicity in myofascial tissues . Reduced tonicity in the muscles, fascia and ligaments of the neck and chest would facilitate the respiration (Cho SH et al., 2015).

METHODOLOGY

- **STUDY DESIGN:** Experimental study.
- **STUDY SETTING:** The study was conducted in Department of pulmonology, KG hospital, Coimbatore.
- **STUDY DURATION:** 6 months
- **STUDY POPULATION:** 30 male subjects.
- **TYPE OF SAMPLING:** Convenient sampling.

MEASUREMENT TOOLS

- Peak Expiratory Flow Meter.
- Inch Tape.

OUTCOME MEASURES

- Peak Expiratory Flow Rate (PEFR).
- Chest expansion.

INCLUSION CRITERIA

- Age group 50 - 65 years
- Only males were included for the study.

- Patient with stable vitals at rest
- The potential subjects were considered if they had a known history of COPD. Diagnosis of disease and classification of disease severity were established in line with the Global Initiative for Chronic Obstructive Lung Disease criteria(Am Rev Respir Dis.1991).
- FEV1 ratio of ≤80% of the predicted value after bronchodilator drugs.
- Chest expansion less than 1.5cm

EXCLUSIONCRITERIA

- Unstable medical condition
- Acute bronchitis
- Pneumonia
- An exacerbation of COPD
- Thoracic spinal scoliosis
- Substantial chest wall deformity
- Acute rib or vertebral fracture.
- Unable to perform the pulmonary function test because of cognitive or physical impairments.

INTERVENTION

MANUAL THERAPY PROTOCOL:

All subjects continued their COPD medications until the day of participation in the study.

- Suboccipital decompression,
- gliding of the cervical and thoracic vertebral articulations in the postero-anterior direction,
- gliding of sternoclavicular joint in the anterior & posterior direction
- mobilization of scapulothoracic joint
- Rib rising
- myofascial release of sternocleidomastoid, scalenei, serratus anterior and trapezius muscles, intercostal muscles and paravertebral muscles,diaphragmatic release,

DOSIMETRY OF GLIDING TECHNIQUES

- The gliding techniques were performed for 30 seconds and five times in each joint.

DOSIMETRY OF MYOFASCIAL RELEASE

- The myofascial release techniques were applied, each for ~3–5 minutes.

RESULTS

30 subjects with age group 50 – 65 years who were clinically diagnosed with COPD were included in the study. Outcome measures were Peak expiratory flow meter and Inch tape.Paired ‘t’ test was used for within-group. The test revealed improvements in peak expiratory flow rate and chest expansion in all subjects.

PEAK EXPIRATORY FLOW RATE(PEFR)

The comparison of pre – test and post – test value of Peak Expiratory Flow Rate showed that the calculated ‘t’ value 5.305 is significantly greater than the tabulated ‘t ’value 2.145 at 5% level of significance. This shows that there is significant improvement in peak expiratory flow rate flowing breathing retraining

CHEST EXPANSION

The comparison of pre – test and post – test value of inch tape measurement showed that the calculated ‘t’ value 16.829 is significantly greater than the tabulated ‘t ’value 2.145 at 5% level of significance. This shows that there is significant improvement in peak expiratory flow rate flowing breathing retraining.

DISCUSSION

This study showed that a single MT session immediately improves pulmonary function, chest mobility, and oxygen saturation and reduces dyspnea, heart rate, and respiratory rate in patients with COPD. A previous study, investigating the short-term effect of MT in patients with moderate COPD, administering a soft tissue-based form of MT did not produce any short-term improvements in lung function, dyspnea levels, Combining this with a joint-based form of MT improved the lung functions and dyspnea levels in the short term(Engel RM et al., 2013). According to the study results, a single MT session of soft tissue and joint mobilization immediately improved dyspnea, increases respiratory muscle length and thoracic cage flexibility. These effects reduce the effort of breathing and development of dyspnea in COPD(Engel R et al., 2011). Noll et, al. reported that one-session osteopathic manual treatment was effective in improving static and dynamic pulmonary function in elderly patients with COPD(Noll DR et al., 2008). Similarly, in our study, the difference between dynamic pulmonary function parameters and baseline to post treatment was found to be statistically significant.

MT techniques improve the regulation of the autonomic nervous system. The autonomic system regulates relaxation; therefore, it reduces dyspnea, fatigue and rate of respiration and increases pulmonary function and oxygen saturation(Bockenhauer SE et al.,2002). The results showed that MT had immediate effect on pulmonary function and chest expansion in patients with COPD

CONCLUSION

- The study concluded that manual therapy is effective in respiratory functions and chest expansion in patients with COPD.
- MT should be integrated with pulmonary rehabilitation as a new alternative that produces fast results while motivating patients to continue treatment.

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MULLIGAN VERSUS CONVENTIONAL NEURODYNAMIC MOBILIZATION IN PATIENTS WITH CERVICAL RADICULOPATHY - A RANDOMIZED CONTROLLED TRIAL

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ABSTRACT

BACKGROUND: Cervical radiculopathy is a type of neck disorder. Here a nerve root in the cervical spine becomes inflamed or impinged, resulting in neurological dysfunctions. They may radiate anywhere from the neck into the shoulder, arm, hand, or fingers. While the clinical diagnostic tests of cervical radiculopathy are well established in the literature, studies finding the usefulness of rehabilitation interventions are few. Therefore, the objective of the present study was to compare the effectiveness of mulligan mobilization versus conventional neurodynamics in cervical radiculopathy.

METHODOLOGY:30 subjects with age group 30 – 55 years who were clinically diagnosed with cervical radiculopathy &having one Upper Limb Tension Test positive were included in the study. They were randomized to Mulligan Neurodynamic Mobilization Group or Conventional Neurodynamics Group. The treatment sessions (3 repetitions, 3 sets) in both groups lasted for 5 consecutive days. Outcomes were measured using the Numerical Pain Rating Scale(NPRS) for pain, Cervical ranges, and patient-specific functional scale (PSFS) for disability.

RESULT: Wilcoxon test was used for within-group whereas the Mann-Whitney test was used for between-group comparisons. The test revealed similar improvements in pain and disability in both groups ($p<0.05$); however, the Mulligan Neurodynamic Mobilization Group showed better results in terms of cervical ranges ($p<0.05$).

CONCLUSION*:* Both the techniques were equally effective, but Mulligan Group had better cervical ranges, especially extension, rotation, and lateral flexion.

Keywords*:* Mulligan concept, Neck pain, Patient-Specific Functional Scale, Upper Limb Tension Test.

INTRODUCTION:

Cervical radiculopathy falls under the subgroup of neck disorders. It is defined as the clinical description of when a nerve root in the cervical spine becomes inflamed or impinged, resulting in a change in neurological functions such as numbness, pins and needles sensation, altered reflexes, or numbness that may radiate anywhere from the neck into the shoulder, arm, hand or fingers [1]. The annual incidence rate of cervical radiculopathy is 83 per 100,000 with a prevalence rate of 3.3 cases per 1000 persons and a peak incidence of its occurrence in the 4th& 5th decades of life [2].

Although it has less prevalence than general neck pain, it causes more severe neck pain with disability. The commonest etiology for cervical radiculopathy follows an injury that reduces the intervertebral space and resulting in inflamed cervical nerve root [1]. The main causative factors are cervical disc herniation and spondylosis. Though both genders have equal affliction, the condition presents greater in the 4th and 5th decades of life [3]. A study reported that C5-C6 and C6-C7 are the most commonly involved regions in cervical radiculopathy due to greater mobility permitted in these regions [4].

MULLIGAN NEURODYNAMIC MOBILIZATION:

With Mulligan, neurodynamic Sustained Natural Apophyseal Glides (SNAGs) and neurodynamic Spinal Mobilization with Arm movement can be used. In the Mulligan Neurodynamic Spinal Mobilization with Arm movement technique sustained transverse glide at affected spinous process level is given from affected to unaffected side with patient performing the desired upper limb nerve mobilization test. In the other technique, i.e., Mulligan neurodynamic SNAGs, the affected arm is maintained in the desired neurodynamic test position. The therapist performs SNAGs at the affected facet joint level, with the patient performing the neck movements, which facilitates the opening of the foraminal space [6].

CONVENTIONAL NEURODYNAMICS:

Neurodynamics, also called neural flossing, works to restore the relative gliding of neural tissues on the adjacent mechanical interfaces. This facilitates reduction of nerve mobility restriction, adherence along with promoting neurovascularity [3].

METHODOLOGY

- **STUDY DESIGN**: A Comparative study
- **SAMPLING TECHNIQUE**: Purposive Sampling Technique
- **STUDY SETTING**: KG HOSPITAL, Coimbatore.
- **TREATMENT DURATION**: 3 sets for 5 days.
- **STUDY DURATION**: 6 months.
- **SAMPLE SIZE**: 30athletes; 15ineachgroup
- GROUP A=15participants(Mulligan neurodynamics group)
- GROUP B=15participants(Conventional neurodynamicsgroup)

MEASUREMENT TOOLS

- Numerical pain rating scale (NPRS),
- Patient-specific functional scale (PSFS),
- Cervical ranges using Universal Goniometer.

OUTCOME MEASURES

- Pain
- Disability
- ROM

INCLUSION CRITERIA

- Age : 30 to 50 years,
- Clinically diagnosed with cervical radiculopathy,
- Unilateral radiating pain from neck to upper limb with one ULTT positive.
- Dermatomal involvement of affected nerve root.
- Decreased neck ROM.

EXCLUSION CRITERIA

- Recent injury to the cervical region,
- Myelopathy,
- Upper motor neuron signs like gait changes,
- Hypermobile joints,
- Vertigo.

INTERVENTION

MULLIGAN NEURODYNAMIC MOBILIZATION:

In Neurodynamic SNAGs, Subjects sat on a chair, The affected arm is kept

in a neurodynamic test position below the pain limit, and a glide was given over the facet joint by pushing it towards the eyeball (supero-anteriorly). The patient was asked to actively perform certain specific neck movements to facilitate the opening of foramen, therapist moved their hand along with the movement of the spine to sustain the glide.

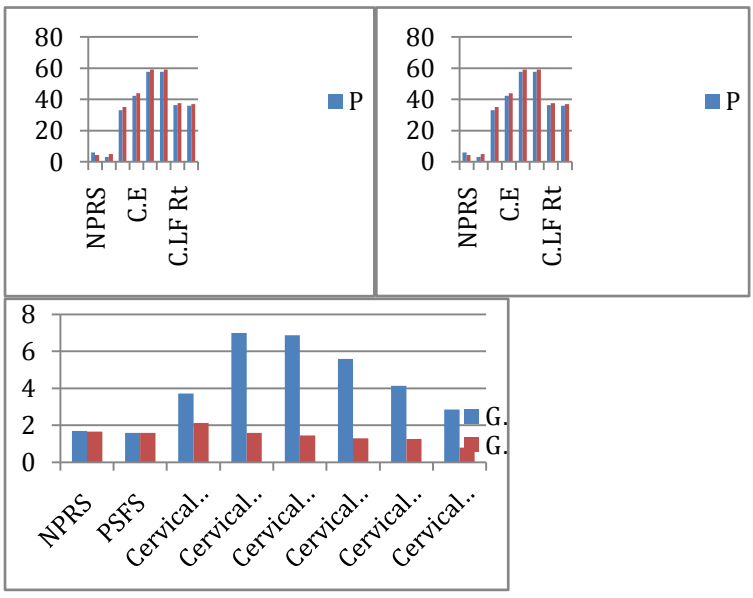
In Neurodynamic SMWAM, Pure transverse glide was given on the affected level spinous process from affected to unaffected side, While the glide was sustained, the patient performed desired neurodynamic movements actively just below the pain limit.

COVENTIONAL NEURODYNAMICS

Subjects lay supine. After identifying the affected nerve involved, neural mobilization was given in a specific sequence of movements. 3 repetitions, 3 sets for 5 consecutive days. Both the groups received similar conventional therapy which included : Hot pack, Upper trapezius stretching, Neck isometrics, Chin tucks and Manual cervical traction.

RESULTS:

A total of 30 subjects participated in the study (15 in the Mulligan Neurodynamic group & 15 in the Conventional Neurodynamic group). There were no lost to follow-ups in either group. Statistical differences were seen for all variables within the groups and between the groups.



DISCUSSION:

In the Mulligan technique group, the improvement in pain and functional disability was reported. Mulligan's Mobilization with Movement involved a combination of active movements done by the patient with simultaneous passive mobilization given by the therapist. This promotes increased sympathoexcitator and analgesic effect, as stated by Vincenzio and Paungmali et al. (2007) [7,14]. Also passive gliding technique might give another description for pain modulation through gate control mechanism as same creates activation of afferent nerve fibers.
This can influence the spinal cord neurons and cause activation of descending pain inhibitory system through the release of serotonin, adrenaline, etc. A study done by Said et al. (2017) had shown the role of accessory glides in improving circulation and nutrition to the joint with the removal of metabolite waste [15]. Sustained glide with distal arm movements to glide the affected nerve or maintaining the arm in the neurodynamic glide position and SNAGs and cervical active movements can help correct positional fault. This happens by separating the facet joints and releasing the entrapped meniscoid to return to its intra-articular position [10].
Also, clinical approaches for cervical radiculopathy commonly include interventions that target increasing the foraminal space to release the entrapped nerve root [1]. As a result, in addition to neural mobilization along with glides, the mobility of the neural root at the interface improved, thus releasing the entrapped nerve and improving its gliding ability

A Conventional Neurodynamic technique in cervical radiculopathy showed altered neurodynamics of the affected nerve root; hence neural mobilization technique can be given. The nervous system should be able to adapt to mechanical loads. It must go through mechanical events like elongation, sliding, angulation, and compression. In the absence of these dynamic mechanisms, the nervous system is prone to neural edema, ischemia, fibrosis, and hypoxia which commonly occurs in cervical radiculopathy. So for restoring the mechanical functions of the affected neural tissues, neural mobilization can be used. Physiologically improved intraneural circulation, axoplasmic flow, and neural connective tissue viscoelasticity help diminish pain and disability [16].

CONCLUSION:

Mulligan Neurodynamic Mobilization techniques were found superior in

improving neck ranges, especially cervical extension, rotation, and lateral flexion in cervical radiculopathy. Concerning pain and disability, either technique had a similar effect in reducing pain and disability.

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SKILL ORIENTED PREVENTIVE STRATEGIES AND ECCENTRIC MUSCLE TRAINING FOR VOLLEYBALL PLAYER WITH SHOULDER INJURY - A SINGLE SUBJECT REPORT

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ABSTRACT

BACKGROUND : Volleyball is a game which played by all age group in all over the world . In competitive atmosphere the collegiate players tend to get injuries , and the main considerable factor is these injuries are cumulative. Trained athletes also get cumulative injuries but prevalence of these kind of injuries are more in collegiate players because of improper skills and lack of adequate training ,this study used to concentrate on correcting the skill as well as giving appropriate training .

METHOD: This is single subject report, The participant was 23 year old collegiate volleyball player. On the clinical examination we find out the player have rotator cuff tendinitis .after the acute management and rest. Eccentric muscle training and improving the skill by proper analysis and correction get started, duration of the study was 2 months. This study is have two outcome measures, one is NPRS(numerical pain rating scale) another one is SPADI(shoulder pain and disability index).

RESULTS: The study is assessing the pain as well as disability, after the training program , the player get improved , the pain get reduced as well the player can perform the game well. Both Pain and activities shows positive improvement.

CONCLUSION: Eccentric muscle training and skill oriented preventive strategies are help full in preventing the injuries as well avoiding the reoccurrence of the injuries on shoulder.

KEY WORDS: Eccentric muscle training, Skill oriented preventive stratergies, Numerical pain rating scale,Shoulder pain and disability index

INTRODUCTION:

Volleyball is a kind of sport which gives a lots of cumulative injuries on soft tissues. according to van mechelens model, one must first understand the injury pattern characteristics of the sport before it is possible to design effective prevention programme.(1).

On an average an elite volleyball athlete is hitting 40,000 spikes in one single season(2). So the cumulative injuries are common in shoulder. Scientific approach on strengthening of muscle is needed. Even though, mitigating the injuries should be based on proper analysis of biomechanical loading of the each joint(3).

Shoulder injuries accounting 8-20% of all volleyball injuries (4)(1). Eccentric training for shoulder shows much good improvement among players(5).

The purpose of this study to investigate the effectiveness of the skill oriented training to reduce more loading on joints and strengthening the rotator cuff muscles by the eccentric exercise by using theraband on reducing the pain and improving the performance of the 23 year old volleyball player who is suffering from shoulder injury for past one year. The study duration was 2 months. The numerical pain rating scale and SPADI(shoulder pain and disability index) score was used as dependent variables.

METHOD

In this study the taken subject was 23 year old student. He is a volleyball player from the age of 15. He continued playing for his college teams. He developed shoulder pain from past one year. The pain was developed due to spiking without proper muscle strengthening. The repeated movements without strengthening commonly ends up with muscle damage. he is playing continuously with the pain, the pain was occurs only while spiking. At rest he doesn't have pain. He doesn't have any past medical history.

On clinical examination he had full range of motion in shoulder. And symmetrical muscle bulk in both the shoulder girdle. he had a definite audible ,"clunk" at 90 degrees, but while in muscle test the right upper trapezius and pectoralis major was tight and serratus anterior and rhomboids was weak .As per kebler classification he have type 2 scapular dyskinesia. painful arc sign and empty can test is positive in his right shoulder. no x-ray and ct were taken, the diagnosis was done by the clinical examination itself By orthopeadician, the subject have scapular dyskinesia and rotator cuff tendinitis. before the intervention, numerical pain rating scale and SPADI score was measured, that is 7

and 44% respectively. As intervention, skill correction and eccentric muscle training were Given, In Eccentric muscle training all rotator cuff muscles along with Deltoid, rhomboids, lattismus dorsi were trained, In the perspective of skill correction, as in picture, player is advised to do hit the ball by doing more extension and rotation of the trunk, which Reduce the load on the Deltoid, rhomboids shoulder and take more power from core muscles and Lattismus dorsi.

Study Design:

An A-B single subject Experimental design was used. baseline phase was taken before intervention

The intervention was given to the subject for 2 months, after the intervention post intervention phase scores were taken.

Equipment: Theraband was used for the eccentric muscle training program and the aapherd skill evaluation system was used to correct the improper skills, for correcting the improper skills the video analysis was used and it was helpful in correcting the skill to the proper manner.

MEASUREMENT TOOLS:

Numerical pain rating scale is used to quantify the pain intensity as per the patients subjective response, this is 11 point scale (0-10) higher the score is indicating the more pain(6).

Shoulder pain and disability index(SPADI) was used to document the pain and disability of the shoulder(7). Higher scores indicate a greater level of pain and disability (0 to100).

RESULTS:

the pre test score of NPRS is 7 and SPADI is 44%. After the intervention period the post test was conducted and documented. in post test score of NPRS is 3 and SPADI is 18%.

DISCUSSION:

Giving rest and reduce the volume of training should help in reduce the overload and helps in a greater opportunity of tissue recovery(burkhat et al)(8). Eccentric muscle training was helpful in cultivate the coordinated function , strength and endurance in scapular and rotator cuff muscles (9).

it is a scientific approach to reduce the overload by analyzing the kinetics and kinematics. reduced internal rotation of the shoulder and reduction in thoracic extension will results in shoulder injury among spikers. Less internal rotation will

generate Lower torque production ,which is leads more torque in external rotation (10)(11). This will give minimal retroversion of the gleno humeral so the posterior shoulder girdle was stressed a lot. The repetitive motions of this improper skills will results in shoulder injuries(12)(13)(14). Increased trunk movements will helps in creating a momentum to hit the ball which is helpful in reduce load on the joints.

CONCLUSION:

Most of the soft tissue injuries occurs cumulatively due to repetitive actions. Proper strengthening exercises and reducing the stress over each soft tissues will helpful in reducing the injury. this study proves that the skill management in any game along with proper exercises will helpful in mitigating the chances of getting injuries And correcting the improper skills is one of the key to reduce the pain as well as helpful in avoiding the reoccurance.

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EFFECT OF CIRCUIT TRAINING IN CARDIOVASCULAR ENDURANCE IN OVERWEIGHT COLLEGE STUDENTS

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ABSTRACT

BACKGROUND: Cardio vascular endurance is defined as the ability of heart, blood cells and lungs to supply oxygen rich blood to the working muscle tissue and ability of the muscle tissue to use oxygen to produce energy from the movement. Research suggests that reduced cardiac fitness will increase the risk of cardiovascular diseases associated with the increases BMI [16].Improvement in the cardiovascular endurance reduce the risk of developing heart disease by increasing the efficiency of the heart.This study is done to enhance the cardiac endurance and as a preventive measure for the cardiovascular diseases.

METHODOLOGY: A group of 20 members were taken for the experiment. All the 20 members were given the circuit training exercise pre and post test were taken to analyse the cardiac fitness using harward step test.

RESULT: There was a significant difference between pre-test and post-test values when evaluated with Harvard step test. A statistically significant improvement was obtained in students with cardiovascular efficiency (paired 't' test value t = 2.33)

CONCLUSION:This study shows significant improvement in cardiovascular finess and endurance.

KEYWORDS: cardiovascular fitness, harvad step test, over weight college students

INTRODUCTION

Overweight referred as pre-obesity is measured with BMI is body mass index which has been used in the classification of the obesity status. [1] Developing countries like India, are being recognized that people with the age of 18-25 and above are more vulnerable group of unhealthy lifestyles leading to overweight and obesity. Young adults between the age of 18-25 is the period of transition from the

adolescence and the adulthood. Obesity and overweight are seen in the middle age adults. However, most common in the young adults between college and university students is evident i.e., concluded by the studies taken among the university students in India engaging high prevalence of overweight with percentage of 17.8-29.6% [2,3].

Studies proves that Obese and overweight individuals have lower cardiac fitness than the lean individuals. Cardio vascular endurnce is defined as the ability of heart, blood cells and lungs to supply oxygen rich blood to the working muscle tissue and ability of the muscle tissue to use oxygen to produce energy from the movement.

Circuit training

Circuit training is the form of exercise training in which several different forms of exercises are included and is performed usually at an intensity equivalent to the force that is generated by the participating muscle. Short session containing repetitions of each exercise are incorporated with the period of rest, during which time the individual moves from one station to another [4].

Harvard step test

Harvard step test is a method used to assess the cardiovascular fitness. The test is simple to conduct and requires minimal equipment. participants step up and down for 20 steps/ min for 5 mins.

MATERIAL AND METHODS

STUDY DESIGN: Pre-test and post-test experimental study design.

STUDY SETTING: The study was conducted in the outpatient department of KG college physiotherapy, Coimbatore.

STUDY DURATION: Study was conducted for the period of 3 months

STUDY SAMPLING: A total of 20 Students were selected using the convenience sampling method based on the selection criteria were included in the study

STUDY DURATION: Study was conducted for the period of 3 months.

Inclusion criteria:

- 18-21 years of age group were selected
- BMI = 25-29.9 kg/m^2
- Students who are willing to participate in this study.
- Students who are medically fit

Exclusion criteria:

- Cardiovascular diseases
- Respiratory diseases like asthma
- Musculoskeletal injury
- Undergone any surgery

OPERATIONAL TOOLS:

- 16” (males) and 12” step (females)
- Stop watch
- Harvard Score sheet

OUTCOME MEASURES:

- Harvard index test - cardiovascular efficiency

PROCEDURE

20 college students were recruited from the kg college of physiotherapy, Coimbatore. A written consent form was given and the exercise protocol was explained to the students Pre-test and post-test measurements were taken pre-test and post-test measurements were taken to analyse the cardiovascular endurance - cardiovascular efficiency from Harvard step test.

Training programs:

Frequency of training: -3 sets per day, 3 times per week, for 6 weeks

Duration of the training: - 30 mins

Circuit training:

Students were given warm up for 5 mins and exercise include

- **wall push up,jump ,squat,step up,crunch,walking lunges,jumping jacks**

DISCUSSION:

Overweight is one of the major risk factors for the cardiovascular diseases and respiratory distress and disorders. Cardio vascular fitness is the ability of the heart, blood cells and lungs to give oxygen to the muscles to produce energy during movement. It increases the quality of life an aspect of blood vessel health is blood pressure. Then circuit training has reduced the overall fat tissue mass, body weight index and metabolic age. It is the good means in the reduction of the body composition in people. Studies show a significant increase in the vascular health and

fitness in the volunteered fire fighters with 4-week circuit training program. The efficiency of the students are improved with the circuit training by enhancing the cardiovascular endurance among school students for 120 subjects with six week protocol .Thus, the circuit training not only improves the cardiovascular endurance but also the strength of the muscle to perform effectively.

RESULTS:

Cardiovascular fitness of 20 subjects is analysed with Harvard step test. The experiment group shows mean of 55.95 and 66.20 in the pre and post test and showed a significant difference in the cardiovascular fitness after the circuit training program.

CONCLUSION:

The study is conducted to find out the effect of circuit training on cardiovascular endurance in the overweight college students with outcome measures – cardiovascular efficiency with Harvard step test.According to the Data Analysis and Interpretation the null hypothesis is rejected and the alternate hypothesis is accepted which states that, "There was a statistically significant improvement in the effect of circuit training in cardiovascular endurance".

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EFFECT OF NEURAL MOBILIZATION ON PAIN AND FUNCTIONAL DISABILITY IN PATIENTS WITH SCIATICA

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ABSTRACT

BACKGROUND: Sciatica is referred as a pain syndrome in which the pain is felt in the lower limb in the absence of any local disturbance. It is commonly seen in patients with low back pain. Mostly it is seen in case of lumbosacral disc herniation or discopathies results in nerve root compression or entrapment. Neural mobilization is an effective treatment in nerve compression disorders. So this study is to find out the effect of neural mobilization in sciatica.

METHOD: This is an experimental study design, a total of 20 sciatica patients were taken and randomly divided into two groups, each group 10 patients. Group A underwent conventional treatment and Group B underwent for neural mobilization. Numerical pain rating scale and Sciatica bothersomeness index are used as outcome measures for pain and function respectively.

RESULTS: This study is done to find out the effect of neural mobilization in patients with sciatica. The post test mean difference value of NPRS in control group is 3.4, in experimental group which is 2. The post test mean difference value of sciatica bothersomeness index in control group is 7.1, in experimental group which is 4.2 (p value > 0.05). Thus this study showed significant improvement in experimental group comparing with control group.

CONCLUSION: Neural mobilization technique is an effective intervention for reduction of pain, functional disability and enhancing the physiological function of the nerve root in Sciatica.

KEY WORDS: NEURAL MOBILIZATION, PAIN, FUNCTIONAL DISABILITY, NUMERICAL PAIN RATING SCALE, SCIATICA BOTHERSOMENESS INDEX, SCIATICA.

INTRODUCTION:

Low back pain is still one of the most severe health problems in all developed societies despite of the increasing knowledge related to spinal diseases. The importance of the problem was attributed to its psychological and socioeconomic effects and lack of the effective treatments that have been suggested. Low back pain affects about 60% to 80% of adults during their life time[5].

Lumbosacral disc herniation, discopathies , or space occupying lesion showed to be responsible for the wide range of the cases of sciatica that lead to inflammation of the nerve root, impingement or both[3] . Sciatica can be considered as a referred pain syndrome in which the pain is reported in the lower limb in the absence of any local disturbance. Studies indicate up to 43% of people experience sciatica pain at some point of their lives — sciatica is a symptom not a diagnosis. About 90% of the time sciatica is due to a spinal disc herniation pressing on one of the lumbar or sacral nerve root. Other problems may result in sciatica include spondylolisthesis, spinal stenosis, piriformis syndrome, pelvic tumours, and compression by a babys head during pregnancy.

Sciatica pain can be described as having two types:

Axial sciatica arises from compression on the nerve roots at the intervertebral foramina of nerves L1 - S3.

Appendicular sciatica is pain from nerve entrapment distal to the nerve root.

Neural mobilization is one of the interventions used for treatment of lumboscral radiculiopathy. It aims to mobilize the peripheral neural tissue and the struc-tures surrounding them thus influencing the mechanical properties of peripheral nerves. When neural mobilization is used for the treatment of adverse neurodynamics, the primary theoretical objective is to attempt to restore the dynamic balance between the relative movement of neural tissues and surrounding mechanical interfaces, thereby allowing reduced intrinsic pressures on the neural tissue and thus promoting optimum physiologic function[4]. Therefore, the purpose of this study is to assess the therapeutic efficacy of neural mobilization for the treatment of altered neurodynamics. Numerical pain rating scale and Sciatica bothersomeness index is

used as the outcome measure to measure the pain and function in patients respectively.

METHOD:

A total of 20 sciatica patients were taken and randomly divided into two groups, each group 10 patients. All 20 patients who satisfied inclusion and exclusion criteria were selected and divided into two groups with 10 in each group using Simple Random sampling method.

Design: Pre-test Post -test Experimental study design. The total study was conducted over a period of three months. Each patient underwent treatment for the duration of four weeks.

Frequency: Eight sessions per week

Duration: 30 seconds hold 1 minute rest

Inclusion criteria: Male and female with age between 25 to 40 years, subjects with radiating pain towards leg since less than 3 months onset, positive neural tissue provocation test, numerical pain rating scale score between 5 to 8.

Exclusion criteria: Deep vein thrombosis, allodynia, severe neuro physiological deficits, musculoskeltal disorders affecting leg, patients with functional limitation

Measurement tools:

- Numerical pain rating scale to measure pain
- Sciatica bothersomeness index to measure functional disability.

Procedure: Group A - control group underwent conventional physiotherapy treatment and Group B — experimental group underwent Neural mobilization along with conventional therapy.

Group A: Interferential therapy, Moist heat therapy and Back strengthening exercises

Group B: Interferential therapy, Moist heat therapy, Back strengthening exercises and Neural Mobilization

<u>Neural mobilization techniques</u>

Patient position is supine lying

SLR with Tibial nerve bias I: SLR+Dorsiflexion+Eversion+Hip abduction and Internal rotation

SLR with Peroneal nerve bias II: SLR+Plantar flexion+Inverion+Hip adduction and internal rotation

RESULTS: The post test mean difference value of NPRS in control group is 3.4, in experimental group which is 2. The post test mean difference value of sciatica bothersomeness index in control group is 7.1, in experimental group which is 4.2 (p value > 0.05).

DISCUSSION:

This study was conducted to find out the effect of neural mobilization technique on Sciatica to provide an effective intervention that can reduce the patients suffering and disabilities and provide evidence that the neural mobilization can promote nerve root function. Effectiveness of neural mobilization is thought to be due to neural "flossing" effect, that is, its ability to restore normal mobility and length relationship, and consequently, blood flow and axonal transport dynamics in compromised neural tissue. Neural mobilization is very effective in breaking up the adhesions and bringing about mobility. The results of this study also depict the same.

CONCLUSION:

Both control group and experimental group showed the improvement in pain and functional activity, but neural mobilization group showed a better result than conventional group. Neural mobilization technique is an effective intervention for reduction of pain, functional disability and enhancing the physiological function of the nerve root in Sciatica. The findings of this study provide evidence that neural mobilization agrees with the theory related to such movements.

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EFFECTS OF KINESIO TAPING ON PEAK EXPIRATORY FLOW RATE AND THORACIC EXPANSION IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) PATIENTS

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ABSTRACT

OBJECTIVES: The primary objective of the study was to find out the improvement on Peak Expiratory Flow Rate and Thoracic Expansion in COPD patients were brought about by Kinesio taping and conventional physical therapy.The secondary objective of the study was to find out the effects of conventional physical therapy alone on Peak Expiratory Flow Rate and Thoracic Expansion in COPD patients.

METHODS: A total of 20 subjects who fulfilled the predetermined inclusion criteria were selected and divided into 2 groups by simple random sampling method.Group-A: Kinesio taping and Conventional therapy (Passive Chest Mobilization, Chest Expansion Exercises)Group-B: Conventional therapy (Passive Chest Mobilization, Chest Expansion Exercises).The study was conducted over a period of 6 months. A total of 4 days per week, 1 session per day for 4 weeks.

RESULT: There was a significant difference between the pre and post-therapy scores when evaluated. A statically significant improvement was obtained in Group A which received Kinesio taping, conventional therapy for COPD (Unpaired `t´ test-t value= 2.5871 and 2.1620 for PEFR and Thoracic Expansion respectively with 'p' <0.05)

CONCLUSION: This study concluded that there is a significant effect on Peak Expiratory Flow Rate and Thoracic Expansion in Chronic Obstructive Pulmonary Disease (COPD) patients by Kinesio taping.

Keywords: Chronic Obstructive Pulmonary Disease, Kinesio taping, Peak Expiratory Flow Rate, Thoracic expansion

INTRODUCTION

Chronic obstructive pulmonary disease exacerbation is an acute event characterized by a worsening of the patient's respiratory symptoms that is beyond normal day to day variations and leads to a change in medication [Vestboet al.,2013].

The event is an important cause of hospital admission and has a considerable impact on patient's health status [Burge and Wedzicha, 2003]. During COPD exacerbations, the maximal pressures that can be generated by the respiratory muscles are reduced, as well as the muscle efficiency for the inspiratory muscle, especially the diaphragm. Mainly COPD is caused by smoking, exposure to work place dusts found in coal mining, gold mining, and the cotton textile industry and chemicals such as cadmium, and fumes from welding have been implicated in the development of airflow obstruction. Bronchial hyper responsiveness is a characteristic of asthma.

In COPD, repeated exposure to airway irritants perpetuates an ongoing inflammatory response that never seems to shut itself off. Overtime, this process causes structural and physiological lung changes that get progressively worse. An inflammation continues, the airway becoming excessively narrow and swollen this leads to excess mucus production and poorly functioning cilia, a combination that makes airway clearance especially difficult when people with COPD cannot clear their secretions they develop the hallmark symptoms of COPD, including a chronic, productive cough, wheezing and dyspnea.Finally, the buildup of mucus attracts a host of bacteria that multiply in the warm, moist environment of the airway and lungs. The end result is further inflammation, the formation of diverticula in the bronchial tree and bacterial lung infection a common cause of COPDexacerbation. Shortness of breath, chronic and progressive dyspnea, chronic cough, sputum production, wheezing and chest tightness.

COPD is diagnosed through spirometry. The presence of post-bronchodilators FEV1/FVC <0.70 confirms the presence of persistent airflow limitation. There have criteria called GOLD criteria (global initiative for chronic obstructive lung disease) used clinically to determine the severity of expiratory flow obstruction for patient with COPD. Should not be used to diagnose COPD, but rather to categorize clinical severity to inform prognosis and to guide therapeutic interventions.

Additionally, dynamic hyperinflation further shortens the inspiratory muscles and causes functional muscle weakness [Gayan-Ramirez andDecramer, 2013]. In acute exacerbations of COPD, physiotherapy interventions (Example: breathing exercises and early mobilization) aim to restore or maintain muscular function. Physiotherapists frequently use these strategies to relieve dyspnea, improve Thoraco-

abdominal co-ordination and enhance functional capacity in patients with COPD exacerbations [Holland, 2014].

Some recent studies have shown improvement in musculoskeletal Disorders while using Kinesio taping [Anandkumar, Sudarshan, and Nagpal, 2014; Cho, Kim, and Yoon, 2015; Kelle, Guzel, and Sakalli, 2016]. Kinesio taping promote changes in muscle activation, reduction of abnormal muscular tension,and joint repositioning, among other effect [Kase, Wallis, and Kase 2003]. The Kinesio taping application may cause of small immediate increase in muscle strength by pulling on the fascia. Reflecting on these precious studies, we speculated if Kinesio taping applied on the chest could bring some beneficial effect for thoracic muscles, resulting in improved comfort for patients with COPD exacerbation. A previous study using Kinesio taping applied on the chest of healthy individuals during heavy exercise has shown augmented ventilatory efficiency.

METHODS: A total of 20 subjects who fulfilled the predetermined inclusion criteria were selected and divided into 2 groups by simple random sampling method.Group-A: Kinesio taping and Conventional therapy (Passive Chest Mobilization, Chest Expansion Exercises) Group-B: Conventional therapy (Passive Chest Mobilization, Chest Expansion Exercises).The study was conducted over a period of 6 months. A total of 4 days per week, 1 session per day for 4 weeks.

Inclusion criteria: 45-55 years of age, both gender ,Clinical diagnosis of COPD by modified Borg scale score decreasedFrom 6.0 at triangle baseline, Symptoms such as wheezing or shortness of breath, cough, changes in color of mucus, amount, thickness indicative of Exacerbation, Spontaneous breathing difficulties.

Exclusion criteria: malignant tumor, blood clot, fistula or radiogenic fibrosis, lymph cyst, allergic to adhesive bandages, wounds, thrombosis, dermatological conditions.

Procedure:

Patients in KG hospital and KG College of Physiotherapy Outpatient department, who have had COPD, registered their name in the outpatient rehabilitation of KG hospital. Instructions were given to the Participants about the study and procedures that will be done to them and they accepted to co-operate with the study. Participants were selected and divided into 2 equal groups. About 20

participants were selected based on the inclusion criteria. All the participants signed the written consent form. They were randomly allocated into 2 groups, 10 participants in group A and 10 participants in group B.Group-A received Kinesio taping and conventional therapy (Passive Chest Mobilization, Chest Expansion Exercises)Group-B received Conventional therapy (Passive Chest Mobilization, Chest Expansion Exercises)

RESULT:

There was a significant difference between the pre and post-therapy scores when evaluated. A statically significant improvement was obtained in Group A which received Kinesio taping, conventional therapy for COPD (Unpaired `t´ test-t value= 2.5871 and 2.1620 for PEFR and Thoracic Expansion respectively with 'p' <0.05)

CONCLUSION:

The conclusion of this study is that there is a significant effect on Peak Expiratory Flow Rate and Thoracic Expansion in Chronic Obstructive Pulmonary Disease (COPD) patients by Kinesio taping.

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RELATIONSHIP BETWEEN PHYSICAL ACTIVITY AND FATIGUE LEVEL AMONG POST COVID-19 PATIENTS

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ABSTRACT

OBJECTIVES: Novel coronavirus is a global epidemic, 2020 is the infectious year worldwide because of outbreak of this viral respiratory disease. The infectious disease COVID-19 spread throughout the world, due to lack of immunity the virus is more susceptible to the people with age group of below 10 years and above 60 years in both gender groups .Most common symptoms are fever, headache, dry cough, loss of taste or smell, shortness of breath, chest pain, fatigue (38% of people reporting symptom).Physical Activity is defined as bodily movement performed by skeletal muscle that demand energy expenditure. During the pandemic caused by COVID-19, people have reduced considerably their mobility and motor activity, which has led to an increase in unhealthy lifestyle habits, raising risk of suffering from diseases.

METHODS: 50 subjects who fulfilled the inclusion criteria were selected by convenient sampling method and the duration of study 6 months.

RESULTS: The value of 'r' is -0.7267, there is a moderate negative correlation, which means there is a relationship between x (International Physical Activity) & y (Fatigue severity scale)

CONCLUSION: This study concludes that there is a significant relationship found when comparing physical activity and fatigue level.

Keywords: Post COVID patients, Physical activity, Fatigue level.

INTRODUCTION

Novel Coronavirus is a global epidemic, 2020 is the infectious year worldwide because of outbreak of this viral respiratory disease. The infectious disease COVID-19 (coronavirus disease 2019) originated from Wuhan (Hubei, China) and spread throughout the world with rapid infection and deaths(1).COVID-19 was acquired from 3-Bronchoalveolar lavage sample of a patient on December

30, 2019 in Wuhan Jingintan hospital(2). Further this virus was found and isolated in lung and intestinal tissues of the challenged animals(3).Due to lack of immunity the virus is more susceptible to the people with the age group of below 10 years and above 60 years or with health conditions like lung or heart disease, diabetes or conditions that affect their immune system. The possible modes of transmission for COVID- 19 including contact, droplet, Airborne, fomite, fecal-oral, Blood borne, mother to child and animal to human transmission. Infection with COVID-19 primarily causes respiratory illness ranging from mild disease to severe disease and death and some people infected with the virus never develop symptoms.

Most infected people will develop mild to moderate illness and recovery without hospitalization. Most common symptoms are fever, dry cough, tiredness. Less common symptoms are aches and pain, sorethroat, diarrhoea, conjunctivitis, headache, loss of taste or smell, a rash on skin. Severe or serious symptoms are difficulty in breathing or shortness of breath, chest pain, loss of movement or speech. On average it takes 5-6 days from when someone is infected with the virus for symptoms to show however it can take up to 14 days. By WHO, fatigue was the third most common symptom of COVID-19 with 38% of people reporting the symptom. Normally it settles after 2 or 3 weeks however in some people it can linger for weeks or months. There are many reasons why people feel fatigued after a COVID infection they are : A Continuing response to COVID virus even though the infection has got better and The effect of a serious illness ,fatigue caused by pneumonia can take up to 6 months to resolve. Scientists around world are working to develop a vaccine to protect people from COVID-19.On January 2021 India started its National vaccination programme against the COVID-19 pandemic. Currently the two vaccines are available to citizens in India include COVISHIELD (or the Oxford-Astrazeneca vaccines model) produced and marketed by Serum Institute of India(SII) and India's homegrown vaccine, COVAXIN, which has been developed by Hyderabad based Bharat Biotech limited. Medications that can be administered to COVID-19 patients are Remdesivir (veklury) is an antiviral drugs that can reduce the intensity and duration of viral infections. Veklury was first drug to have Food and Drug Administration (FDA) approval to treat COVID-19. Dexamethasone is a corticosteroid that can help reduce the length of time on a ventilator and save lives of patients with severe and critical illness, Physical Activity

is defined as bodily movement performed by skeletal muscle that demand energy expenditure. Online communication for work, leisure and children are using the internet for school work and social interaction. During the pandemic caused by COVID-19, people have reduced considerably their mobility and motor activity, which has led to an increase in unhealthy lifestyle habits, raising risk of suffering from diseases.The Physical Inactivity due to sustained quarantine and social distancing can down regulate the ability of organs systems to resist to viral infection and increase the risk of damage to Immune, Respiratory, Cardiovascular, Musculoskeletal systems and Brain. Post- infection recovery has suggested that complications include the development of severe fatigue.

METHODS:

50 subjects who fulfilled the inclusion criteria were selected by convenient sampling method and the duration of study 6 months.

Inclusion criteria: Persons who are recovered from COVID-19 (minimum 1 month), Age group – not exceeding 60 years, both gender, subjects who are not ventilator supported.

Exclusion criteria: Subjects who had stroke attack, psychologically unstable, Post COVID complications such as Acute Myocardial Infarction, Heart failure, Dysrhythmias, Acute respiratory distress, severe oxygen saturation level.

Procedure:

We collected patient's contacts who were admitted in KG Super Speciality Hospital for COVID-19 attack. We provide the International Physical Activity Level (IPAQ) Form and Fatigue severity level (FSS) form to the patients and ask them to fill these forms in order to identify their Physical activity level &Fatigue level. The Fatigue level score was assessed by calculating the average response to the questions (adding up all the answers and dividing by nine)

RESULTS:

The value of 'r' is -0.7267, there is a moderate negative correlation, which means there is a relationship between x (International Physical Activity) & y (Fatigue severity scale).The P value is <.00001. The result is significant at $p<.05$

CONCLUSION:

This study concludes that there is a significant relationship found when comparing physical activity and fatigue level.

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PREVALENCE OF WORK-RELATED MUSCULOSKELETAL DISORDERS AMONG HEAD LAMP AUTOMOBILE ASSEMBLY LINEWORKERS

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ABSTRACT

OBJECTIVES: To find out the most prevalence of Musculo-skeletal injury in Head lamp Automobile Assembly line Workers.

METHODS: A total number of 70 Head lamp Automobile Assembly line workers were approached and the data were collected for this study based on the selection criteria out of 55 members have the musculo-skeletal problems and 15 members doesn't complaint about any musculo-skeletal problems and the duration of study of 4 months.

RESULTS: The Overall distribution of musculoskeletal complaints in which the Ankle/Feet pain first of all the musculoskeletal disorders. 10 participants out of 55 were complaining of Ankle/Feet pain. 9 of the participants complained of pain around the Wrist and Hand. 8 complained of pain in lower back. 7 participants complained of pain in the knee andshoulder.4 participants complained of pain in neck and elbow. 3 participants were complained of pain in upper back and hip/thigh.

CONCLUSION: The study concluded that musculoskeletal problem is more predominant in Head lamp Automobile Assembly line workers. Ankle/Feet pain ranks first among all the problems.

Keywords: Head lamp Automobile Assembly Line workers, Musculoskeletal Disorders, Ankle and Feet pain.

INTRODUCTION

These disorders could cause long term pain, disability and reduction of active life styles. These disorder affect hundreds of million people around the world, musculoskeletal symptoms is a significant problem in automobile assembly line

workers. The work related portion of the Musculoskeletal injuries and resulting disability is potentially preventable and it is mainly to identify and reduce the risk of work related musculoskeletal symptoms specifically repetitive machine paced tasks, forceful exertions, postural stresses, segmental vibration exposures, contact mechanical stresses and other exposures vary among jobs and plants at the beginning of their carriers.(M.Ghasemkhani et al., 2006).The prevalence of Musculoskeletal symptoms is related to physical and psychosocial factors due to repetitive work, duration of employment, no regular exercise, high visual demands leads to work related musculoskeletal disorders. (AkbarAlipour et al., 2008).

The presence of Man power is important for every management to assemble the parts quickly.When a Man power is less the management must decide quickly to find a replacement. To compensate the absenteeism Man power Cross training workers can perform the activity in Assembly Lines. To limit the quality problems the workers can be trained to perform a second task and it should be done judiciously. (R.R.Inman, W.C. JORDAN &D.E.Blumenfeld., International journal of production research volume42, 2004).The Automobile Assembly line Workers jobs mostly related to prolonged standing and walking activities associated commonly with the workers complaints due to improper shoes, obesity, Occupation with prolonged standing ,high impact activities. (Bergenudd et al., 1989). Stationary standing posture in shop floor during monotonous tasks. As in assembly line jobs leads to fatigue, Pain and stiffness in active muscles of leg. (Venkatesh Bala Subramanian etal., International journal of industrial ergonomics 39(5),649, 2009).

Most of the assembly line workers standing for longer duration to perform their job easily. Prolonged standing can affect the workers in term of muscle fatigue, occupational injuries, finally the workers felt tired and discomfort. The problem such as aching feet, low back pain, swollen ankles and calves, leg pain and hip pain. The industrial workers underwent some health problems due to the workload and pressure causing stress. Other than that the workers are not attention to their job this may lead to an injury. (Nurul Hanna Mas'audetal., 2016). Musculoskeletal symptoms are a common occupationally related cause of ill health in the UK. The national survey of work related illness estimated that 1.2 million men and women in 1995 believed themselves to be suffering from musculoskeletal symptoms causes or made worse by work. (Fredriksson K, C Boldt, 2001). The development of musculoskeletal disorders

shows that as per epidemiologic evidence associated with the exposure to biomechanical and psychosocial factors.

Musculoskeletal disorder represents one of the leading causes of occupational injury and disability in the developed and industrially developing countries.(MaulA, Laubli T, 2003).Most commonly the areas of involvement are shoulder, Neck, Back, Knee and Ankles. Cumulative micro trauma to the various areas causes repetitive strain during occupational reasons which is initially neglected results in chronicity of the pain. (US Bureau of Labor Statistics Occupational Injuries and Illness, 1988).Work related musculoskeletal disorders could result in pain, injury, illness, reduced in quality of life and productivity (Bihari etal., 2011).

METHODS:

It is a Convenience sampling method. A total number of 70 Head lamp Automobile Assembly line workers were approached and the data were collected for this study based on the selection criteria out of 55 members have the musculoskeletal problems and 15 members doesn't complaint about any musculoskeletal problems and the duration of study of 4 months.

Inclusion criteria: Headlamp automobile assembly line workers with the Age group between25to35 years, Both the Males and females are included with minimum of 5years of experience and work for more than 8 Hours per day.

Exclusion criteria: Age below 25 years and above 35 years, Deformities due to fracture, Recent injuries, Subjects with congenital Deformities.

Procedure:

The self-reported questionnaire was created, the first part of which questionnaire was focused on demographic details and the second part includes the Nordic musculoskeletal questionnaire. The demographic part was added to know their work and personal habits which was validated by 3 senior physiotherapists who are involved in occupational health research. The questionnaire was distributed to every individual participant. About 5 to 10 subjects were approached personally by the researcher and the questionnaire were explained and filled up by them. The participant was given two days of time before completing the questionnaire. Before

including the subject, clear explanation was given to every individual participant both orally and written consent. Once the questionnaires were collected from the participants a thank you note was given to everyone.

RESULTS:

The results shows that the Overall distribution of musculoskeletal complaints in which the Ankle/Feet pain first of all the musculoskeletal disorders. 10 participants out of 55 were complaining of Ankle/Feet pain. 9 of the participants complained of pain around the Wrist and Hand. 8 complained of pain in lower back. 7 participants complained of pain in the knee andshoulder.4 participants complained of pain in neck and elbow. 3 participants were complained of pain in upper back and hip/thigh.

CONCLUSION:

Based on the analyses, this study concludes that ankle/feet pain is predominant in head lamp automobile assembly line workers.

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PREVALANCE OF LUMBAR LORDOSIS IN HIGH HEEL USERS

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ABSTRACT

Walking is the most common form of human locomotion from a motor control proprioceptive, human bipedalism makes the task of walking extremely complex.It is known that the difficulty of walking in the use of heeled shoes, which alters the natural position of the foot ankle complex.The aim of the study is to find out the prevalence of lumbar lordosis in high heel users.50 subjects were selected based on the selection criteria and their lumbar lordosis angle was measured. Lumbar lordosis is measured using flexible ruler. High heels wearing can also increase lumbar lordosis and thereby increase the compressive force on lumbar vertebrae that are leading towards lumbar spondylosis. This study concludes that use of high heels ends up in increased lumbar lordosis in women.

KEYWORDS: Flexible Ruler, High heels, Lumbar lordosis.

INTRODUCTION

High heeled foot wear is defined as the foot wear having a heel that is higher than the toe. Throughout the history, this footwear is considered as a symbol of sexuality, class and gender. High heeled shoes are a powerful symbol of modern female sexuality that have been shown to increase woman attractiveness to men and influence men behavior towards women in experimental studies. Being associated more with occasions than non-occasions, use of high heels may be as seen as highly desirable and even compulsory at certain workplaces and social events. No doubt high heels have signified femininity and glamour for generations. These fashion footwears are something all girls love without knowing how their “well-heeled-pair” would affect their overall health (1).

High heels wearing can also increase lumbar lordosis and increase compressive force on lumbar vertebrae that are leading towards lumbar spondylosis. Body mechanics are key factor in current population health and wellness (2).

Curvature in the spine is designed to balance the body, to improve flexibility and to absorb stress and equal distribution of the load and weight. Normally there is a lordotic curve present in the lumbar spine. Alteration in the curvature the lumbar spine may result in pathological causes. Although there was no accurate angle measured in the lumbar curvature still the flexible ruler founds that 30^0-40^0 as the normal range. If any angle more than $40^0$is considered to be hyper lordosis (3).

Flexible ruler was first described almost 50 years ago. Now this device is one of the widely used devices to measure the degree of spinal curvature in the sagittal plane. This instrument is described as 40, 50 or 60 cm strip of lead covered with the plastic which can be bent in one plane only and retains in the shape into which it is positioned (4). The flexible ruler is molded according to the contour of the spine of T1, T2, L1, L5 and S2 spinous process and pressed tightly to the body so as to avoid any hollow space between the ruler and the subject skin. Then ruler is removed and the internal edges are tracked in the paper and thus the lumbar curvature marked. Then the lordotic angle of the patient was calculated through the following formula: $\theta=4$ Arc tan $(2H/L)$ θ=angle or magnitude of lordotic curvature; L=curve length, distance between L1and S2; H=height of the curve.

METHODOLOGY

This descriptive study was conducted on 50 subjects who were selected according to the selection criteria. A clear explanation about the study was given to the subjects and an informed consent was obtained from them.The study was conducted at KGISL campus, Saravanampatti, Coimbatore for a period of 3 months. The subjects were included based on the inclusion criteria [The age of the female subjects ranges from 20 to 35, Subjects who use high-heels for more than 2 years, Subjects whose size of the high-heel more than 2.5 inches and the Subjects without any spinal deformity] and exclusion criteria[Subjects with foot deformity like pes cavus and pes planus, Subjects with any type of low back pain, Subjects with any musculoskeletal disorders, Subjects who had undergone any previous surgery, Subjects with any kind of neurological disorders, Subjects with spinal deformity and the Subjects who are not willing to participate]. A self-reported questionnaire was created to get the details about high-heel usage and it was distributed to all the subjects. The lumbar lordosis angle in all the selected subjects were measured using Flexible ruler.

RESULTS

The results of the study are analysed using the descriptive statistics. Age group of the subjects varies from 20 years to 35 years. 42% belongs to 20 years to 25 years and the members are 21 out of 50, 34% belongs to 26 years to 29 years and the members are 17 out of 50 and 24% belongs to 30 years to 35 years and the members are 12 out of 50. Years of using high heels are also analysed to identify whether there is any prevalence of lumbar lordosis with years of high heel usage. It was found out that 26% are wearing high heels for 1to 2 years and the members are 13 out of 50, 28% are wearing high heels for 3 to 5 years and the members are 14 out of 50 and 46% are wearing high heels more than 5 years and the members are 23 out of 50. Duration of wearing high heels per day also analysed in this study to identify whether there is any relevance of lumbar lordosis with duration of wearing high heels. We found that less than 5 hours of wearing high heels had 22% and the members were 11 out of 50, 5 to 8 hours of wearing high heels had 24% and the members are 12 out of 50 and more than 8 hours had 54% and the members are 27 out 50. Lumbar lordosis for high heel users are measured using flexible ruler. We found that 86% participants are with increased lumbar lordosis and the members are 43 out of 50 and 14% of participants are with no change in lumbar lordosis and the members are 7 out of 50.

DISCUSSION

High heeled shoes cause an increase in the lordotic curve of the lumbar spine. Increased ankle plantar flexion causes a kinetic chain of compensation up the lower extremity that ends with hypertonic psoas muscle, producing a lumbar hyperlordosis.A heel is the projection at the back of shoe which rest below the heel bone. The shoe heel is used to improve the balance of the shoe, increase the height of the wearer and alter the posture or other decorative purposes. Sometimes raised, the heel is common to a form of shoe often worn by women, but sometimes by men too(5).A high heeled shoe increases the forward inclination of the trunk and affects parameters characterizing body postures (6).The high heeled shoes greatly affect the lumbar curve, increase loading on tibialis anterior muscle and also disturb the centre of mass of body. Moreover by wearing high heels, posture is not stable and also increases lumbar lordosis and increase compressive force on lumbar vertebrae that are leading towards Lumbar Spondylosis (7).

CONCLUSION

This study concluded that high heel wearing women have increased lumbar lordosis (86%). Proper preventive care through footwear modification should be

incorporated with the high heel wearers to prevent lumbar lordosis and any other injuries in later part of life.

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A STUDY ON BALANCE AND FUNCTIONAL STRENGTH IN PATIENT WITHTYPE II DIABETES MELLITUS WITHOUT PERIPHERAL NEUROPATHY

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ABSTRACT

BACKROUND AND PURPOSE: In developing countries, the proportion of young to middle aged individual with type 2 diabetes mellitus is higher in rate compared to developed countries. (1) The word balance is association with term of stability and postural control. (2) Balance is complex skill that requires the integration of multiple sensorimotor and cognitive processes and age-related deterioration in sensorimotor as well as cognitive systems can disrupt the ability to maintain the balance. The impact of type 2 diabetes on sensorimotor and cognitive system may contribute to balance disturbance in older adult with type 2 diabetes. (3) Individual with type 2 diabetes also have significant loss of muscle strength, increased risk of fall and balance deficit. (4) This study is to find out balance and functional strength in patient with type 2 Diabetes mellitus without peripheral neuropathy.

STUDY DESIGN: Cross sectional study.

METHODOLOGY:A group of 56 patients were selected after consideration of inclusion and exclusion criteria. Balance and functional strength wereassessed for 56 patients, by using Berg Balance Scale and Five time Sit to Stand test.

***RESULT*:** There is medium fall risk in both Balance & Functional strength. The mean value for Balance Scale is 5.4 & Functional strength is 9.

CONCLUSION: This study shows medium fall risk in Balance and Functional strength in patient with type 2 Diabetes mellitus.

KEY WORDS:BALANCE, FUNCTIONAL STRENGTH, TYPE II DIABETES MELLITUS.

INTRODUCTION:

The number of people globally with diabetes mellitus is improved rapidly over the past three decades. (5) There are 51 million people are affected by diabetes mellitus in India based on the DIABETES ATLAS 2009. (6)In short period of time Asia has emerged as the DIABETES EPICENTER in the world as the result of rapid economic development. (7) Older adult with type 2 diabetes has significantly higher incidence of falls than without type 2 diabetes. One of the most commonly identifies risk factor for type 2 diabetes mellitus impaired balance and falls. (9)

BALANCE: Balance is complex skill that requires the integration of multiple sensorimotor and cognitive processes as well as cognitive systems can disrupt the ability to maintain the balance. (10) This vestibular dysfunction is 2.3 times more in individual with diabetes than in those without diabetes. (11)

FUNCTIONAL STRENGTH: Functional strength focuses on how independently patients are able to do their daily activities. The functional strength measured by Five Time Sit to Stand Test (12). There are some changes in the base of support between buttock and feet repeatedly in Five Time Sit to Stand Test.(13)

METHODOLOGY:

STUDY DESIGN: Cross sectional study

STUDY SETTING: Department of OPD, K.G College of Health Science, Coimbatore.

STUDY SAMPLES: Around 65 patients with type 2 diabetes mellitus were assessed. Only 56 patients were selected after due to consideration of inclusion and exclusion criteria.

STUDY DURATION: The study was conducted for a period of 3 months.

STUDY METHOD: Purposive sampling method.

INCLUSION CRITERIA

- Age group of 40-60

- Both gender
- Type 2 diabetes mellitus patient within 6yrs of duration

EXCLUSION CRITERIA

- Patient with peripheral neuropathy
- Patient who are having more than 10 years of type 2 diabetes mellitus
- Impaired cognition (unable to follow simple movement instructions)
- Patient with benign paroxysmal positional vertigo.
- Patient with labyrinthitis and vestibular neuronitis.
- Patient with somatosensory, visual, vestibular disorders.
- Older adults with blurred vision.

OPERATIONAL TOOL

- Stopwatch
- Inch tape

OUTCOME MEASURE:

- Five time sit to stand test (FTST)
- Berg balance test scale

PROCEDURE

All the patient visiting our outpatient department of kg college of physiotherapy who were had the history of type 2 diabetes mellitus were Assessed and subject who fulfilled the inclusion criteria were selected for theStudy. A total number of 56 patient were taken by purposive samplingMethod. A written consent form was obtained from the included patient Before the commencement of the treatment. Balance was assessed by using berg Balance scale. Score was noted. And the functional strength was assessed by five times sit to stand test. The timeTaken to complete the FTSTS is noted by Using stop watch. After that collected data were noted and taken for the analysis.

DISCUSSION:

Maita M. Vaz, BSc, et, al (2013) to assess the influence of diabetic Neuropathy on balance and functional strength in patient with type 2 Diabetes

mellitus. Individual with type 2 diabetes mellitus is compared with control having impaired balance and functional strength. This study Contribute to better understanding of balance functional strength in patient with type 2 diabetes mellitus. However (**HodaSalsabili, MS et, al (2011)** studies examined that type 2 Diabetes mellitus patient is high risk of falling due to decreased accurate Proprioception and also effective balance Training may improve the balance in type 2 diabetes mellitus patient.

RESULT:

56 patients were selected.38% of people having type II Diabetes Mellitus in the age group between 40-45 yrs. 30% of people are having type II Diabetes mellitus within 5 years duration & 29% are having type II Diabetes Mellitus within 3 years of duration. In Berg Balance Scale 84% of people are having medium fall risk (21-40 score). According to our study 71% of people with 41-50 years of duration takes 9 seconds to complete the test which indicates medium fall risk. Mean value for Balance Scale is 5.4 & Functional strength is 9.

CONCLUSION:

Patient with Type II Diabetes Mellitus for more then 6 years are prone to fall in the risk of peripheral Neuropathy. Hence by improving their Balance & Functional strength with exercise before the onset of the disease will prevent them from falling into the risk of Peripheral Neuropathy. This study concludes Type II Diabetes mellitus patients without peripheral neuropathy has medium fall risk in both Balance & Functional strength. This study has put forward the need for further studies to find Balance & Functional strength for the patient having Diabetes Mellitus and to research and treatment for preventing Peripheral Neuropathy.

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PHYSICAL THERAPY IN THE MANAGEMENT OF FROZEN SHOULDER

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ABSTRACT

BACKGROUND: Frozen shoulder is a condition that affects your shoulder joint. It usually involves pain and stiffness that develops gradually gets worse and then finally goes away(1).Frozen shoulder is a self-limiting disease with a chronic character, and is mostly treated in a primary care setting(2). This article elaborates with effectiveness of physical therapy exercises subject with frozen shoulder.

OBJECTIVE: To determine the effectiveness of physiotherapy management with frozen shoulder Methods

METHODS: 5 subjects were chosen, Subjects are treated with VAX Therapy Outcome measures noted using SPADI and VAS before and after 16 treatment sessions that were conducted in 5-week program.

RESULTS: After 16 treatment session, VAX Therapy and exercises had a significant effect in reduction of SPADI and VAS scale and pain reduction of subject affected by frozen shoulder

CONCLUSION: The article show that wax bath with therapeutic exercise are more effective in the subject with frozen shoulder

Keywords: frozen shoulder, adhesive capsulitis, treatment, pathophysiology

INTRODUCTION

Adhesive capsulitis, also known as frozen shoulder, is a condition association with shoulder pain and stiffness . It is a common shoulder ailment that is marked by pain and a loss of range of motion, particularly in external rotation. About 4% of people are affected. It is more common in people 40-60 years of age and in womens's

METHODOLOGY

Sample size

A total number of 5 subjects who were selected considering inclusion criteria

Study duration

The duration of the study was totally 16 treatment sessions that were conducted over 3 days in a week and it was a 5 - week program.

Criteria

Inclusion criteria: Suffered by, Rotator cuff pathologies, Biceps tendinopathy, Calcific tendinopathy, AC joint arthritis, Shoulder shrug sign

Exclusion criteria: Patients Suffered by, cardiopulmonary disease, Cervical disc, CBS Humerus fracture, Parkinson's disease

Treatment procedure

Subject is treated with wax Therapy and exercise.

Outcome measures

- Visual analog scale [VAS]
- Shoulder pain and disability index (SPADI)

DATA ANALYSIS AND RESULT

This chapter includes the statistical analysis of the data collected from 5 frozen shoulder subjects and interpretation of the results in the form of tabular representation.

Statistical Tools

The collected data were subjected to statistical analysis using paired and unpaired t – test to find out the research effectiveness.

RESULT :

The characteristics of the study subjects were as follows in the Table.

Patient age	N	MEAN	STD DEVIATION
Total	5	47.8	11.953

	N	MEAN	STD DEVIATION
Pre test SPADI	5	3.8173	0.7898
Post test SPADI	5	2.1782	0.7698
Pre test VAS	5	4.1782	1.3469
Post test VAS	5	3.7943	0.7321

SPADI	Pre test :4.2573	Post test :2.7321
P- value	0.5467	O.3568

VAS	Pre test 4.2712	Post test 2.4566
P - value	0.5124	0.3215

DISCUSSION

In this study, 5 subjects are obtained successful outcomes, as measured by clinical preductions in SPDI scores and VAS.

RESULTS

Wax Therapy and conventional physiotherapy exercises had a significant effect in reduction of SPDI score in subjects with frozen shoulder

CONCLUSION

The aim of this study was to evaluate the effectiveness of wax Therapy and Conventional Physiotherapy exercise in frozen shoulder. SPADI score and VAS were evaluated at baseline and at the end of one and half months. The result of this study showed significant improvement in SPADI score and VAS of the subject under the frozen shoulder. There were statistically significant differences could be demonstrated at SPADI score and VAS in wax Therapy and physiotherapy exercise . It was concluded that a manual therapy improves the effectiveness of the treatment program of exercises with frozen shoulder

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EFFECTS OF PULSED THERAPEUTIC ULTRASOUND ON THE TREATMENT OF PEOPLE WITH KNEE OSTEOARTHRITIS.

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ABSTRACT

BACKGROUND: The aim was to evaluate the effect of therapeutic ultrasound on the pain, joint mobility, muscle strength, physical function, and quality of life of people with knee.

METHOD: One-site, one-arm, before-after study that included people with Grade II or III tibiofemoral osteoarthritis. Ten therapeutic ultrasound sessions (duty cycle=20%, ERA=10 cm2, BNR=6:1, SATP=2.2 W/cm2, SATA=0.44 W/cm2, frequency=1 MHz, time=4 minutes) were applied. Assessments of primary outcome variables: pain intensity and function, and secondary variables: joint mobility, muscle strength and quality of life, were performed at onset and end of therapy; an additional intermediate evaluation was included for the primary variables.

RESULTS: Means of repeated measurements of pain intensity (pain at rest, pain on palpation and pain after functional activities) and function showed significant differences. There was a significant reduction in pain intensity at the end of functional activities as well as a significant increase in function and in quadriceps muscle strength.

CONCLUSION: Therapeutic ultrasound applied in accordance with the parameters used, could be recommended during the treatment of individuals with knee osteoarthritis, because it significantly decreased the intensity of pain after the 5^{th} session, and this reduction was maintained until the end of the intervention.

INTRODUCTION

Knee joint mobilization can be described as an oscillatory manual force applied to the tibiofemoral, proximal tibio-fibular, or patellofemoral joints, in a variety of directions and positions based on the patient's presentation. Mobilizations to the knee may be applied with several different hand positions or grips.

METHODOLOGY:

Sample size: Totally all these 10 subjects who all are met inclusion criteria were kept under one group.

Study duration:

The duration of the study was totally 18 treatment sessions that were conducted over 3 nonconsecutive days in a week and it was a 6 – week program.

Criteria

Inclusion criteria:

- All subjects diagnosed with osteo-arthritis

Gender: both Male and Female

Age group:

- between 45 to 65 years were eligible for the study.

Exclusion criteria:

- Subject having age less than 45 years or more than 65 years Pain due to neurological, spinal or pelvic origin
- Any other referred pain to hip and knee joint or any other surgery done around knee.
- Intra – articular knee injection within one month of study entry,
- Severe dyspnea at rest,
- The absence of knee pain at the time of recruitment for the study.

Treatment procedure:

1. Ultrasound

Outcome measures:

- Visual analog scale (VAS)

DATA ANALYSIS AND RESULT:

The statistical analysis of the data collected from 10 knee osteoarthritis subjects and interpretation of the results are in the form of tabular representation.

Statistical tool:

The collected data were subjected statistical analysis using paired and unpaired t – test to find out the research effectiveness.

RESULTS

- The characteristics of the study subjects were as follows jn the table

PATIENT AGE	N	MEAN	STD. DEVIATION
TOTAL	10	54.6	6.34

- **Paired sample statistics of the group**

	N	MEAN	STD. DEVIATION	t - value
PRE TEST VAS	10	4.2	1.24	3.4817
POST TEST VAS	10	2.5	0.92	

- **VAS group statistics**

VAS	PRE GROUP 4.2	POST GROUP 2.5
P – VALUE	2.7	0.6

DISCUSSION:

The study was done to find out the effect of pulsed therapeutic ultrasound on the treatment of people with knee osteoarthritis. In this study 10 subject were selected randomly according to inclusion and exclusion criteria. The informed consent form

was obtained from the subject individually. The subjects were treated with ultrasound. The study consists of 18 treatment sessions of 6 week program.

CONCLUSION:

It was concluded that the subjects treated with ultrasound for knee osteoarthritis shows betterment in the movement and reduced pain over knee.

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THERAPEUTIC ULTRASOUND FOR CHRONIC LOW BACK PAIN - OBSERVATIONAL STUDY

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ABSTRACT

BACKGROUND: Chronic non-specific low back pain has become one of the main causes of disability in the adult population around the world. Although therapeutic ultrasound is not recommended in clinical guidelines, it is frequently used by physiotherapists in the treatment of chronic low back pain (1).

OBJECTIVES: The objective of this review is to determine the effectiveness of therapeutic ultrasound in the management of chronic non-specific LBP (1).

METHODS: 10 subjects were chosen , subjects are treated with Ultrasound outcome measures noted using Low Back Pain Rating Scale before and after 18 treatment session that were conducted in 6 weeks program.

RESULT: After 18 treatment sessions, Ultrasound had a significant effect in reduction of Low Back Pain Rating Scale and pain reduction of subject affected by Low Back Pain.

CONCLUSION: The article concludes that the Ultrasound is more affective for the subjects who were affected by Low Back Pain.

INTRODUCTION

Back pain is the pain felt in the back. Lumbar area is most common area affected. The pain may be characterized as dull ache, pain and burning sensation. Low Back Pain is an extremely common presenting complaint that occurs in upward of 80% person (2).

METHODOLOGY

Sample size: Total number of 10 subject were selected considering inclusion criteria.

Study duration:

This duration of the study was totally 18 treatment sessions that were conducted over 3 nonconsecutive days in a week and it was a 6 – week program.

Criteria

Inclusion Criteria:

- Have significant daily chronic pain intensity.
- Interference in performing daily activities due to pain for at least 3 months.
- Are 35-75 years of age.

Exclusion Criteria:

- Meet criteria for alcohol or substance abuse problems.
- Have had Lumbar surgery within past 6 months.
- Have pin due to malignant conditions and rheumatoid arthritis.

Treatment Procedure

Using this experimental, 10 subject undergoes to the treatment of Ultrasound.

Outcomes measures

Low Back Pain Rating Scale is an index scale which includes measurements of pain intensity, disability, and physical impairment.

DATA ANALYSIS AND RESULT

This chapter includes the statistical analysis of the data collected from 10 Low Back Pain subject and interpretation of the results in the form of tabular representation.

Statistical Tool

The collected data were subjected to statistical analysis using paired and unpaired t-test to find out there search effectiveness.

RESULT: The characteristics of the study subjects as were follows in the Table.

PATIENT AGE	N	MEAN	STD. DEVIATION
TOTAL	10	48.9	8.44

- Paired sample statistics of group

	N	MEAN	STD.DEVIATION	t - value
PRE TEST LBPRS	10	5.3	1.2688	2.5999
POST TEST LBPRS	10	3.9	1.1357	

- LBPRS group statistics

LBPRS	PRE GROUP LBPRS	POST GROUP LBPRS
P - VALUE	2.5313	0.2686

DISCUSSION

In this study, 10 subjects are obtained successful outcomes, as measured by clinical production in Ultrasound. Results shows that Ultrasound had a significant effect in reduction of Lower Back Pain Rating Scales score in subjects with Low Bach Pain.

CONCLUSION

The aim of this study was to evaluate the effectiveness of Ultrasound in Low Back Pain. Low Back Pain Rating Scale was evaluated at baseline and at the end of one and half months. The result of this study showed significant improvement in Low Back Pain Rating Scale of the subject under the Low Back Pain.

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MYOCARDIAL INFARCTION – REHABILITATION FOLLOWING MYOCARDIAL INFARCTION

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ABSTRACT

BACKGROUND MYOCARDIAL INFARCTION-or'heart attack'-is atype of acute coronary syndrome in which sudden blockage of a coronary artery,and subsequent myocardial ischaemia,results in damage to the surrounding heart muscle.(1)

OBJECTIVE To prevent life threatening arrhythmias or conduction disturbances.To optimize function and quality of life in thise affliated with a heart disease.

METHODS Using this experimental, 10 subjects were selected to undergo the Rehabilitation of myocardial infarction during post-surgery .

RESULTS After 25 treatment session, subjects with of Myocardial infarction had a significant effect and improve the activity of daily events.

CONCLUSION This study concluded that, cardiac rehabilitation and therapeutical exercise which improves their effieciency of daily activities.

INTRODUCTION

Myocardial infarction (MI), colloguially known as "heart attack" is caused by decreased or complete cessation of blood flow to a portion of the myocardium. Myocardial infarction maybe silent and go undetected, or it could be a catastrophic event leading to hemodynamic deterioration and sudden death(1).

METHODOLOGY

SAMPLE SIZE A total number of 10 subjects who were selected considering inclusion criteria in a group.

STUDY DURATION

Duration of the study was totally 25 treatment sessions that were conducted over 3 nonconsecutive days in a week and it was a 6 - week program.

CRITERIA

Inclusion criteria :

- Poor left ventricular function.
- Extensive coronary disease.
- Viability in at least 4 dysfunctional myocardial segments,that can be revascularised by PCI.

Exclusion critaria:

- Myocardial infarction less than 4 weeks prior to randamisation.
- Valve disease requiring intervention.
- Age less than 18 years.
- Life expectansy less than 1 year due to non-cardiac pathology.

TREATMENT PROCEDURE

- Cardiac rehabilitation.
- Therapeutic exercise.

OUTCOME MEASURES

Myocardial infarction dimensional assessment scale (MIDAS).

DATA ANALYSIS AND RESULT

This chapter includes the statistical analysis of the data collected from 10 myocardial infarction subjects and interpretation of the results in the form of tabular representation.

STATISTICAL TOOLS

The collected data were subjected to statistical analysis using paired and unpaired t-test to find out the research effectiveness.

DISCUSSION

In this study, 10 subjects obtained successful outcome assured by clinical reduction in MIDAS.

Result of this study

The rehabilitation program helps the subject to improve their daily activities and reduction in MIDAS score.

CONCLUSION

The aim of this study was to prevent life threatening arrhymias or conduction disturbances and to optimize function and quality of life in those affiliated with a heart disease.using this experiment , 10 subjects were selected to undergo the rehabilitation of myocardial infarction during post-surgery.The rehabilitation program helps the subject to improve their daily activities and reduction in MIDAS score.This study concluded, cardiac rehabilitation and therapeutical exercise which improves their efficiency of daily activities.

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A STUDY ON THE EFFECTIVENESS OF ACTIVE ASSISTED EXERCISES IN THE MANAGEMENT OF HEMIPLEGIA

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ABSTRACT

BACKGROUND: Stroke is a serious cerebrovascular disease characterized by sudden and acute onset and rapid neurological deficits, which is world's leading cause of disability and second leading cause of death, leaving 80% of patients having varying degrees of life time neurological deficits (1)

OBJECTIVE: The primary aim of people with stroke include being able to walk independently and to manage to perform daily activities consistently rehabilitation program for stroke patients.

METHODS: 5 subjects were chosen who were affected by hemiplegia and were treated with active assisted exercise that was conducted over 18 treatment sessions of consecutive days in 8 week program. Outcome measures are measured using Katz index of independence in activities of daily living.

RESULTS: After 18 treatment sessions, active assisted exercise shows the significant change is detected over the patients who were affected by hemiplegia.

CONCLUSION: This study concluded that the active assisted exercise improves the effectiveness of treatment program and improves the efficiency of the movements of the subjects with hemiplegia.

INTRODUCTION

Hemiplegia is a condition caused by brain damage or spinal cord injury that leads to one sideparalysis. It causes weakness, problems with muscle control and muscle stiffness. The degree of hemiplegia symptoms vary depending on the location and extent of the injury (2).There has been a global rise in the burden of cerebrovascular disease. Stroke continues to be second only to ischemic heart disease in contributing to the global share of deaths since 1990 to 2016 (3).

METHODOLOGY

Sample size

A total number of 5 subjects were chosen for this study ,considering the inclusion criteria.

Study duration

The study consists of totally 18 treatment sessions that were conducted over 5 consecutive days in a week and it was a 8 week- program

Criteria

Inclusion criteria

- Patients with spastic hemiplegia
- Both male and female subjects were slected
- Age limit 35-65 years
- Patients who are bed ridden

Exclusion criteria

- patients more than 65 years
- Hemiplegia with other causes of aneurysm, cardiac disease and brain tumor
- patients with deep vein thrombosis
- patient without co-operative ability

Treatment procedure

The subjects were treated with active resisted exercise and the outcome measures are measured by using Katz index of independence

Outcome measures

Katz index of independence in activites of daily living

DATA ANALYSIS AND RESULT

This chapter includes the statistical analysis of data collected from 10 Hemiplegia subjects and interpretation of the results in the form of tabular representation

Statistical tools

The collected data were subjected to statistical using Katz index of independence

RESULT

The characteristics of the study subjects were as follows in the table

S. No	PRE-TREATMENT SCORE	POST-TREATMENT SCORE
1	3	5
2	2	4
3	2	4
4	2	4
5	3	5

Pre treatment score = 12/5 = 2.4

Post treatment score = 22/5 = 4.4

DISCUSSION

In this study subjects obtained successful outcome as measured by Katz index of independence

The results of this study shows the following

- Active assisted exercise has a significant change in reduction of Katz index of independence scores with Hemiplegia

CONCLUSION

In Hemiplegia activities of daily living are affected .Stiffness, weakness can be overcome by active assisted exercises. Early assessment and diagnosis will recover patient early As soon as treatment is started. There will be quickly relief and recover early. The study proves that active assisted exercise of physiotherapy is improving activities of daily living of patients with hemiplegia.

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