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Flair 2k24

Theme: Trending Technology in Physiotherapy

Date: 7th & 8th November 2024

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Proceedings of International Physiotherapy Conference – *Flair 2k24*
7th and 8th November 2024



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KEYNOTE SPEAKERS

Dr. Elanchezian Chinnavan

AIMST University, Malaysia.

Sensor-Based Innovation for Gait Training in Neurological Rehabilitation

Dr. Arunachalam Ramachandran

College of Physiotherapy, Madhav University,
Rajasthan, India.

"PARAM"

Pain Apprehension Reactivation of Movement

- A novel virtual reality-based intervention for chronic pain

Dr. Premkumar B.N

Kempegowda Institute of Physiotherapy, Bengaluru, Karnataka, India.

**An Overview and Current Insights in Application of Motor Imagery
in Neurological Disorders**

Dr.Esha Arora

AIMST University, Malaysia.

Role of Exercise in Peripheral Arterial Disease with type II Diabetes Mellitus

Dr. Khushboo Thakkar

Founder/Director of Sakhi Women's Health
Surat, Gujarat, India.

Tele rehabilitation for Antenatal and Postnatal Population:

Merits and Demerits.

Dr. Vikrant Bhardwaj

Jeewan Mala Hospital, Karol Bagh, New Delhi, India.

Transforming Rehabilitation: The Role of AI in Advancing Physiotherapy Practices

Dr. Senthil Kumar Elumalai

SDUAHER, Kolar, Karnataka, India.

Physiotherapy Technology Performance Matrix: A Revolution in Healthcare



NEUROBICS: A VITAL ADJUNCT TO PHYSICAL THERAPY IN IMPROVING COGNITIVE AND PHYSICAL FUNCTIONS IN A PREGNANT WOMAN WITH WERNICKE'S ENCEPHALOPATHY - A CASE REPORT.

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ABSTRACT

Background: Wernicke's Encephalopathy (WE) is a neurological disorder caused by thiamine deficiency, leading to cognitive and physical impairments like confusion, ataxia, and ophthalmoplegia. Pregnant women with WE face additional challenges due to pregnancy demands. This case report examines the use of neurobics—cognitive exercises to stimulate brain function - as an adjunct to physical therapy in enhancing cognitive and physical recovery in a pregnant woman with WE.

Objective: This report aims to demonstrate the benefits of combining neurobics with physical therapy to improve cognitive and physical outcomes in a pregnant woman with WE.

Case Presentation: A 28-year-old pregnant woman in her second trimester, diagnosed with WE, presented with confusion, ataxia, and visual disturbances. After stabilization with intravenous thiamine, a rehabilitation program combining neurobics and physical therapy was initiated. Physical therapy targeted balance, coordination, and strength, while neurobics engaged the brain with unusual sensory stimuli and non-routine tasks to enhance cognitive function.

Results: After four weeks, the patient's cognitive function improved, with her MoCA score increasing from 4 to 17. Significant gains were seen in executive function, attention, language, visuospatial skills, and orientation, though memory remained unchanged. Ataxia symptoms also improved, with her SARA score reducing from 22 to 14.

Conclusion: The integration of neurobics with physical therapy offered a comprehensive approach to rehabilitation in this pregnant woman with WE. Neurobics enhanced cognitive recovery alongside physical rehabilitation, suggesting its potential as a valuable adjunct in managing WE.

Keywords: Wernicke's encephalopathy, neurobics, physical therapy, cognitive rehabilitation, pregnancy.



EFFECT OF EARLY MIDRANGE FUNCTIONAL TRAINING FOR UPPER LIMB IN IMPROVING UPPER LIMB FUNCTION AND QUALITY OF LIFE AMONG PATIENTS WITH ACUTE STROKE.

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Background: Stroke also known as brain attack ranks as the second leading cause of death worldwide and is a major cause of disability. The activation and organization of muscle synergies are altered after stroke causing dysfunctional execution of voluntary movements. When corticospinal tract gets damaged after stroke, other descending pathways may be upregulated to compensate. The contribution of these pathways may emerge as new synergies which is result of plasticity along neural axis. This results in loss of independent joint control which disrupts the voluntary movements of upper limb and impairs the quality of life in stroke survivors. The study involves the application of early midrange training for upper limb function and quality of life for patients with acute stroke.

Objective: The review aims to find out the effectiveness of early midrange functional training for the upper limb in improving upper limb motor function and quality of life among patients with acute stroke.

Methods: Participants were selected based on inclusion and exclusion criteria. The selected participants are instructed with early midrange functional training. Early midrange functional training involves the application of suspension therapy and functional activity training. The targeted movements include the shoulder flexion and abduction which is essential for upper limb activity and quality of life in stroke survivors.

Results: Based on pretest and posttest analysis of upper limb function and quality of life using DASH questionnaire and stroke specific quality of life scale, midrange functional training improves the upper limb function and quality of life in acute stroke survivors.

Conclusion: The acute stroke survivors thrive with upper limb disability which impairs the quality of life. The application of midrange functional training in earlier stages is found to be most effective for enhancing the overall health of stroke patients.

Keywords:

Functional training, midrange, acute stroke, quality of life.



INFLUENCE OF POPLITEUS MUSCLE MANIPULATION AND QUADRICEPS STRENGTHENING ON ANTERIOR KNEE PAIN IN RUNNERS

Paulraj Manickavelu ¹, J. Kanagaraj ²

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Background: Anterior knee pain is prevalent among young athletes, with sports-related injuries accounting for 25–30% of cases. Patellofemoral pain syndrome (PFPS) contributes to up to 40% of knee disorders, with annual prevalence rates reported at 22.7% in the general population and 28.9% in adolescents. Among runners, the incidence of PFPS ranges from 37% to 56%.

Objective: The popliteus muscle is primarily associated with anterior knee pain but may also influence posterior knee discomfort. This study aims to investigate the effects of soft tissue manipulation of the popliteus muscle combined with quadriceps strengthening exercises on anterior knee pain in athletic runners, addressing a gap in the literature regarding the interaction between these muscle groups.

Methods: In this experimental study, 30 subjects with non-traumatic anterior knee pain were recruited. Baseline assessments included quadriceps strength and pain levels. Participants then underwent six sessions of popliteus manipulation alongside quadriceps strengthening exercises. Post-intervention, all parameters were reassessed.

Results: A significant reduction in knee pain ($P < 0.005$) was observed after the six-week intervention, with more pronounced improvements in Group A compared to Group B.

Conclusion: The results suggest that incorporating popliteus soft tissue manipulation can effectively reduce anterior knee pain while strengthening the quadriceps enhances muscle function. These findings support the integration of popliteus manipulation into treatment protocols for athletes experiencing anterior knee pain.

Keywords: Popliteus muscle, quadriceps strengthening, anterior knee pain, PFPS.



BIOMECHANICAL ASSESSMENT OF SCAPULAR PLANE ELEVATION EXERCISE WITH DIFFERENT MODES OF RESISTANCE IN SUBJECTS WITH AND WITHOUT IMPINGEMENT SYNDROME.

Tapti Pandit¹, Dr. Meena Makhija², Dr. Vandana Phadke³

¹Student, MPT (Musculoskeletal), ²Assistant Professor, ³Scientist –D, Indian Spinal Injuries Centre- Institute of Rehabilitation Sciences.

Background: Strengthening the rotator cuff and scapular stabilizers is usually prescribed for subjects with shoulder pain and is done either using dumbbells or TheraBand. The resistance offered by elastic Theraband increases with increase in change from initial length and therefore the resistance offered by TheraBand, and dumbbell differs across the range of motion.

Objectives: The purpose of the study is to evaluate the scapular kinematics and activity of prime mover (Anterior Deltoid) while using two different modes of resistance (TheraBand v/s dumbbell) in subjects with and without impingement syndrome.

Methods: Twenty-two asymptomatic subjects and 12 subjects with impingement syndrome were included. 3D motion sensors were attached over the humerus, scapulae and trunk to capture movements of the shoulders as the subject performed scapular elevation without load, with yellow Theraband or 2 Kg Dumbbell. Simultaneous electromyography (EMG) activity of anterior Deltoid was measured and analyzed as percentage of maximum voluntary contraction.

Results: During arm elevation, scapular Upward rotation was significantly greater at 90° with TheraBand[®] as compared to unloaded. It was also greater at 120° as compared to unloaded and dumbbell conditions ($p < 0.001$) during elevation and lowering phase. Scapula upward rotation was significantly lesser at 30° with TheraBand[®] as compared to other conditions.

Conclusion: This study found significant downward rotation and anterior tilt of scapula with TheraBand during lowering phase of exercise as compared to dumbbell and unloaded. The alterations of kinematics may help therapists make informed decisions while making exercise prescriptions.

Keywords: Biomechanics, Shoulder impingement, TheraBand, dumbbell, scapular kinematics, electromyography.



EFFECTIVENESS OF HYPOPRESSIVE EXERCISES ON POSTNATAL MOTHERS WITH URINARY INCONTINENCE-A PILOT STUDY.

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Background: Pelvic Floor Muscle Dysfunctions can lead to Urinary Incontinence, a condition which often affects women both during pregnancy and after childbirth. As a result of this, certain exercises are recommended during and after pregnancy to prevent and treat this incontinence. Hypopressive Exercise is one of these methods used to prevent Urinary Incontinence.

Objective: The purpose of the study is to find the Effectiveness of Hypopressive Exercises on Postnatal Mothers with Urinary Incontinence.

Methods: 30 Mothers (between the age group of 25 – 35 years) clinically pre diagnosed with urinary incontinence with PERFECT score were included in the study. with informed consent, the protocol was explained to the subjects. Mothers were given Hypopressive Exercises for 3 sessions per week for 4 weeks. This session lasted between 30 to 40 minutes. The outcome measure of the Exercises was measured using UI – QUID and PERFECT test. Results were tabulated using statistical analysis.

Result: The analysis shows that the mothers who underwent Hypopressive exercises have significant reduction in urinary incontinence (p-value) $P < 0.0001$.

Conclusion: This study concluded that the mothers underwent Hypopressive exercises have significant reduction in Urinary Incontinence and increase in Pelvic Floor Muscle Strength

Implications: The Hypopressive Exercises strengthens the Deep Core Muscles which increases body awareness by training the Pelvic Floor Muscles in women and reduces Urinary Incontinence. These Exercises not only pay attention to maintaining proper body posture and Pelvic Floor Muscles activation. But also had a positive impact on the Quality of Life and reduction of incidents of urine leakage among mothers.

Key words: Postnatal mothers, Urinary Incontinence, Hypopressive Exercises, Kegels Exercises, PERFECT test, Questionnaire for female Urinary Incontinence Diagnosis (QUID).



A DEVICE-BASED (GAITON) SAGITTAL PLANE KINEMATICS ANALYSIS OF LOWER EXTREMITY JOINTS AMONG PATIENTS WITH KNEE OSTEOARTHRITIS – A METHODOLOGICAL APPROACH.

Sowmiya M¹, Shantanu Sudhakar Patil²

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² Director, SRM Medical College Hospital and Research Centre, SRM Institute of Science & Technology, Kattankulathur, Tamilnadu, India

Background: Gait assessment is an effective method for identifying functional limitations associated with knee Osteoarthritis and understanding the relationship between disease symptoms and gait quality.

Objective: To evaluate the mean difference in the kinematics of lower extremity joints among patients with knee osteoarthritis.

Methods: A total of 20 people living with Knee OA were recruited as of 25th September 2024 in this prospective cross-sectional design study. The eligible participants were conveniently recruited from the SRM physiotherapy OPD based on voluntary participation after signing the informed consent. Adult participants aged 18 years and above, both sexes and able to walk independently without mobility aids were recruited and the joint kinematics were measured using the GaitOn Software, 2-dimensional analysis, and sagittal kinematic parameters of stance phase.

Results: The mean age of the patients was 53.6 ± 7.3 , and the mean BMI was 29.1 ± 4.6 . The one sample t-test demonstrated a statistically significant difference between kinematic angles of the lower extremity joint in sagittal plane of population mean (reference value) and sample mean (measured by GaitOn); Initial contact phase (hip: mean diff -4.06, $p < 0.01$, ankle: mean diff 34.1, $p < 0.0001$), Loading response (hip: mean diff -5.8, $p < 0.001$, knee: mean diff 9.6, $p < 0.001$, ankle: mean diff 32.4, $p < 0.001$). Midstance (hip: mean diff 11.06, $p < 0.001$, ankle: 31.4, $p < 0.001$). Terminal stance (hip: mean diff 28.3, $p < 0.004$, ankle: mean diff 31.4, $p < 0.001$) and Pre-swing (hip: mean diff 16.5, $p < 0.001$, ankle: mean diff 31.4, $p < 0.001$).

Conclusions: The hip and ankle joints equally share knee kinematic compensations. By acknowledging the complex interactions between the hip, ankle, and knee joints, healthcare providers can develop more comprehensive and effective treatment plans for individuals with knee OA.

Keywords: Osteoarthritis, kinematics, gait



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THE ROLE OF COMMUNITY SUPPORT NETWORKS IN ENHANCING PHYSIOTHERAPY REHABILITATION: A SCOPING REVIEW.

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Background: Community supported networks for physiotherapy rehabilitation as an integral component, important interaction, emotional support and shared experience for patients in physiotherapy. Against this background, the goal of this scoping review is to examine recently reported evidence on the effectiveness of support networks in communities in regard to the improvement of outcomes in physiotherapy.

Objective: The review aims to integrate findings from recent studies regarding community support networks during physiotherapy rehabilitation. Potential benefits, challenges, and best practice will be noted.

Methods: Peer-reviewed articles from 2020 to 2024 in several databases, including PubMed, Scopus, and Google Scholar, were accessed to search the literature. Only those studies were considered for this review if they addressed the role of community support networks in physiotherapy rehabilitation for adult patients, documenting the outcomes related to adherence, patient satisfaction, and improvement in functionality.

Results: The major themes emerging include:

1. Increased Adherence,
2. Increased Patient Satisfaction,
3. Improved Function,
4. Challenges and
5. Best Practices.

Conclusion: The physiotherapy rehabilitation will be boosted through community support networks, including social connections, emotional support, and compliance to a treatment plan. All the above challenges need to be addressed, and avenues on how to implement innovative strategies on optimal implementation of the above networks should be ascertained.

Keywords:

Community support networks, physiotherapy rehabilitation, patient adherence, functional improvement, patient satisfaction



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EFFECTIVENESS OF EPLEY MANEUVER AND GANS REPOSITIONING MANEUVER ON DIZZINESS, BALANCE AND KINESIOPHOBIA IN PATIENTS WITH POSTERIOR CANAL BENIGN PAROXYSMAL POSITIONAL VERTIGO.

R. Madhubarathi ¹

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Background: Benign paroxysmal positional vertigo (BPPV) is the most prevalent type of peripheral vestibular vertigo, typically affecting the posterior semi-circular canal.

Objective: The objective of study was to compare the effectiveness of Epley maneuver and Gans repositioning maneuver on dizziness, balance and kinesiophobia in patients with posterior canal BPPV.

Methods: 30 BPPV patients were selected and assigned into two groups based on the selection criteria. Group-A (N=15), received Epley maneuver and 15 were assigned to Group-B, undergone Gans repositioning maneuver, for 20 minutes per session, 3 session (alternate days) per week for 3 weeks. Cawthorne and Cooksey Exercises were given to both the group as common intervention. Dizziness, balance and kinesiophobia were assessed both before and after the 3-week intervention program using Dizziness Handicap Inventory (DHI) scale, Timed-Up and Go (TUG) test and Tampa Scale of Kinesiophobia (TSK), respectively. The collected data were subsequently tabulated and analyzed using appropriate statistical tools.

Results: The unpaired 't' test analysis of dizziness and balance revealed statistically significant scores in DHI($t=2.2259$) and TUG($t=2.2547$), respectively, at a 95% confidence interval. Consequently, Group A demonstrated significant reduction in dizziness and balance improvement in patients with posterior canal BPPV. The scores of Kinesiophobia for both the groups were (A, Mean=31.6; B, Mean= 32.2), which showed no significant difference($t=1.074$), that means the group showed the improvement from baseline.

Conclusion: The study concluded that a 3-week intervention combining the Epley maneuver with Cawthorne-Cooksey exercises was effective in treating dizziness, balance and kinesiophobia in patients with posterior canal BPPV.

Implication: The Epley and Gans maneuvers effectively reduce dizziness and improve balance in patients with posterior canal BPPV. They also may alleviate kinesiophobia, enhancing patient confidence in movement. These interventions highlight the importance of targeted therapy in managing vestibular disorders, promoting functional recovery and quality of life.

Keywords: Posterior canal benign paroxysmal positional vertigo (PC-BPPV), Dizziness, Balance, Kinesiophobia



EFFECT OF EXERCISE ON BURST FREQUENCY A MARKER OF SYMPATHETIC ACTIVITY IN HYPERTENSIVE INDIVIDUALS: A SYSTEMATIC REVIEW.

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Background: Burst frequency is a factor that is used to know the relationship between sympathetic activity and blood pressure in individuals with hypertension. Various forms of exercise reduce the burst frequency among individuals with hypertension. This systematic review provides suggestion of exercise prescription for reducing blood pressure.

Objective: To determine the effects of exercise training and its regulatory mechanisms on burst frequency (BF) a marker of muscle sympathetic nerve activity (MSNA) in hypertensive individuals.

Methods: A systematic literature search of electronic databases such as PubMed, Web of Science and Scopus was conducted from inception to July 2024 included randomized controlled trials (RCTs), non-randomized experimental studies (non-RCTs) or pre-post experimental trials on hypertensive patients without associated metabolic disorders, with or without pharmacological treatment, aged between 18 and 70 years, both genders. Patients underwent at least 4 weeks of aerobic, resistance, or breathing exercises with BF as an outcome measure were included. The Revised Cochrane Risk of Bias tool (RoB 2) and Risk of Bias in Non-randomized Studies of Interventions tool (ROBINS-I) was used to evaluate the risk of bias.

Results: Five trials were included. Four studies demonstrated a significant reduction in BF among exercise-trained hypertensive individuals, while one study reported no change in BF. Overall, two studies had "some concerns" about performance and attrition bias, one had "high RoB" for selection bias, one had "moderate RoB" due to expected confounding, and one had "serious RoB" due to uncontrolled confounding factors.

Conclusion: These findings suggests that HIIT significantly reduces BF, while aerobic and breathing exercises offers lesser benefits, further research should focus on training dosages.

Implications: It provides evidence to utilize tailored exercise programme that may reduce sympathetic overactivity in hypertensive patients for better blood pressure control and reduce cardiovascular risk.

Keywords: Burst frequency, exercise, hypertension, sympathetic activity.



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A PRELIMINARY ANALYSIS ON HOME EXERCISE PROGRAM ADHERENCE IN MIDDLE-AGED ADULTS USING THE EXERCISE ADHERENCE RATING SCALE (EARS) – A RETROSPECTIVE STUDY.

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Background: Adherence to Home Exercise Program (HEP) is crucial for achieving an effective rehabilitation outcome, particularly among middle-aged adults (40-60 years) who have to face many challenges maintaining regular physical activities. Understanding the current adherence levels can inform strategies to enhance participation in HEP regimens.

Objective: The study aims to find the level of adherence in middle-aged adults to HEP using the Exercise Adherence Rating Scale (EARS) through a patient report.

Methods: The study was conducted with middle-aged adults who follow HEP for musculoskeletal conditions. Participants were asked to fill the EARS; to know the level of adherence they have towards home exercise program. Data were collected from patients who approached OPD following a musculoskeletal condition. Descriptive statistics are done with the data collected to analyze the adherence of subjects towards exercise.

Result: From the EARS questionnaire it was analyzed that from a total of 94 subjects present in this study, 76 subjects showed a non-adherent value, and 18 subjects showed adherent value. The average mean value and standard deviation value of the non-adherent group is 11.8 ± 0.607 and 2.701, while for the adherent group it is 19.16 ± 0.385 and 0.833 respectively.

Conclusion: From this study it is known that middle-aged adults are non-adherent to home exercise programs because of which the improvement in the rehabilitation program is not fulfilled.

Keywords: Exercise adherence, middle-aged adults, Home Exercise Program (HEP), Exercise Adherence Rating Scale (EARS)



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EFFECTS OF CALISTHENICS TRAINING ON FLEXIBILITY, MUSCLE STRENGTH, MUSCLE ENDURANCE IN SEDENTARY COLLEGE STUDENTS.

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Background: Calisthenics exercises utilize body weight for resistance and are widely recognized for their ability to enhance strength, endurance, flexibility, and coordination. With increasing sedentary lifestyles among college students, there is a pressing need to explore effective training methods that can promote physical fitness.

Objective: This study aimed to evaluate the effects of a structured calisthenics training program on flexibility, muscle strength, and muscle endurance in sedentary college students.

Methods: Twenty students aged 18-25 years, identified as having a sedentary lifestyle, were recruited for the study. Participants underwent a six-month calisthenics training program that included exercises targeting various muscle groups and flexibility enhancement. The effectiveness of the program was assessed using specific outcome measures: the sit-and-reach test for flexibility, push-ups to gauge muscle strength, and sit-ups to measure muscle endurance. These parameters were recorded before the intervention and after 12 weeks of training.

Results: The results indicated significant improvements in all measured outcomes. Flexibility increased markedly, with a t-value of 40.20. Muscle strength improved significantly, reflected by a t-value of 51.43, while muscle endurance showed substantial enhancement with a t-value of 56.22.

Conclusion: The study concludes that calisthenics training is effective in significantly improving flexibility, muscle strength, and muscle endurance in sedentary college students, highlighting its role in fostering better health outcomes.

Implications: These findings underscore the potential of calisthenics training as an accessible and effective method for improving physical fitness among sedentary college students. This research contributes to the growing awareness of the importance of incorporating regular physical activity into daily routines to promote overall health.

Keywords: Calisthenics, physical fitness, muscle endurance, muscle strength, flexibility.



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EFFECTIVENESS OF SENSORY-TARGETED ANKLE REHABILITATION STRATEGIES VERSUS PROPRIOCEPTIVE TRAINING IN IMPROVING ANKLE FUNCTIONAL PERFORMANCE AMONG ADULTS WITH CHRONIC ANKLE INSTABILITY. A QUICK REVIEW.

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Background: Chronic ankle instability (CAI) is a prevalent condition often resulting from recurrent sprains, negatively impacting daily activities and quality of life. Traditional proprioceptive training enhances motor control, while sensory-targeted ankle rehabilitation strategies (STARS) emphasize sensory feedback for recovery.

Objective: This study aims to compare the effectiveness of STARS and proprioceptive training in improving functional performance, balance, and overall ankle function in adults with CAI.

Methods: Participants diagnosed with CAI, based on scores of 27 or lower on the Cumberland Ankle Instability Tool (CAIT), were recruited for this randomized controlled trial. Individuals with recent ankle injuries, prior surgeries, or conditions affecting motor skills were excluded. Participants were randomly assigned to either the STARS group or the proprioceptive training group. Measurements of balance, mobility, and functional performance were assessed using the Star Excursion Balance Test, the Functional Ankle Ability Measure (FAAM), and various hop tests.

Results: Data analysis will evaluate significant differences in ankle functional performance, balance, and range of motion between the two groups, highlighting the relative effectiveness of STARS compared to traditional proprioceptive training.

Conclusion: This study aims to provide insights into the efficacy of STARS versus proprioceptive training, informing clinical practices regarding optimal rehabilitation strategies for individuals with CAI.

Implications: Findings from this research may enhance rehabilitation protocols, aiding individuals with CAI in regaining stability and functional capacity more effectively.

Keywords: Chronic ankle instability, proprioceptive training, sensory-targeted rehabilitation, functional performance.



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A COMPARATIVE STUDY BETWEEN ARTIFICIAL INTELLIGENCE-BASED EXTRACORPOREAL SHOCKWAVE THERAPY (ESWT) DOSAGE AND PHYSIOTHERAPIST-PLANNED ESWT DOSAGE ON REDUCING PAIN IN PATIENTS WITH LOW BACK PAIN- A QUICK REVIEW.

Lim Qi En ¹, Kshtrashal Singh ², Raja Regan Jeyachandran ³

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Background: Low back pain is a prevalent condition that significantly affects quality of life and functional ability. Extracorporeal shockwave therapy (ESWT) is increasingly used as a non-invasive treatment option. However, determining the optimal dosage for effective pain relief remains challenging. This study explores the potential of artificial intelligence (AI) to enhance the planning of ESWT dosage compared to traditional physiotherapist-driven approaches.

Objectives: The primary objective is to assess the effectiveness of AI in planning ESWT dosages for patients with low back pain. The secondary objective is to investigate the applicability of AI in planning dosages for other electro-modalities in the management of musculoskeletal conditions.

Methods: This study reviews literature on AI-based physiotherapeutic interventions for musculoskeletal conditions. A total of 52 participants of both genders, with low back pain and no contraindications for ESWT, were recruited and divided into two groups. The control group received ESWT dosages planned by physiotherapists, while the intervention group received AI-generated dosages, specifically developed using ChatGPT based on relevant clinical information. Pain levels were measured using the Numerical Pain Rating Scale (NPRS) and the Visual Analog Scale (VAS) before the first session and after the final treatment. Within-group and between-group differences in pain reduction were analyzed.

Results: The literature indicates promising outcomes for AI-planned therapies in various musculoskeletal conditions.

Conclusions: The use of AI in planning ESWT has the potential to yield more effective and personalized rehabilitation plans, enhancing treatment outcomes for patients with low back pain.

Implications: This research highlights the potential of AI in accurately planning electro-modalities protocols, which may reduce the time required for clinicians to design treatment plans and improve overall treatment accuracy.

Keywords: Artificial Intelligence, ESWT, shockwave therapy, physiotherapy, musculoskeletal conditions.



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A COMPARATIVE STUDY ON THE IMMEDIATE EFFECTIVENESS OF MULLIGAN BENT LEG RAISE TECHNIQUE VS PNF HOLD-RELAX WITH AGONIST CONTRACTION IN IMPROVING HAMSTRING RANGE OF MOTION AND MUSCLE PERFORMANCE: A LITERATURE REVIEW.

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Background: Hamstring tightness is a common issue that can hinder athletic performance and increase the risk of injury. Effective interventions are needed to enhance hamstring range of motion (ROM) and muscle performance. This study aims to compare two manual therapy techniques: the Mulligan Bent Leg Raise technique and the PNF Hold-Relax with Agonist Contraction technique.

Objective: The primary objective is to compare the immediate effects of these two techniques on hamstring ROM and muscle performance. Secondary objectives include evaluating participants' perceived comfort during the interventions and exploring the practical application of both techniques in clinical settings.

Methods: A review of literature, focusing on randomized controlled trials involving participants aged 18–35 years, was conducted. Participants were divided into two groups: one receiving the Mulligan Bent Leg Raise technique and the other undergoing PNF Hold-Relax with Agonist Contraction. Pre- and post-intervention measurements of hamstring ROM and muscle performance were collected. Immediate effects were recorded and analyzed to compare outcomes between the two techniques.

Results: Preliminary results indicate significant immediate improvements in hamstring flexibility and muscle performance for both techniques. Literature supports the effectiveness of both the Mulligan and PNF techniques in enhancing hamstring function.

Conclusion: Evidence suggests that both the Mulligan Bent Leg Raise and PNF Hold-Relax with Agonist Contraction techniques effectively improve hamstring flexibility and muscle performance.

Implications: This study provides valuable insights for physiotherapy practice, equipping clinicians with evidence-based strategies to address hamstring tightness and dysfunction. By integrating these techniques, physiotherapists can achieve rapid improvements and enhance overall treatment outcomes.

Keywords: Immediate effect, hamstring flexibility, Mulligan technique, PNF, muscle performance.



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EFFECTIVENESS OF INSTRUMENT-ASSISTED SOFT TISSUE MOBILIZATION (IASTM) VERSUS MAITLAND MOBILIZATION ON PAIN, RANGE OF MOTION, AND FUNCTIONALITY AMONG INDIVIDUALS WITH NON-SPECIFIC NECK PAIN- A QUICK REVIEW ON RANDOMIZED CONTROLLED TRIAL.

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Background: Nonspecific neck pain is the most common symptom resulting from postural and mechanical origin.

Objective: This study aims to compare the effectiveness of Instrument-Assisted Soft Tissue Mobilization (IASTM) and Maitland Mobilization in reducing pain, improving range of motion (ROM), and enhancing functionality in individuals with Non-Specific Neck Pain (NSNP) through various literature reviews. Secondary objectives are to examining the short-term effects of both interventions on patient-reported outcomes.

Methods: A randomized controlled trial (RCT) conducted with 100 participants of University students aged 18-25, diagnosed with NSNP. Participants are randomly assigned to either the IASTM group or the Maitland Mobilization group. The primary outcomes, including pain (Numerical Pain Rating Scale), ROM (Active Cervical ROM), and functionality (Neck Disability Index and Patient-Specific Functional Scale), measured before and after 6 weeks of treatment. Both groups receive their respective treatments once weekly, combined with passive stretching and home exercises.

Results: The study assesses the effects of IASTM and Maitland Mobilization on pain reduction, ROM, and functionality. Data are collected at baseline and after six weeks of intervention, and statistical analysis are performed to compare the outcomes and determine the effectiveness of each treatment method.

Conclusion: The conclusion drawn based on the collected data. The findings provide insights into the comparative effectiveness of IASTM and Maitland Mobilization in treating NSNP, which help inform future clinical decisions and research directions.

Implications: The findings contribute to clinical practice by offering evidence on effective treatment options for NSNP, supporting physiotherapists in optimizing patient care.

Keywords: Neck pain, IASTM, Maitland, ROM, Physiotherapy.



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BARRIERS, KNOWLEDGE AND FACILITATORS OF EVIDENCE BASED PHYSIOTHERAPY PRACTICE IN INDIA.

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Background: Evidence based practice is a method to improve patient outcome by replacing the outdated practice with scientifically validated methods. Barriers, knowledge and facilitator influence evidence-based physiotherapy practice worldwide.

Objective: This study was to explore the barriers, knowledge and facilitator of Evidence Based Practice (EBP) among physiotherapist in India

Methods: A survey was conducted using a structured questionnaire among 50 physiotherapists, 42 responses were collected.

Result: Respondents concurred that EBP is essential for practice, and it is helpful in both decision making and improving patient care. The most common barriers were time and workload constraints, lack of desire, financial incentives, weakness in English, difficulty in access to search engines, inability to apply evidence. The facilitator includes targeting funding, access to remote, supportive staff and leadership committed to innovation and skills in EBP. The knowledge is limited to a few key terms.

Conclusion: Physiotherapists in India have a positive attitude towards EBP, and it is necessary to move towards minimizing the existing barriers at the individual level by adopting effective multilateral policies. Attention is needed to improve EBP knowledge.

Implication: EBP is the integration of best research evidence with clinical expertise and patient values. It provides open and thoughtful clinical decision making about physiotherapy management of patients.

Keyword: Barriers, EBP, Physiotherapist



EFFECTS OF MULLIGAN MOBILIZATION VERSUS SHACKLOCK NEURAL MOBILIZATION ON PAIN AND DISABILITY AMONG INDIVIDUALS WITH SCIATICA.

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Background: Pain and disability are the most common issues reported among individuals with sciatica. Mulligan and shacklock neural mobilization are effective in reducing pain and disability among individuals with sciatica.

Objective: The objective of the study was to find out the effects of mulligan mobilization versus Shacklock neural mobilization on pain and disability among individuals with sciatica.

Methods: This was an Experimental study, 20 individuals with sciatica were recruited based on the inclusion criteria. Group A (n=10) received mulligan mobilization, pain neuroscience education and conventional exercises whereas Group B (n=10) received Shacklock mobilization, pain neuroscience and conventional exercises for 30-40 mins /1 session a day/4 day a week/4 week.

Results: When comparing both the groups, NPRS scores were not statistically significant, but Group A showed significant results on ODI scores at the end of 4 weeks.

Conclusion: Patients treated with mulligan mobilization show more significant improvement than those treated with Shacklock neural mobilization.

Implications: The study shows the use of mulligan mobilization along with pain neuroscience and conventional therapy has significant results.

Keywords: Mulligan mobilization, Shacklock neural mobilization, sciatica, pain neuroscience, conventional therapy.



REMOTE RELIEF: THE INFLUENCE OF TELEREHABILITATION IN THE MANAGEMENT OF KNEE OSTEOARTHRITIS – A SCOPING REVIEW OF RANDOMIZED CONTROLLED TRIALS

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Background: Traditional exercise therapy for knee osteoarthritis (OA) rehabilitation typically involves in-person sessions at clinics or unsupervised home exercises, which may lead to poor adherence and performance. In response, new technologies have been utilized to address these challenges.

Objective: This review aimed to assess the impact of technology-supported exercise programs in managing knee OA.

Methods: The study is registered in OSF. A literature search was conducted in several electronic databases like PubMed, Scopus, CINAHL. The search terms included combinations of keywords and MeSH terms such as "telerehabilitation," "knee osteoarthritis," "knee arthroplasty," "remote rehabilitation," "digital health," "telehealth," and "physical therapy." Articles published in English within the last 10 years were included. 11 studies meeting the inclusion criteria were analyzed.

Results: This overview consolidates findings from 11 studies exploring various telerehabilitation interventions for knee osteoarthritis (OA). These studies, involving different approaches like internet-based programs, telephone consultations, videoconferencing, and blended physical therapy collectively indicate that telerehabilitation can effectively manage knee OA symptoms, including pain reduction and physical function improvement. Preoperative telerehabilitation enhanced muscle strength, range of motion, and functional outcomes in patients preparing for knee arthroplasty, showing potential for optimizing surgical readiness. Remote monitoring after knee arthroplasty also led to positive outcomes, such as quicker discharge to home, reduced hospital readmissions, and a faster return to activities of daily living. The perception of patients about telerehabilitation was found to be good.

Conclusion: The results prove that telerehabilitation is a promising tool in rehabilitation of knee osteoarthritis. Telerehabilitation is effective for pain control, physical function improvement and it is cost effective in knee OA patients.

Keywords: knee osteoarthritis, telerehabilitation, digital health



BRAIN COMPUTER INTERFACE: THE IMPACT ON NEUROPLASTICITY AND MOTOR LEARNING-A NARRATIVE REVIEW.

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Background: Neurological disorders, especially stroke, have now become the major causes of death all around the world. They are also the leading cause of impairments and disabilities among those who survive which leads to dependency in ADL's and an impairment in overall quality of life. Even though traditional rehabilitation techniques and advances in technology (VR/AR/GAMING/ASSISTIVE DEVICES/EXOSKELETONS) play a major role in the recovery process, not all individuals show a 100% positive outcome. Research suggests that the combination of BCI with traditional rehab techniques or advanced technologies help in increasing neuroplasticity by translating the brain signals into commands that can control external devices thereby leading to improved functions and activities.

Objective: The objective of this review is to summarize the available evidence and to highlight the mechanism through which the BCI's promote neuroplasticity and enhance motor functions.

Methods: Articles were searched and reviewed from PubMed, research gate, google scholar using the terms BCI, neuroplasticity, motor functions, neurorehabilitation etc. only the studies which were fully accessible; showed positive outcomes; focusing on motor recovery and neuro rehab were included and the studies which focused on other uses of BCI such as gaming, commercial applications and those that focused on measuring non motor functions and cognitive impairments were excluded.

Results and Conclusion: After reviewing the articles it was concluded that BCI in combination with conventional rehab techniques and advanced technologies promote neuroplasticity thereby improving functions through repeated activation of neurons and improving coordination and motor function by enhancing the brain connectivity.

Implications: The invention of BCI and its combination with other rehab processes aids in the improvement of motor recovery and an overall improvement in ADL's and quality of life of patients suffering from various neurological disorders.

Keywords: Brain computer Interface, Neuroplasticity, Motor functions, Neuro rehabilitation.



EFFECTIVENESS OF CROSS BRACING PROTOCOL FOR ANTERIOR CRUCIATE LIGAMENT (ACL) TEARS - A NARRATIVE REVIEW.

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Background: Anterior cruciate ligament (ACL) injuries are one of the most common knee injuries in sports. ACL injuries have doubled over the last two decades, despite the efforts of researchers and clinicians to mitigate risk. The Cross-Bracing Protocol is a non-surgical treatment for an anterior cruciate ligament (ACL) tear that involves immobilizing the knee at 90 degrees for four weeks and gradually increasing the range of motion via a specific schedule until the full extension is reached and the brace can be removed. The surgery is not the only option for achieving a functional ACL.

Objective: The objective of this review was to explore various articles to determine the effectiveness of the cross-bracing protocol for ACL tears.

Method: This is a narrative review. Articles were searched and reviewed on Google Scholar, PubMed, and Research Gate using terms such as ACL injury, ACL prevalence, cross-bracing protocol, etc. Articles published from 2019 onwards were included. Articles published before 2019 were excluded, and articles on surgical management for ACL were also excluded.

Result: This review states that the cross-bracing protocol is effective in healing non-surgical ACL tears.

Conclusion: After reviewing various articles, it was found that in treating ACL rupture with a cross-bracing protocol, 90% of patients had evidence of ACL healing and associated with better knee function and quality of life, less passive knee laxity and a higher return-to-sport rate.

Implication: Cross-bracing can be a valuable method in managing ACL tears, it should be part of a comprehensive treatment plan that includes medical guidance, rehabilitation, and monitoring.

Keywords: ACL, Cross bracing protocol, Non-surgical.



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EFFECT OF TELEREHABILITATION IN IMPROVING BALANCE ON STROKE PATIENTS: A SYSTEMATIC REVIEW.

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Background: Telerehabilitation have gradually gained popularity after the outbreak of COVID-19. It has been proposed as an effective strategy to deliver post stroke specific exercises.

Objective: Evaluate existing literature on how telerehabilitation improves the balance in stroke patients and identify gaps to guide future research and evidence-based interventions.

Methods: We used electronic databases such as PubMed, Google Scholar, and Cochrane by employing a systematic approach to select studies based on predefined criteria and then perform data extraction to analyze theoretical constructs, research methodologies, and reported outcomes. We used keywords and MeSH terms to retrieve relevant articles related to "TELEREHABILITATION," "TELEREHAB," "STROKE," "CEREBROVASCULAR ACCIDENT," "BALANCE," "STATIC BALANCE," and "DYNAMIC BALANCE." We included articles in English in full text. Only RCT study designs, spanning from 2020 to 2024, are present in the included articles. The abstract or title should include references to stroke, balance, and rehabilitation. The exclusion criteria include non-English publications, studies conducted outside the specified timeframe, insufficient data, and inadequate methodology. The research does not employ telerehabilitation as an intervention and do not include balance as one of the outcome measures

Results: Out of the 4 studies, 3 proved that telerehabilitation improved balance among stroke patients. One study revealed that core-stability exercises along with telerehabilitation improved sitting balance in chronic stroke patients.

Conclusion: This comprehensive analysis finds that telerehabilitation is an effective and promising strategy for enhancing balance in stroke patients. The results indicate that telerehabilitation can attain equivalent, and occasionally superior, outcomes to conventional in-person rehabilitation by providing enhanced accessibility, flexibility, and patient involvement.

Implication: Telerehabilitation provides customized feedback, and allows for frequent, flexible exercise. Additional standardized research is required to enhance telerehabilitation techniques, ensuring optimal benefits and inclusion in stroke recovery pathways.

Keywords- Telerehabilitation, Stroke, Balance.



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BLOOD FLOW RESTRICTION THERAPY: ENHANCING REHABILITATION THROUGH LOW-LOAD TRAINING: A RAPID REVIEW.

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Background: Blood Flow Restriction (BFR) Therapy combines low-load exercise with external pressure to a limb, limiting blood flow.

Objective: The purpose of this review was to analyze the effectiveness of BFR in rehabilitation.

Methods: Literature Search: Electronic databases (PubMed, EMBASE, and the Cochrane Library) were searched without language restriction until September 2024. Eligibility Criteria: Studies that included BFR therapy in Rehabilitation related to training.

Results: studies have shown that combining BFR with low-load resistance training can lead to significant increases in muscle strength and hypertrophy. These gains are similar to those achieved through high-load training. Additionally, there is evidence of improved functional performance, including enhanced mobility and greater proficiency in daily activities. These findings have important implications for rehabilitation, especially for individuals aiming to regain strength for daily activities.

Conclusion: BFR presents significant benefits for individuals recuperating from surgeries such as ACL reconstruction, during which engaging in high-load resistance exercises may be impractical during the early stages of recovery. In comparison to low-load training, low-load BFR training proves to be more efficacious and well-tolerated, thus demonstrating potential as a valuable clinical rehabilitation tool. BFR represents a promising alternative to conventional resistance training, particularly for populations with contraindications for high-load exercises.

Implications: Through the integration of BFR therapy, physiotherapists can expand their treatment modalities, thereby improving patient outcomes while adhering to safe, evidence-based practices. This BFR plays a crucial role in advancing the efficacy and adaptability of rehabilitation techniques within contemporary physiotherapy.

Keywords: Rehabilitation, BFR training, Exercises.



OUTCOME MEASURES FOR CERVICOGENIC DIZZINESS: A META ANALYSIS.

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Background: Cervicogenic dizziness (CGD) is a complex condition characterized by dizziness arising from cervical spine disorders. It affects approximately 40% of patients with chronic neck pain and can significantly impact daily activities, quality of life, and mental health. The involvement of cervical structure in vestibular function highlights the need for effective assessment tools. Outcome measures play a crucial role in diagnosing CGD, evaluating treatment effectiveness, and improving patient outcomes. This evolved, focusing on both subjective and objective assessments, including symptom questionnaires, functional scales, and vestibular function tests. Standardized outcome measures are essential for clinical making and guideline development.

Objective: The objective of the study is to systematically evaluate and compare the reliability, validity and sensitivity data of various outcome measures of cervicogenic dizziness.

Method: The systemic data were searched using PubMed, Scopus, Google scholar, Science direct, PEDro, Cochrane library to identify studies published from the year 2001 up to 2023. Study selection is reported according to PRISMA guidelines. A total of 50 review articles were collected on outcome measures for Cervicogenic Dizziness (CGD). Data extraction included Research, Evidence based study, Literature, Systematic reviews and Meta-analysis articles.

Result: This meta-analysis states that outcomes measures for Cervicogenic Dizziness (CGD) show a highly significant difference.

Conclusion: After analysis of various articles, it was concluded that diagnosing patients with outcome measures for Cervicogenic Dizziness shows highly significant and improving health care efficiency. This study identified reliable and valid outcome measures for assessing Cervicogenic Dizziness (CGD).

Implication: This study findings have significant implication for clinical practice, research, and policy, enhancing diagnosis, treatment and patient outcomes, standardized use of validated outcome measures will inform evidence – based guidelines for Cervicogenic Dizziness.

Keywords: Cervicogenic Dizziness (CGD), Vertebral artery test, Neck pain, Meta – Analysis.



THE COMPARATIVE EFFECTS OF THE JANDA APPROACH AND SWISS BALL TRAINING ON THE STRENGTH OF DYNAMIC MUSCLES AND FLEXIBILITY OF STATIC MUSCLES AMONG COLLEGE STUDENTS WITH LOWER CROSSED SYNDROME.

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Background: Lower crossed syndrome is a muscular imbalance that causes postural changes, reducing muscle strength and flexibility. Janda approach and swiss ball training had been proved to improve muscle strength and flexibility.

Objective: To find the effectiveness of the Janda approach and Swiss ball training on the strength of dynamic muscles and flexibility of static muscles among college students with lower crossed syndrome.

Methods: The study was a comparative study; 30 subjects were selected according to inclusion criteria. They were divided into two groups: Janda approach (GROUP A) and Swiss-Ball training (GROUP B). The treatment was given for 6 weeks. The outcome tools used are MSFGM, MSFAM, MTT, and MST. Materials used were Swiss Ball, Inch tape, Modified sphygmomanometer, and wooden box.

Result: Data analysis was done by paired 't' test and unpaired 't' test for within-group and between-group analysis respectively. The statistical analysis between the Group A [Janda approach] and Group B [Swiss-Ball core strength training] showed significance ($p < 0.001$), which shows that Group A [Janda approach] is significant than Group B [Swiss-Ball core strength training], it has been concluded that Group A [Janda approach] shows impact on improving the strength of dynamic muscles and flexibility of static muscles than Group B [Swiss-Ball core strength training] among subjects with Lower crossed syndrome.

Conclusion: The study concludes that Janda's approach (GROUP-A) shows more beneficial effects than the Swiss-ball core strength training (GROUP-B) on subjects with lower crossed syndrome using the Modified sphygmomanometer for muscle power, Modified Schober test for muscle flexibility, Modified Thomas test for muscle flexibility after 6 weeks of intervention. Hence, the null hypothesis is rejected.

Keywords: lower crossed syndrome, Janda approach, Swiss-ball core strength training, Modified sphygmomanometer, Modified Schober test.



EVALUATING THE EFFECT OF EXERCISE-BASED CARDIAC REHABILITATION ON HOSPITAL ANXIETY AND DEPRESSION SCALE (HADS) IN POST-CORONARY ARTERY BYPASS GRAFTING PATIENTS: A SYSTEMATIC REVIEW.

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Background: Cardiac rehabilitation (CR) offers a comprehensive approach that include exercise training, vocational counseling, psychological support, as well as risk factor modification for patients undergoing coronary artery bypass grafting (CABG). However, the effect of exercise-based CR on hospital anxiety and depression scale (HADS) in post-CABG patients remains underexplored.

Objective: The objective of this systematic review is to evaluate the effect of exercise-based CR on HADS in post-CABG Patients.

Methods: We conducted electronic database searches from PubMed, Web of Science, and Scopus from inception until July 2024 using relevant keywords, following PRISMA guidelines. Out of 3454 articles retrieved, 6 met the eligibility criteria for the present review. Studies that examined the effect of exercise-based CR on anxiety, assessed by the Hospital Anxiety and Depression Scale (HADS) were included. In total, 6 studies were selected for qualitative analysis.

Results: The quality assessment of the included studies was evaluated using the Revised Cochrane Risk of Bias tool (RoB 2 tool). All studies were determined to have a high risk of bias. The findings from three studies revealed that exercise-based CR significantly reduced anxiety scores, while other studies showed significant improvements across all groups.

Conclusions: This systematic review demonstrated that exercise-based CR is effective in reducing anxiety in post-CABG patients.

Keywords: anxiety, cardiac rehabilitation, exercise training, coronary artery bypass grafting.



A STUDY ON THE EFFECTIVENESS OF TREADMILL TRAINING IN IMPROVING GAIT AND MOTOR FUNCTION IN CHILDREN WITH SPASTIC CEREBRAL PALSY - GMFCS LEVEL III AND IV.

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Background: Spastic Cerebral Palsy is a developmental disorder that affects muscle control and movement. Most Cerebral palsy children have impaired gait due to spasticity and muscle weakness. Treadmill has been used for rehabilitation of gait through repeated weight loading on lower extremity.

Objective: This study was done to gain clarity about the aspects of gait rehabilitation using treadmill, specifically in more severely impaired children with CP, in levels of GMFCS III and IV.

Methods: 20 Children with spastic cerebral palsy participated in the study. **Group A**, GMFCS III (n=7) received conventional therapy along with treadmill training, **Group B**, GMFCS III (n=7) received conventional therapy along with over ground walking and **Group C**, GMFCS IV (n=6) received conventional therapy along with BWSTT.

Results: Within the group analysis showed that treadmill training was effective in improving gait (t value 8.573)(p.000) and motor function (t value -5.084) (p 0.002) in Group A (**p < 0.05**), conventional training with over ground walking was effective in improving gait (t 6.049) (p 0.001) in Group B (**p < 0.05**) and that conventional therapy with BWSTT was not effective in improving motor function (t value 0.696)(p 0.518)in Group C (**p >.05**).

Conclusion: It can be inferred that treadmill training as well as over ground walking are both effective measures in improving walking in GMFCS level III. There was no statistical significance in analysis of variance between three groups post intervention, it is concluded that the therapy was not effective in improving gross motor function in both levels of GMFCS.

Key words: Spastic cerebral palsy, Treadmill Training, Gait, GMFCS, GMFM 88.



EFFECT OF STRENGTH TRAINING ON TIME DOMAIN INDICES OF HEART RATE VARIABILITY IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE PATIENTS: A SYSTEMATIC REVIEW.

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Background: Chronic obstructive pulmonary disease is a disease characterized by airflow limitation. Heart rate variability has been recognized as an important variable to determine morbidity and mortality. Exercise training have been shown to improve symptoms of COPD.

Objective: COPD is associated with disruption in autonomic nervous control of the heart rhythm. This systematic review aims to evaluate the effects of resistance exercises on time domain parameters of HRV in COPD individuals.

Method: Following the PRISMA guidelines, we search from inception till June 2024 PubMed, Web of Science, and Scopus databases, using predefined search terms related to resistance training, autonomic function, and COPD. The database search yielded 5158 studies, of which four studies met the inclusion criteria, comprising a total of 129 COPD subjects. Most studies reported positive adaptations following resistance training. The interventions ranged from acute to chronic resistance training, utilizing moderate to high intensity.

Results: Risk of bias was evaluated using the ROBINS-I tool, and the quality of evidence was assessed using the GRADE framework. Most of the studies had a serious risk of bias and included a total of 129 COPD patients. The studies show that resistance exercise programs can improve heart rate variability, specifically SDNN and RMSSD

Conclusion: Despite some heterogeneity and methodological limitations, the findings suggest that resistance training may enhance time domain variables in individuals with COPD, warranting further research to confirm these effects.

Implications: Resistance training may help to reduce risks like heart failure and sudden cardiac death. Clinicians should include resistance training in COPD management, particularly for those with cardiac autonomic dysfunction and muscle weakness

Keywords: Cardiac autonomic function, Chronic obstructive pulmonary disease, Heart rate variability, resistance training and Time domain parameter.



IMPACT OF PROGRESSIVE STRUCTURED EXERCISES ON YOUNG OBESE FEMALES WITH PCOS.

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Background: Obesity, along with elevated levels of anxiety and depression, is prevalent among women with polycystic ovarian syndrome (PCOS). This study utilizes body mass index (BMI) and the Hospital Anxiety and Depression Scale (HADS) as primary outcome measures.

Objective: To assess the effects of a progressive structured exercise program on young obese females diagnosed with PCOS.

Method: This experimental study involved 30 young obese females with PCOS, who were randomly assigned to two groups: GROUP A (n=15), which participated in a progressive structured exercise program, and GROUP B (n=15), which received health education alone, over an 8-week period. Pre- and post-test measurements of BMI and HADS were conducted.

Results: Data were analyzed using unpaired and paired t-tests for between-group and within-group comparisons, respectively. Results indicated a significant reduction in BMI, anxiety, and depression in Group A compared to Group B ($p < 0.001$), demonstrating the effectiveness of the exercise program.

Conclusion: The findings suggest that the progressive structured exercise program (Group A) significantly reduces BMI, anxiety, and depression in young obese females with PCOS compared to the control group (Group B).

Clinical Implications: These results highlight the importance of incorporating structured exercise programs into treatment plans for young obese females with PCOS. Such interventions may not only aid in weight management but also address associated mental health challenges, ultimately improving overall quality of life.

Keywords: Progressive Structured Exercise, Obesity, PCOS, Anxiety, Depression.



RELIABILITY OF INCREMENTAL SHUTTLE WALKING TEST IN RESTRICTIVE LUNG DISEASE: A SYSTEMATIC REVIEW.

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Background: The incremental shuttle walk test is an externally paced field walking test that measures maximal exercise capacity and widely used in patients undergoing pulmonary rehabilitation.

Objective: To evaluate the reliability of the Incremental Shuttle Walk Test (ISWT) in patients with restrictive lung diseases.

Methods: Following PRISMA guidelines, a comprehensive search was conducted across databases such as PubMed, Web of Science, and Scopus up to July 2024. The results were organized in EndNote online. The reliability of the ISWT was assessed primarily through test-retest reliability in studies with participants suffering from restrictive lung diseases. Intraclass correlation coefficients (ICCs) served as the main measure for consistency. The studies included both cross-sectional and longitudinal designs, with repeated ISWT trials. An ICC greater than 0.80 confirmed excellent reliability, emphasizing the ISWT's effectiveness in measuring functional capacity. COSMIN guidelines were applied to evaluate the risk of bias (RoB) in the reliability studies.

Results: The review identified seven studies assessing the test-retest reliability of the ISWT. The ICCs ranged from 0.88 to 0.97, indicating excellent reliability. Singh et al. (2018) reported an ICC of 0.91 (95% CI: 0.81-0.95), demonstrating consistent results between test sessions in patients with restrictive lung disease. These findings validate the ISWT as a reliable measure of exercise capacity in clinical settings.

Conclusion: The ISWT shows excellent reliability in assessing functional exercise capacity in individuals with restrictive lung disease, supporting its clinical use for monitoring disease progression and treatment efficacy.

Implications: The high test-retest reliability of the ISWT underscores its utility as a reliable assessment tool for exercise capacity in clinical settings.

Keywords: Incremental Shuttle Walk Test, reliability, restrictive lung disease, test-retest.



SIGNIFICANCE OF SPORTS-SPECIFIC STRENGTH TRAINING ON DRIBBLING AND SHOOTING IN YOUNG BASKETBALL PLAYERS.

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Background: Dribbling and shooting are fundamental skills for basketball players. This study employs the Dribbling Test and Perimeter Shooting Test as outcome measures to evaluate performance in these areas.

Objective: To assess the impact of sports-specific strength training on dribbling and shooting abilities in young female basketball players.

Method: An experimental study was conducted with 30 female basketball players from the Magic Club team at Indira Gandhi Stadium, Pondicherry. Participants were divided into two groups: Group A (n=15) engaged in medicine ball and resistance band training, while Group B (n=15) performed only warm-up exercises. Training sessions were conducted three times per week over a six-week period. Pre- and post-tests were administered to measure dribbling and shooting performance.

Results: Data were analysed using unpaired and paired t-tests for between-group and within-group comparisons, respectively. Results indicated a significant improvement in dribbling and shooting performance in Group A compared to Group B ($p < 0.01$), demonstrating the effectiveness of the sports-specific strength training.

Conclusions: The findings suggest that incorporating medicine ball and resistance band training (Group A) leads to greater improvements in dribbling and shooting performance in young basketball players compared to traditional warm-up exercises (Group B).

Clinical Implications: These results emphasize the importance of integrating sports-specific strength training into training regimens for young basketball players. Coaches and trainers should consider these methods to enhance skill performance and potentially reduce the risk of injury, thereby contributing to the overall development and competitiveness of young athletes.

Keywords: Medicine Ball, Resistance Band, Dribbling Test, Shooting Test.



TEST-RETEST RELIABILITY OF THE ST. GEORGE'S RESPIRATORY QUESTIONNAIRE IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) PATIENTS: A SYSTEMATIC REVIEW.

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Background: The St. George's Respiratory Questionnaire (SGRQ) is an established tool for assessing health-related quality of life (HRQoL) in patients with Chronic Obstructive Pulmonary Disease (COPD). However, the reliability of this tool, particularly its test-retest reliability across different populations, has shown varying results.

Objective: This systematic review aims to evaluate the test-retest reliability of the SGRQ across different studies involving COPD patients and analyzing its consistency in different settings and patient groups.

Methods: A comprehensive search of electronic databases, including PubMed, Web of Science, and Scopus, adhering to PRISMA guidelines, identified 8 eligible studies involving 534 COPD patients across various countries and healthcare settings. Data were extracted on study design, patient demographics, disease severity (GOLD stages I-IV), and SGRQ administration. Test-retest reliability was evaluated using intraclass correlation coefficients (ICCs) and statistical significance was assessed using p-values.

Results: The SGRQ showed moderate to strong test-retest reliability across studies, with ICC values ranging from 0.54 to 0.98, indicating stability over time. Most studies reported reliability across all GOLD stages of COPD, from stable to acute exacerbations. COSMIN quality assessments showed excellent stability in some studies, though inconsistencies were found, particularly in the symptom subscales.

Conclusion: The SGRQ demonstrates strong test-retest reliability for assessing HRQoL in COPD patients. However, variability in the symptom subscale suggests further research is needed across diverse populations and healthcare settings.

Keywords: COPD, health-related quality of life, test-retest reliability, intraclass correlation coefficient, St. George's Respiratory Questionnaire, SGRQ.



EFFECTIVENESS OF PLYOMETRIC EXERCISE ON LOWER EXTREMITY FUNCTION AMONG CLASSICAL BHARATANATYAM DANCERS.

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Background: Aramandi is the most basic position in Bharatanatyam which is like Demi-plié position of ballet dancers in which both the legs were internally rotated. Gaining proficiency in Bharatanatyam requires rigorous training for prolonged periods of time while maintaining specific postures which begin at a very young age during the adolescent growth spurt.

Objective. To find out the effectiveness of plyometric exercise on lower extremity function among classical Bharatanatyam dancers

Methods. Totally 20 classical dancers were recruited in accordance with inclusion criteria. Classical dancers were given plyometric exercise. Post-test taken for 20 participants with regular follow up. The LEFS questionnaire is an outcome measure that is used before and after the treatment.

Result. The obtained data were analyzed by using paired 't' test comparison of pre and post-test value for LEFS questionnaire the p value is 0.001. Hence, it is concluded that the LEFS questionnaire has highly significant.

Conclusion. This study concluded that plyometric exercise had beneficial effect to shows that there is an improvement on lower extremity function among classical Bharatanatyam dancers.

Keywords. Classical Bharatanatyam Dancers, Plyometric Exercise, LEFS Questionnaire.



ANALYZING THE EFFECTIVENESS OF PROGRAMS ON SHOULDER FUNCTION IN PATIENTS WITH KINESIOPHOBIA.

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Background: Involvement of overhead activities is present in many of the games. In volleyball it's very important. In a competitive atmosphere the collegiate players tend to get injuries, because of that they are developing apprehension. They are becoming kinesiophobia, there are very less studies are available related to this domain,

Objective: This study analyzed the effectiveness of SINEX (Shoulder instability neuromuscular exercises) program on shoulder function in patients with kinesiophobia compared to HOMEX (Home based standard care exercise) program.

Methods: This is an experimental study; participants were volleyball players who is kinesiophobic. Study setting was KG Campus, study duration is 6 months, and Treatment duration is 12 weeks. Total sample size was 22. By using random sampling method, the population divided into two groups. SINEX was given for Group A and HOMEX for Group B. The outcome measures were SPADI (shoulder pain and disability index) and Spiking velocity.

Results: The study assessed the Shoulder function, after the training program, the player improved as well as the player was able to perform the game as well. Both SPADI and spiking velocity show positive improvement. T values of SPADI and Spiking velocity is 11.731 and 2.765 at $p < 0.05$.

Conclusion: SINEX (Shoulder instability neuromuscular exercises) program shows better improvement on shoulder function in patients with kinesiophobia compared to HOMEX (Home based standard care exercise) program.

Key words: SINEX Program, HOMEX Program, KINESIOPHOBIA, TAMPA SCALE, SHOULDER PAIN AND DISABILITY INDEX, SPIKING VELOCITY.



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AUGMENTED REALITY IN PHYSIOTHERAPY REVOLUTION REHABILITATION THROUGH IMMERSIVE TECHNOLOGY

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Background: Physiotherapy is essential for restoring function and mobility in individuals with injuries or disabilities. However, traditional rehabilitation methods can be time-consuming, costly, and may lack effective patient engagement.

Objective: This study aims to explore the potential of Augmented Reality (AR) in enhancing physiotherapy outcomes, boosting patient motivation, and improving the overall rehabilitation experience.

Methods: The approach encompasses several key components: 1) Movement analysis and correction, 2) Pain management and reduction, 3) Balance and coordination training, 4) Virtual exercise programs, and 5) Patient education and engagement. A needs assessment was conducted to identify patient requirements and goals. Customized AR programs were designed to address specific physiotherapy needs, and AR technology was integrated into therapy sessions. Real-time monitoring and feedback were provided, followed by an evaluation of patient progress and program effectiveness.

Results: AR-based interventions demonstrated improved patient adherence and motivation, enhanced movement accuracy and precision, reduced pain and discomfort, increased balance and coordination, and offered personalized, interactive rehabilitation experiences.

Conclusion: Augmented Reality has the potential to transform physiotherapy practices by providing immersive, interactive, and tailored rehabilitation experiences. Its integration into clinical settings can enhance patient outcomes, reduce costs, and improve the overall effectiveness of physiotherapy interventions.

Keywords: Augmented Reality, Physiotherapy, Rehabilitation, Movement Analysis, Pain Management, Patient Engagement.



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ELECTRONIC SENSOR SKIN – REVOLUTIONIZING IT IN THE FIELD OF REHABILITATION

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Background: The development of electronic sensor skin (e-skin) represents a significant advancement in rehabilitation technology. By providing sensory feedback to artificial limbs, it assists amputees, paraplegic individuals, stroke patients, and athletes affected by neurological disorders, enhancing their ability to perceive pressure, temperature, and texture. This innovation aims to improve interaction with the environment.

Objective: This study investigates the efficacy of e-skin in facilitating sensory feedback for users, thereby enhancing their functional capabilities and overall rehabilitation experience.

Methods: An integrated, flexible sensor-embedded skin was developed and applied to wearable robotic systems, specifically exoskeletons designed to augment human physical capabilities. The e-skin serves as an interface for robotics by enabling continuous, non-invasive monitoring through multimodal physical and biochemical sensors. Key materials include advanced substrates and active sensing elements.

Results: The integration of e-skin enables more sophisticated interactions between the device and the user, providing feedback that enhances control, comfort, and responsiveness.

Conclusion: Recent advancements in nanomaterials, organic electronics, and bio-inspired designs have made e-skin more robust, durable, and sensitive to a wide range of stimuli, paving the way for its application in rehabilitation.

Implications: The implications of this technology extend to movement analysis and rehabilitation, real-time biofeedback, nerve stimulation and recovery, adaptive prosthetics and exoskeletons, pain management, and the detection of changes in muscle fatigue or stress.

Keywords: Electronic Skin, Stretchable Circuits, Rehabilitation, Amputees, Paraplegic and Stroke Patients, Personalized Healthcare.



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THE EFFECTIVENESS OF TECAR THERAPY IN MUSCULOSKELETAL DISORDERS.

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Background: TECAR therapy has emerged as a promising treatment modality for various musculoskeletal disorders, leveraging the principles of capacitive and resistive diathermy.

Objective: This study evaluates the effectiveness of TECAR therapy in managing musculoskeletal disorders, including low back pain, tendinopathy, and delayed onset muscle soreness.

Methods: TECAR therapy utilizes capacitance and resistance electrodes to deliver radiofrequency current in the form of thermal energy. The treatment aims to enhance tissue healing and improve mobility.

Results: Findings indicate that TECAR therapy significantly reduces pain, enhances mobility in muscles and joints, and alleviates edema.

Conclusion: TECAR therapy proves to be an effective treatment option in physiotherapy. Its integration into conventional rehabilitation programs or its use as a standalone therapy can yield beneficial short- and long-term outcomes.

Implications: Beyond musculoskeletal disorders, TECAR therapy may also be beneficial in addressing conditions related to adipose tissue reduction, neurological disorders, and sports injuries, indicating its potential for broader therapeutic applications.

Keywords: TECAR Therapy, Capacitive-Resistive Diathermy Therapy, Musculoskeletal Disorders.



VIRTUAL REALITY IN PHYSIOTHERAPY: CURRENT APPLICATIONS

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Background: Recent advancements in virtual reality (VR) technology have the potential to revolutionize rehabilitation practices. This study explores the integration of VR into physical therapy and rehabilitation programs, focusing on its effectiveness in treating musculoskeletal and neurological disorders, as well as its applications in geriatric and paediatric populations.

Objective: This research aims to evaluate the current applications of VR as a treatment modality in healthcare, particularly in physiotherapy, and to investigate the underlying mechanisms of VR analgesia.

Methods: A comprehensive review of the literature was conducted to identify existing research on the use of VR in various rehabilitation contexts. The applications examined include burn injury management, upper limb rehabilitation post-stroke, and interventions for mental health disorders. The study also explores immersive VR interventions for musculoskeletal rehabilitation, highlighting the need for further investigation in this area.

Results: Preliminary findings indicate that VR is increasingly supported by research as an effective treatment modality. The study identifies several mechanisms of action associated with VR analgesia, including the interactions among brain cortices, neurochemistry, and cognitive, emotional, and attentional processes. Various theoretical frameworks, such as Gate Control Theory, Multiple Resources and Mental Workload, Neurobiology of Virtual Reality Pain Attenuation, and Behavioural Health, provide insight into the analgesic effects of VR.

Conclusion: The integration of VR technology in physiotherapy shows significant promise for enhancing rehabilitation outcomes. Continued research is essential to establish best practices and optimize VR interventions for various patient populations.

Keywords: VR Analgesia, Mental Workload, Injury Management, Musculoskeletal Rehabilitation.



CLINICAL RECOGNITION AND DIAGNOSTIC ACCURACY IN STROKE IDENTIFICATION: A META-ANALYSIS STUDY

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Background: Stroke is defined as a focal neurological deficit of sudden onset, typically resulting from cerebrovascular damage. It is a leading cause of morbidity and mortality worldwide, affecting approximately 15 million individuals annually. Survivors often endure significant disabilities, cognitive impairments, and emotional distress. Early intervention is critical, as accurate diagnosis can enable targeted treatment, improving survival rates and reducing long-term disabilities.

Objective: This study aims to evaluate the clinical recognition and diagnostic tests used for stroke diagnosis, assessing their accuracy, effectiveness, and the factors influencing stroke identification.

Methods: A systematic search of articles was conducted across several databases, including Biomed Central, Google Scholar, PubMed, Cochrane Library, American Physical Therapy Association, and PEDRO, focusing on studies published from 2000 to 2023. Keywords such as "stroke prevalence," "transient ischemic attack," and "myocardial infarction" were used to identify relevant literature. Study selection adhered to PRISMA guidelines, resulting in a total of 30 review articles that discussed clinical recognition, diagnostic accuracy, and outcome measures related to stroke identification. Data extraction included evidence-based studies, systematic reviews, and meta-analyses.

Results: The meta-analysis revealed significant differences in the clinical recognition and diagnostic accuracy for stroke identification, underscoring the importance of timely and standardized diagnostic protocols.

Conclusion: This study highlights that enhanced clinical recognition and diagnostic accuracy are crucial for the early identification of stroke, which significantly reduces long-term disabilities and improves patient outcomes. Timely implementation of standardized diagnostic protocols can lead to better patient quality of life.

Implications: The findings of this study advocate for improved clinical practices and policies to enhance stroke diagnosis and optimize patient outcomes through standardized protocols.

Keywords: Stroke, transient ischemic attack, myocardial infarction, diagnostic accuracy, clinical recognition.



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EFFECTIVENESS OF NEUROBIC EXERCISE WITH PROPRIOCEPTIVE NEUROMUSCULAR TRAINING ON BALANCE, SPORTS PERFORMANCE AND STRESS IN FEMALE COLLEGE ATHLETES

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Background : Stress is an emotional state present in a person which is influenced by various factors. Female athletes are more likely to suffer from anxiety and depression twice the rate of male athletes. Stress may affect the balance and sports performance in young female athletes.

Objective: To find out the significance of neurobic exercise with proprioceptive neuromuscular training on improving the balance and sports performance by decreasing the stress in young female college athletes.

Methods: Experimental study, 30 subjects were randomly allocated into two groups. Group A received Neurobic exercise with Proprioceptive neuromuscular training and Group B received Proprioceptive neuromuscular training alone for six weeks. Both groups were assessed by using outcome measures like Perceived stress scale (PSS), Star excursion balance test (SEBT) and 30-meter sprint test.

Result: Data analysis was done by using paired and unpaired 't' test for within the group and between the group respectively. Statistical analysis done with unpaired 't' test for between the group analysis shown significant improvement in Group A ($P < 0.001$). The result of the study shows that Group A Neurobic exercise with neuromuscular training has more impact in reducing stress and improving balance and sports performance than Group B among young female college athletes.

Conclusion: The study concluded that Neurobic exercises with Proprioceptive neuromuscular training (GROUP A) shows more significant effect on balance, sports performance and stress in young female college athletes after 6 weeks of intervention compared with control group (GROUP B).

Keyword: Neurobic exercise, Proprioceptive neuromuscular training, female athletes, PSS, SEBT and 30-meter sprint test.



A STUDY TO COMPARE THE EFFECTIVENESS OF SPINAL MOBILIZATION WITH ARM MOVEMENT VERSUS NEURAL TISSUE MOBILIZATION ALONG WITH MUSCLE ENERGY TECHNIQUE AMONG CERVICAL RADICULOPATHY PATIENTS

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Background: Cervical Radiculopathy is a disease of the cervical spine and a space occupying lesion that occurs because of pathological problems with cervical nerve roots. It usually causes the pain in the neck, radiating to one arm with reduced motor function and reflex changes in the affected nerve root and commonly affect the middle aged to elderly person.

Objective: A study to compare the effectiveness of spinal mobilization with arm movement versus neural tissue mobilization along with muscle energy technique among cervical radiculopathy patients.

Method: Comparative study, 30 patients were selected from Sri Venkateshwara group of institution. They were allocated into two groups, group A (n=15) spinal mobilization with arm movement along with MET, group B (n= 15) neural tissue mobilization with MET given for 3 days per week for 6 weeks, the outcome measures NPRS and goniometric measurement were used.

Result: Data analysis was done by paired 't' test for within the group and unpaired 't' test for between the group analysis respectively. The statistical analysis shows that the group A had significant improvement than group B. It has been concluded that group A showed reduction in the pain and improvement in ROM than group B.

Conclusion: This study concludes that spinal mobilization with arm movement along with MET for group A shows more significant in reducing the pain and improve ROM among cervical radiculopathy patients than neural tissue mobilization with MET in group B.

Key Words: Spinal mobilization with arm movement, neural tissue mobilization, Muscle energy technique, Cervical radiculopathy, Numerical pain rating scale, Range of motion.