



# SGT UNIVERSITY

Shree Guru Gobind Singh Tricentenary University



## THERA-CONNECT 2K25

International Conference on

**Tradition Meets Innovation:**

**Advancing Health and Well-Being Through Sports Science and Technology**



9:00AM onwards



13<sup>th</sup>-14<sup>th</sup> October, 2025



C Block, Auditorium, SGT University



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Organised by:

**Faculty of Physiotherapy**

SGT University, Gurugram, Delhi NCR, India

### CONFERENCE OBJECTIVES

1. Promote Interdisciplinary Dialogue on Peace in Sports
2. Bridge Tradition and Innovation in sports sciences and technology
3. Showcase Cutting-Edge Research and Applications in the field of sports
4. Encourage Policy and Practice Integration in sports
5. Empower Future Professionals and Innovators in the field of sports
6. Facilitate Networking and Collaboration amongst professionals working for sports
7. Highlight Sustainable and Inclusive Innovations in the world of sports

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SGT University

"I am pleased to know that Faculty of Physiotherapy of SGT University is holding an International Conference "Thera-Connect 2K25" on the theme "Tradition meets Innovation: Advancing Health and Well-being through Sports Science and Technology" on 13th and 14th October 2025.

Thera-Connect 2025 is a celebration of spirit of tradition meeting innovation, of science serving humanity, and of collaboration creating impact. As Chairperson, it gives me immense joy to see this conference fostering inclusivity and global partnerships that echo our belief in holistic education and societal well-being.

What makes this initiative special is its emphasis on not just knowledge exchange, but also cultural pride, sustainable practices, and the empowerment of future generations. Such efforts strengthen India's position in the global sports and health ecosystem while also preserving the essence of our indigenous wisdom. I commend the Faculty of Physiotherapy for their vision and dedication, and I wish all delegates and participants an inspiring and memorable journey at this conference.

I extend my heartfelt best wishes to all the participants for a purpodeful and enriching experience."



**SGT UNIVERSITY**  
Shree Guru Gobind Singh Tricentenary University



**Shri Manmohan Singh Chawla**  
Managing Trustee  
SGT University

I am delighted to learn that Faculty of Physiotherapy of SGT University is holding an International Conference "Thera-Connect 2K25" on the theme "Tradition meets Innovation: Advancing Health and Well-being through Sports Science and Technology" on 13th and 14th October 2025.

At SGT University, we firmly believe that education is not only about imparting knowledge, but also about creating platforms where innovation, values, and societal impact converge. Thera-Connect 2025 is one such initiative that reflects our constant endeavour to nurture minds that can think globally while acting responsibly for the community.

This conference goes beyond academic dialogue; it brings together voices from around the world to collectively reimagine the future of sports and healthcare. I take pride in seeing our institution hosting this confluence of tradition and modernity, and I am certain that the deliberations here will inspire meaningful change for athletes, professionals, and society at large. I extend my heartfelt best wishes to all the participants for a purposeful and enriching experience.



**SGT UNIVERSITY**  
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*Hemant Verma*

**Prof. (Dr.) Hemant Verma**  
Vice Chancellor  
SGT University

"It is truly inspiring to see SGT University host Thera-Connect 2025, a platform that brings together expertise, innovation, and passion in sports science, physiotherapy, and allied health. This conference reflects our commitment to nurturing talent, advancing knowledge, and promoting holistic well-being among athletes and communities alike.

By combining traditional wisdom with modern scientific practices, Thera-Connect 2025 encourages collaboration, sparks new ideas, and paves the way for transformative solutions in health and performance. I extend my warmest wishes to all organizers, speakers, and participants. May this event foster meaningful dialogue, innovative research, and enduring contributions to the fields of sports, healthcare, and allied sciences."



**SGT UNIVERSITY**  
Shree Guru Gobind Singh Tricentenary University



*Atul Nasa*

**Prof. (Dr.) Atul Nasa**  
Pro Vice Chancellor  
SGT University, Gurugram

I am happy to note that the Faculty of Physiotherapy, SGT University, Gurugram is organising an International Conference "**Thera-Connect 2025**" on **13th and 14th October 2025**. "**Thera-Connect 2025 - Tradition Meets Innovation**" is a remarkable initiative that exemplifies SGT University's dedication to advancing knowledge, innovation, and practical solutions in sports science and allied health. By fostering collaboration between researchers, clinicians, and athletes, this conference bridges the gap between theory and practice, tradition and modernity. Such platforms not only enhance professional competencies but also contribute to the well-being and performance of athletes at every level. I commend the organizers for their visionary approach and extend my best wishes to all participants for engaging discussions, fruitful collaborations, and meaningful outcomes that will shape the future of sports and healthcare."

I extend my warm greetings and felicitations to all the delegates and the organisers, and wish the conference a grand success.

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# Role of Physiotherapy in Long COVID Rehabilitation: A Review

ANSH GOYAL<sup>1</sup>, DIVYA<sup>2</sup>, JYOTI YADAV<sup>3</sup>, NK VIDHYA<sup>4</sup>

## ABSTRACT

The COVID-19 pandemic has affected everyone on a large scale, even after recovering from the acute phase of infection number of individuals have experienced symptoms such as fatigue, breathlessness, muscle weakness and reduced exercise tolerance. Commonly referred to as long COVID or post covid syndrome. These symptoms affect physical health as well as Psychological, Social well-being and also it affects day to day living of the individual which highlights the need for a comprehensive rehabilitation strategy. This review aimed to highlight the role of physiotherapy in managing long COVID symptoms and improving quality of life.

The review was conducted by using the search engines PubMed, Google Scholar, CINHAL and Cochrane. Research articles published from 2020 to date in the English language were considered. Presentations, non-peer-reviewed literature and dissertations were excluded.

Based on the evidence, physiotherapy rehabilitation was assumed to reduce symptoms like dyspnoea, improve lung function, improve mobility, increase exercise capacity and promote functional independence in long COVID patients. Also, individualised programmes enhance endurance and muscle strength. Education on pacing and energy conservation minimise post exertional fatigue. Functional outcome measured through 6- min Walk test, Borg dyspnoea scale and fatigue severity scale shows positive results followed by physiotherapy interventions.

Physiotherapy plays a critical role in multidisciplinary Management of Long Covid Rehabilitation programmes. It improves lung function, strength, endurance and overall quality of life. Different rehabilitation programmes, which are designed according to patients' needs, improve the condition of the patient, help in recovery and improve the quality of life.

**Keywords:** Long COVID, Physiotherapy, Recovery, Rehabilitation

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# Balancing the Unbalanced: Decoding Postural Instability and Role of Early Intervention in Adolescents with Intellectual Disabilities: A Narrative Review

ABHILIPSA<sup>1</sup>, BHAVIKA YADAV<sup>2</sup>, SHWETA SHARMA<sup>3</sup>

## ABSTRACT

Adolescents with Intellectual Disabilities (ID) frequently struggle with postural instability, or the inability to maintain balance during either static or dynamic activities. Limitations in adaptive behavior and intellectual functioning that start in the developmental years are what that constitute ID. According to a research article published in year 2020, 1-3% of adolescents worldwide suffer from ID, and research indicates that 40 to 57% of them struggle with balance as a result of issues with motor coordination, sensory integration,

and cognitive processing. These problems reduce independence and general quality of life by raising the risk of falls and associated accidents. This narrative review looked at 17 peer-reviewed publications that were mostly retrieved from PubMed, Google Scholar, Frontiers, Science Direct, and the Wiley Online Library and were published between the year 2013 and 2024. 12 papers were thoroughly examined and included in the following narrative review. Adolescents with mild to moderate ID who were diagnosed and had documented balance impairments between the ages of

10 and 19 are included in this review study. In conclusion, overall the results show that postural instability is a common and complex problem among adolescents with ID. With the help of Physiotherapy interventions that combine multiple approaches particularly balance training have shown promising results in improving postural control.

This review highlights importance of structured, evidence based rehabilitation strategies to reduce fall risk, support mobility, enhance independence and quality of life in this specific population.

**Keywords:** Intellectual disabilities, Sensory Integration, Postural Instability

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Abstract No.: 03

# Wearable Technology in Female Athletes: Monitoring Physiology for Individualised Training and Injury Prevention: A Review

RITIKA KINRA<sup>1</sup>, MANSI DEWAN<sup>2</sup>

## ABSTRACT

Women first competed in the Olympics in Paris in 1900, comprising just 2.2% of athletes. This has grown to 49% in Paris 2024, making the understanding of female-specific performance factors crucial. Sleep, energy expenditure, and menstrual cycle changes significantly influence outcomes, yet individualised monitoring remains a challenge. Wearable devices now enable real-time tracking of these parameters, supporting physiotherapists in optimising recovery, performance, and injury prevention.

To investigate how sleep, energy expenditure, and menstrual cycle variations affect female athletic performance and to explore the role of wearable devices in individualised monitoring for adaptive physiotherapy, injury prevention, and performance optimisation.

A retrospective review, following PRISMA guidelines, analysed studies on the effects of sleep, energy expenditure, and menstrual cycle changes on sports performance and injury risk. Research on wearables, including the Apple Watch, Fitbit, Oura Ring, Whoop, EmbracePlus, and Empatica E4 were assessed for their role in personalised monitoring and adaptive therapy programmes.

Performance and injury risk are strongly influenced by sleep, energy expenditure, and menstrual cycle changes. Each hour of sleep loss raises injury risk by 39%, while low energy availability increases it by 36%. Wearables such as Fitbit and Apple Watch, Oura Ring, which is most reliable for sleep, Whoop for energy expenditure and Empatica E4 and Embrace Plus, which monitors menstrual cycle parameters, enable real-time tracking of body temperature, heart rate, heart rate variability, and electrodermal activity. This data guides training: strength and skill work in the follicular phase, peak power during ovulation, endurance and recovery in the luteal phase, and low-intensity focus during menstruation.

Evidence supports wearable technology for real-time physiological monitoring, enabling individualised and preventive physical therapy. By adapting training and rehabilitation to sleep, energy, and menstrual cycle variations, physiotherapists can enhance performance, reduce injury risk, and support athletes' long-term health.

**Keywords:** Energy expenditure, Menstrual Cycle, Sleep, Physical therapy, Wearable devices

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# Comprehensive Paediatric Assessment and Rehabilitation of Spastic Cerebral Palsy with Global Developmental Delay Using the ICF Framework: A Case Study

DISHA GUPTA<sup>1</sup>, HARSHITA<sup>2</sup>, HIMANSHU GAKHAR<sup>3</sup>, POOJA ANAND<sup>4</sup>

## ABSTRACT

This case report addresses the physiotherapeutic management of a 3-year old boy with spastic cerebral palsy along with global developmental delay, a neurological deficit. The patient presented with a two-year history of developmental delay and progressive musculoskeletal and neurological decline, including muscle spasticity, speech disorders and coordination issues. Cerebral palsy primarily impacts development and growth, which significantly affects the patient's functional independence.

A comprehensive rehabilitation programme was designed to improve the patient's coordination, mobility and overall functional abilities. The primary goal was to improve the condition by addressing key issues such as strength, gait and coordination.

A tailored rehabilitation program was developed, incorporating the ICF framework, which involved weight-bearing and mat activities,

stretching, strengthening, gripping exercises, and hippotherapy. He was also referred for speech and occupational therapy. These interventions were designed to target the patient's specific deficits related to cerebral palsy. Regular assessment ensured adjustments to the therapy, optimising the treatment procedure.

Following the rehabilitation programme, the patient demonstrated significant improvement in coordination and mobility. There was a noticeable reduction in cerebral palsy symptoms, including improved coordination and reduced spasticity.

The application of the ICF framework combined with exercises may offer a promising approach for managing cerebral palsy symptoms. Further research is required to validate these findings and optimise treatment protocols.

**Keywords:** International Classification of Functioning, Disability and Health (ICF), Neurorehabilitation, Spasticity

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# Sex-specific Association of Sleep Quality with Cardiovascular Markers in Young Adults: A Pilot Study

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**Introduction:** Sleep quality affects cardiovascular, mental, and reproductive health. However, we know little about the specific factors influencing young adults based on sex. Aim: This pilot study aimed to look at the connections between sleep quality and cardiovascular markers in young adults, focusing on differences between males and females.

**Materials and Methods:** The cross-sectional comparative study included a total of 30 participants and divided the sample into two groups (15 male and 15 female) based on inclusion and exclusion criteria. The study was conducted at the faculty of physiotherapy, S.G.T.U., after receiving informed consent. Standardised blood pressure using the JNC-7 protocol and short-term heart rate

variability with a 5-minute recording according to the international Heart Rate Variability (HRV) guidelines were measured. Sleep quality, physical activity, and perceived stress with Pittsburgh Sleep Quality Index (PSQI), International Physical Activity Questionnaire (IPAQ), and Perceived Stress Questionnaire (PSQ), respectively, were assessed. Results: Data were collected in a controlled environment with consistent participant preparation. The obtained physiological and questionnaire data were scored, analysed, and compared across groups to explore differences in cardiovascular and psychosocial parameters. The study explored associations between sleep indices and cardiovascular parameters using Pearson or Spearman

correlation as appropriate. We conducted statistical analyses in SPSS (version 26), setting significance at  $p < 0.05$ .

**Conclusion:** In this pilot sample, sleep disturbances were more significant in females, likely due to hormonal, psychosocial, and circadian factors. These findings support the need for larger studies that consider sex differences and targeted efforts to improve sleep and cardiovascular health in young adults.

**Keywords:** Cardiovascular health, Pittsburgh Sleep Quality Index, Sleep disturbance

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Abstract No.: 06

# Athlete-Centred Digital Innovation in Sports Injury Management

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## ABSTRACT

The sports sector has witnessed a rapid technological transformation, influencing training, performance, and injury management. Digital tools are increasingly integrated to assess physical demands, support rehabilitation, and enhance overall athletic well-being. This study explores the contribution of digital innovations from 2010 to 2023, highlighting their role as key drivers in reshaping athlete care.

This review aimed to apply athlete-centred digital innovations for performance enhancement, injury prevention and detection, personalised rehabilitation, psychological support, inclusivity, data-driven decision making, and athlete empowerment.

A focused literature review was conducted through Google Scholar and PubMed using keywords such as “wearable sensors” and “biometric tracking.” Ten peer-reviewed studies published between 2010 and 2023 were analysed to examine recent advancements in digital tools relevant to sports injury management.

Wearable devices, biometric monitoring, and motion-tracking technologies are central to athlete-centred digital health. These tools enable continuous monitoring, optimise training regimens, and contribute to early injury detection. Evidence indicates that integrating digital health with sports science improves performance outcomes, supports recovery, and enhances rehabilitation strategies. Innovations such as virtual reality, social media platforms, and online performance tracking provide additional dimensions of support by addressing psychological health, engagement, and accessibility.

Digital innovations are redefining approaches to sports injury management and athlete performance. Research highlights their capacity to provide objective measurements, refine training techniques, and promote inclusivity. Athlete-centred applications of these technologies empower individuals, improve recovery processes, and enable data-informed decisions, underscoring their growing significance in modern sports science and healthcare.

**Keywords:** Biometric tracking, Digitalisation, Virtual coaching, Wearable sensors

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# Optimising 100-Meter Sprint Performance through Blood Flow Restriction Training: A Review

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## ABSTRACT

The 100 m sprint demands exceptional explosive strength, power generation, and rapid recovery. Conventional high-load resistance training ( $\geq 80\%$  1RM) has long been the cornerstone of sprint preparation, but often leads to increased fatigue and musculoskeletal strain. Emerging evidence suggests that Blood Flow Restriction (BFR) training, which combines low-intensity resistance exercise (20-30% 1RM) with controlled vascular occlusion, can elicit comparable hypertrophic and strength adaptations to high-load training while minimising joint stress.

This literature review explores the efficacy of low-intensity BFR training as a supplementary modality for improving power output, muscle hypertrophy, and recovery in elite 100 m sprinters.

A comprehensive review of peer-reviewed literature from databases including PubMed, Scopus, and Web of Science was conducted. Studies investigating low-load BFR training and its effects on muscular adaptations, performance metrics, and recovery parameters in athletic populations were analysed. Key findings were synthesised to assess the potential transferability of BFR protocols to sprint-specific training contexts.

Evidence consistently demonstrates that BFR training induces significant increases in muscle cross-sectional area and strength comparable to high-intensity protocols (Slysz et al., 2016; Patterson et al., 2019). Furthermore, neuromuscular adaptations and enhanced fast-twitch fibre recruitment under hypoxic stress has been reported, suggesting potential benefits for sprint performance. BFR has also been associated with reduced perceived muscle soreness and faster recovery, likely due to lower mechanical strain and metabolic stress-mediated hormonal responses. Limited but promising data indicate improvements in sprint-specific power outputs, such as vertical jump height and short-distance acceleration.

Low-intensity BFR training offers a novel, evidence-based adjunct to traditional resistance programs for 100 m sprinters. By promoting hypertrophy and strength adaptations while minimising fatigue, BFR can optimise both in-season performance maintenance and rehabilitation strategies. Future longitudinal studies should investigate the direct impact on sprint times, optimal cuff pressures, and individualised application protocols for elite and youth athletes.

**Keywords:** Low-load training, Muscle hypertrophy, Power development, Recovery

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# Tele-physiotherapy: A Sustainable and Innovative Model Redefining Patient-Centred Rehabilitation

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## ABSTRACT

Tele-physiotherapy, defined as the delivery of physiotherapy services through digital communication technologies, has emerged as a transformative solution in modern healthcare. Traditional physiotherapy has relied on in-person assessments and interventions, restricting availability for individuals in distant regions facing movement challenges or during global crises such as the COVID-19 pandemic. With the global rise in chronic diseases and the rapid digital transformation of health services, tele-physiotherapy emerges as a scalable and timely response to the growing demand

for accessible, affordable, and patient-centered rehabilitation across diverse healthcare settings.

This review aims to explore how tele-physiotherapy addresses these barriers by enabling remote assessments, supervised exercise programs, patient education, and tracking improvement. It also examines its clinical efficacy and factors for integration into routine healthcare.

This narrative review synthesises recent evidence on tele-physiotherapy and examines advancements in telecommunication and portable digital devices. These innovations support features,

including immediate responses from users, individualised exercise programmes, and interactive patient engagement tools.

Findings from published studies suggest that telephysiotherapy provides clinical outcomes comparable to conventional in-person therapy for physical activity for those with muscle, nerve, or long-term health issues. Patients report greater adherence, satisfaction, and self-management, while healthcare systems benefit from reduced costs and resource utilisation. Telephysiotherapy further improves accessibility in rural or underserved regions, ensures continuity of care after surgery or in chronic conditions, and supports service delivery during public health emergencies. Challenges include patient selection, digital literacy, and ethical concerns such as data privacy.

Tele-physiotherapy represents a sustainable, scalable, and innovative model of rehabilitation that extends beyond crisis-driven solutions. By enhancing accessibility, engagement, and quality of care, it is well-positioned to redefine patient-centred physiotherapy. Its successful integration into mainstream practice requires thoughtful strategies to address technological and moral aspects; upcoming studies need to focus on extended results, cultural adaptability, plus creating uniform guidelines to maximise its global acceptance and effectiveness.

**Keywords:** Delivery of healthcare, Health services accessibility, Remote patient monitoring, Tele-rehabilitation

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Abstract No.: 09

# Musculoskeletal Disorder in Esports Players: A Scoping Review of Prevalence, Risk Factors and Interventions

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## ABSTRACT

Esports is a rapidly growing sport that has made gaming a physically demanding task that requires prolonged sitting, repetitive hand movements and static posture. These aspects put players at risk of Musculoskeletal Disorders (MSDs) like overuse injuries in occupational and athletic groups. Despite this growth, musculoskeletal health awareness is still low.

The purpose of this scoping review is to examine the prevalence, risk factors, and intervention of musculoskeletal disorders in Esports players.

Following the Population, Concept, Context (PCC) framework, this review targets Esports players in the age group of 16-30 years that indulge in competitive, semi-competitive and recreational gaming conditions with prolonged sessions with sustained postures and repetitive hand use on platforms like PC, console and mobile gaming duration between 4 and 12 hours per day. It deals with

MSDs such as neck and shoulder pain, low back strain, carpal tunnel syndrome and De Quervain's tenosynovitis. Most of the studies were cross-sectional surveys taken from PubMed, Scopus, Science Direct, PEDro and Cochrane (CENTRAL) using the keywords: Esports, Musculoskeletal disorders, Repetitive Strain injuries and Physiotherapy interventions, starting from December 2020 to December 2025.

The prevalence rates of MSDs were between 55% and 75%, with the neck, shoulders, wrist and lower back being the most affected. Risk factors that were reported were repetitive movements, poor ergonomics and low physical fitness.

The MSDs are very common in Esports. Preventative steps like posture correction, periodic breaks and strengthening programmes appear promising but are not empirically proven.

**Keywords:** Ergonomic risk factors, Esports athletes, Musculoskeletal disorders, Physiotherapy interventions, Repetitive strain injuries

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# Future Horizons of Digital Transformation in Sports: A Narrative Review

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## ABSTRACT

Sports digital transformation has evolved through artificial intelligence, wearable technology, virtual reality, and big data analysis. These technologies enhance the performance of athletes as well as the fans, governance, and sustainability. Future perspectives indicate the intersection of innovation with sustainability, inclusion, and economic development, suggesting that digital transformation is an area worth further investigation.

A narrative review was conducted, synthesising literature related to sports innovation, sustainability frameworks, governance models, and policy formulation. International case studies, systematic reviews, and insights from major publications like Global Perspectives of Sustainability in Sports Organisations were utilised. A comparative analysis was employed to examine current innovations and developing strategies.

Wearable tech, AI analytics, and immersive platforms became the focus of training and performance enhancement. Digital transformation also supports sustainability through lowered resource consumption, inclusive remote engagement, and new economic prospects. Data privacy and fair access concerns persist, while more organisations anchor digital strategies in the UN Sustainable Development Goals.

Sports ecosystems in the future will be joined by smart infrastructure, blockchain transparency, and AI-driven decision-making. In addition to performance, digital transformation will promote sustainability, governance, and social development. Strong policies and equitable access will be essential to unlocking its full world potential.

**Keywords:** Artificial Intelligence, Policy and governance models, Sustainability in sports, Wearable technology

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# Linking Attention Span and Role of Early Intervention in Children with Intellectual Disabilities: A Narrative Review

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## ABSTRACT

Intellectual Disability (ID) is a condition in which children face difficulties in learning new concepts as well as managing their daily routines. According to a research study in 2022, the prevalence rate of 2% children with intellectual disabilities was reported in India. One of the major issues of children with ID is difficulty staying attentive. Attention span, the ability to focus on a task, is usually lower in these children and this affects learning, social interaction and independence in daily life. This review study was done to explore the role of attention span on the overall functioning of children with ID and highlights the need for early detection and focused interventions. This review

utilised PubMed, Google Scholar and Cochrane were used to collect the relevant literature. A total of 17 studies published in 2015-2025 were looked at and 10 were selected after screening and removing duplicates. These were cross-sectional, observational, meta-analytic and narrative review studies. The study indicates that the attention span of children with ID is always shorter than that of typically developing children and severely restricts the performance in school and everyday activities. Meanwhile, research study also indicate that structured training programmes, music therapy, phonological therapy and pictorial supports can be used to reinforce attention and achieve more independence. In general, this review highlights the critical role

of attention span as a primary outcome of intervention in children with ID because the improvement of this domain can have a significant impact on learning and quality of life.

**Keywords:** Adaptive skills, Attention span, Intellectual disability, Learning difficulties.

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Abstract No.: 12

# Application of Pune Shoulder Rehabilitation Programme in Treating Scapular Dyskinesia: A Case Study

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## ABSTRACT

Scapular dyskinesia refers to abnormal static positioning and dynamic motion of the scapula, often resulting from altered bony stabilisers and impaired muscle activation patterns. These changes disrupt the scapulo-humeral rhythm, leading to functional limitations and shoulder dysfunction. The muscular system, including the pectoralis minor, rhomboids, trapezius and serratus anterior, plays a vital role in maintaining optimal scapular motion and positioning.

This case study aims to evaluate the effectiveness of Pune Shoulder Rehabilitation Program (PSRP) in improving scapular alignment, shoulder mechanics and function in an individual with scapular dyskinesia.

A 27-year-old male presented with asymmetric shoulder mechanics— anterior translation of the right and posterior translation of the left shoulder during gait. Symptoms began in 2018, after intense shoulder exercises and gradually worsened.

Physiotherapy assessment confirmed type II scapular dyskinesia based on Kibler's classification, with an altered scapulo-humeral rhythm and weakness in scapular stabilisers. Assessments included static scapular positioning (acromion-to-wall distance, scapular medial border to T4 spinous process), pectoralis minor length, and MMT-based muscle strength, muscle tightness and shoulder angle analysis via Kinovea software. An 8-week PSRP protocol, administered 5 days/week, emphasised scapular stabilisation, strengthening, postural correction and symmetrical alignment restoration.

By the 6th week, notable improvements were observed in acromion and scapular border measurements and pectoralis minor length. By 8th week, shoulder angles and muscle strength showed marked improvement. PSRP effectively improved scapular alignment, muscle strength and shoulder function in a case of scapular dyskinesia.

**Keywords:** Kibler Classification, Scapular kinematics, Scapulohumeral rhythm

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# Beyond the Game: Micro-Traumas and Their Effect on Hand Health in Esports Athletes

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## ABSTRACT

**Introduction:** Esports refers to video games in which teams or individuals compete against each other. It is considered a sporting activity in which players can develop and train their mental skills and handcoordination while playing. India is currently ranked fifth among the list of top countries by game downloads globally. This makes a subset of the population of India extremely vulnerable to the harms associated with excessive digital gaming. Need for this study: The increasing popularity of esports has raised concerns about its impact on musculoskeletal health. Apart from neck, back muscles, and poor posture, arguably, the most essential parts of a gamer's body are their hands.

**Aim:** The objective of the study is to analyse the muscle activity pattern of wrist flexors, extensors, and thenar muscles using Electromyography (EMG) and to evaluate alterations in hand functioning before and after a prolonged gaming session.

**Materials and Methods:** In the study, 3 separate groups with 10

male participants each, aged 16 to 30 years, will be taken, who will perform different categories of gameplay (MOBA, FPS, SANDBOX). For assessing the grip strength, a hand-held dynamometer and for pinch strength, a pinch gauge will be used. For endurance and speed, the finger tapping test will be used before and after 30 minutes of the match, EMG will be recorded during the gameplay continuously, with electrode placement on the Flexor Carpi Radialis and Extensor carpi Radialis. In Esports, it is generally made to be related to backache, postural changes, neck pain, but the minor changes happening in the wrist are often ignored. These microtraumas do not give any early symptoms, but collectively give difficulty to the individual later in life.

**Conclusion:** Thus, after assessing these parameters, this study will give evidence on the differences in hand functioning, which can be further prevented or corrected to improve the quality of life.

**Keywords:** Esports prevalence, Hand functioning Esports, Wrist alterations, Wrist Esports

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# Effects of ACSM-Recommended Exercise Interventions on Aerobic Capacity in Patients with Stage-2 Hypertension: A Systematic Review

ADITI JAIN<sup>1</sup>, BHUMIKA CHHIBBER<sup>2</sup>

## ABSTRACT

**Introduction:** Hypertension remains a major global public health concern, contributing significantly to cardiovascular diseases. While pharmacological therapy is fundamental for blood pressure control, exercise-based interventions have emerged as a crucial non-pharmacological strategy to enhance the cardiovascular function and overall health outcomes. The American College of Sports Medicine (ACSM) provides comprehensive, evidence-based guidelines that advocate for regular moderate to vigorous intensity aerobic activities, such as brisk walking, cycling, or swimming, performed on most days of the week to achieve optimal blood pressure regulation and

cardiovascular benefits. This systematic review aims to critically study the efficacy of the ACSM-recommended aerobic training protocols in patients with Stage-2 hypertension, with particular emphasis on their impact on aerobic capacity as measured by maximal oxygen uptake (VO<sub>2</sub> max) and the Six-Minute Walk Test (6MWT). By synthesising findings from recent clinical trials and exercise interventions, this review seeks to provide an evidence-based understanding of how structured aerobic exercise, aligned with ACSM-based guidelines contribute to improved cardiovascular fitness and functional capacity in hypertensive populations.

**Aim:** This systematic review aims to analyse the effects of ACSM-recommended exercise interventions on aerobic capacity in patients with stage-2 hypertension. The study specifically focuses on the change in aerobic capacity, as quantified by measures such as VO<sub>2</sub> max and the 6MWT.

**Materials and Methods:** A systematic review was conducted across PubMed, Scopus, ScienceDirect, Google Scholar for research articles published from 2013 to 2024. This systematic review includes 18 clinical trials and longitudinal cohort studies that assessed the effects of ACSM-based aerobic therapies on aerobic capacity in stage-2 hypertensive patients, analysing the intervention parameters and outcomes.

**Results:** Most trials in this systematic review reported significant improvements in aerobic capacity among stage 2 hypertension patients following ACSM-based exercise protocols. On average, VO<sub>2</sub> max increased by 10-18%, with aerobic training performed 3-5 times per week for 30-60 minutes, yielding the most consistent gains. These interventions also improved 6MWT performance and

reduced resting blood pressure, reflecting enhanced cardiovascular efficiency. Additionally, supervised High-Intensity Interval Training (HIIT) programmes produced comparable or even greater improvements in aerobic capacity, emphasising the adaptability and effectiveness of ACSM-guided exercise prescriptions for hypertensive individuals.

**Conclusion:** Aerobic training based on ACSM guidelines significantly enhances aerobic capacity in individuals with stage-2 hypertension, contributing to improved cardiovascular health and a more favorable prognosis, as reflected by increased VO<sub>2</sub> max and endurance levels. Achieving optimal outcomes depends on an individualised programme design, consistent participation, and sustained adherence. Future research should emphasise the standardised implementation of ACSM principles and investigate long-term adherence and outcomes within this population.

**Keywords:** ACSM-Based Guidelines, Cardiovascular health, Six-minute walk test

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Abstract No.: 15

# Association between Anthropometric Measurements and Fatigue, Stress, Anxiety, and Depression among Female Collegiate Students with Polycystic Ovarian Disease: A Cross-Sectional Study

KHUSHI RAJ<sup>1</sup>, PRINCE KUMAR<sup>2</sup>, GARIMA LAKRA<sup>3</sup>, LALLI SINGH<sup>4</sup>

## ABSTRACT

**Introduction:** Polycystic ovarian disease is among the most prevalent hormonal illnesses in young collegiate females. Aside from menstrual and reproductive problems, it is associated with weight gain, insulin resistance, and mental illness. Fatigue, stress, anxiety, and depression are common among women with polycystic ovarian disease, affecting their daily activity and academic performance. Anthropometric indicators, including body mass index, waist-hip ratio, and waist-to-height ratio, are easy but informative measures with which to examine the relationship between body composition and physical and psychological well-being.

**Aim:** This study examines the relationship between anthropometric measurements and fatigue, stress, anxiety, and depression in young collegiate females diagnosed with polycystic ovarian disease.

**Materials and Methods:** A cross-sectional correlational study will be carried out among 40 female students aged 18-25 years, who

were clinically diagnosed with polycystic ovarian disease for more than one year. The participants will be chosen by convenience sampling. Anthropometric data will be obtained in conjunction with validated questionnaires-the Fatigue Severity Scale (FSS) and Depression, Anxiety, and Stress Scale (DASS-21). Students with illnesses like thyroid conditions/diabetes or on drugs that influence their weight or cognition will be excluded.

**Results:** We expect that a higher BMI and central adiposity will correlate positively with increased fatigue, stress, anxiety, and depression scores.

**Conclusion:** By linking body composition with psychological well-being, this study aims to understand how polycystic ovarian disease affects young collegiate females, to promote early lifestyle changes and mental health support designed for this vulnerable group.

**Keywords:** Anthropometry, Body mass index, Waist-hip ratio

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# Association between Forward Head Posture and Impaired Sleep Quality in OTT Users: A Cross-Sectional Study

TAMANNA<sup>1</sup>, ANANT TYAGI<sup>2</sup>, HIMANSHU GAKHAR<sup>3</sup>**ABSTRACT**

**Introduction:** The growing popularity of Over-The-Top (OTT) media platforms has led to increased screen time, often accompanied by poor sitting postures, particularly Forward Head Posture (FHP). This postural issue may contribute to physical discomfort and disturbances in sleep. Aim: The present study aims to explore the relationship between FHP and sleep quality in regular OTT users.

**Materials and Methods:** A cross-sectional study was conducted among 200 individuals aged 18-35 years who reported daily OTT usage. FHP was evaluated by measuring the Craniovertebral Angle (CVA) through lateral photographs. Sleep quality was assessed using the standardised Pittsburgh Sleep Quality Index (PSQI). Data were analysed using correlation and regression methods to determine the association between FHP and sleep quality.

**Result:** Our data revealed that the majority of the OTT users belongs to the 24-29 years age group (36%, followed by 30-34 years (28%), 18-23 years (21%), and 35-40 years (15%). This concentration of the

younger age group as major OTT consumers proved that students and young adults are predominantly engaged with OTT platforms like Amazon Prime, Hotstar, and YouTube. The correlation analysis of this study revealed a weak and positive correlation between PSQI score and OTT usage ( $r=0.18$ ). The relationship between OTT usage and CVA was very weak and Negative ( $r=-0.06$ ).

**Conclusion:** This study found a significant prevalence of FHP and neck pain among people who spend prolonged time watching OTT content, especially those using poor postures on small devices. The research suggests this leads to musculoskeletal issues, and the resulting pain and discomfort is associated with poor sleep quality and disrupted circadian rhythms. It highlights the need for awareness about postural correction and healthy screen-time habits in young adults, and for healthcare professionals to include postural/sleep screening in their practice.

**Keywords:** Craniovertebral angle, Forward sleep quality, Over-The-Top platforms, Posture-related sleep disturbance

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# Investigating Clinical Outcomes of Physiotherapeutic Intervention in Shoulder Impingement Syndrome: A Case Series

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## ABSTRACT

Shoulder Impingement Syndrome (SIS) is a common cause of pain and dysfunction in the shoulder in the active young adult population who participate in overhead activities, primarily resulting from compression of subacromial structures and rotator cuff pathology. It includes two main pathologies: subacromial impingement and internal impingement. This case series aimed to investigate the effectiveness of physiotherapy interventions, including functional rehabilitation and agility exercises to improve pain, range of motion and functional outcomes in patients with SIS. Five patients (aged 30-45 years old) with SIS were included. For confirmation of the SIS, Neer's impingement test and Hawkins- Kennedy test were applied. Other tests, such as the painful arc syndrome test, drop arm test, and internal rotation strength test was applied for differential diagnosis. The shoulder range of motion by the Goniometer, functional outcome measures by Disability of Arm, Shoulder and Hand (DASH) questionnaire, Shoulder Pain and Disability Index (SPADI), and pain

intensity using the Visual Analogue Scale (VAS) before and 6 weeks after the treatment were assessed. Results revealed a significant improvement observed in all outcome measures ( $p < 0.05$ ). The pre- and postintervention values (mean $\pm$ SD) were VAS (6.60 $\pm$ 1.140 to 2.00 $\pm$ 0.707), SPADI (65.80 $\pm$ 7.190 to 17.80 $\pm$ 2.280), DASH (61.80 $\pm$ 6.017 to 21.40 $\pm$ 2.608), flexion range (87.80 $\pm$ 10.25° to 167.00 $\pm$ 9.434°), extension range (29.60 $\pm$ 3.209° to 52.20 $\pm$ 6.058°), external rotation range (24.80 $\pm$ 6.380° to 57.60 $\pm$ 8.325°), and abduction range (65.00 $\pm$ 15.811° to 136.00 $\pm$ 19.812°). These results suggest that a structured physiotherapy programme incorporating special test-guided assessment, agility training, and functional exercises are effective in reducing pain, improving shoulder function, and enhancing the Range of Motion (ROM) in individuals with SIS, thereby facilitating a safe return to daily and overhead activities.

**Keywords:** Agility training, Functional rehabilitation, Special tests, Sports-specific drills

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# Respiratory Muscle Training and Shoulder Conditioning for Optimising Ventilatory and Functional Performance in Young Cadets: A Narrative Review

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## ABSTRACT

Optimal ventilatory function and functional performance are crucial for National Cadet Corps (NCC) cadets to meet physical training demands. Respiratory Muscle Training (RMT) using devices like the AeroFit trainer and shoulder flexibility and strengthening exercises have individually shown benefits in enhancing pulmonary function

and musculoskeletal performance. However, limited research exists on their combined effects in cadet populations. This narrative review synthesised existing literature on RMT and shoulder conditioning interventions in young adults, athletes, and military personnel. Databases including PubMed, PMC, and Google Scholar were searched using keywords: "AeroFit respiratory trainer," "respiratory

muscle training,” “shoulder flexibility,” “strengthening exercises,” “ventilatory function,” and “functional performance.” Studies assessing pulmonary outcomes (FEV, FVC, inspiratory muscle strength) and functional performance measures (6-minute walk test, endurance tests) were included. Evidence gaps and potential synergistic mechanisms were identified. RMT significantly improves inspiratory muscle strength and exercise capacity. Shoulder flexibility and strengthening exercises enhance thoracic mobility, posture, and accessory respiratory muscle recruitment. Limited studies explored combined interventions, but evidence suggests a potential synergistic effect on ventilatory efficiency and functional

endurance. Cadet-specific research is sparse, highlighting the need for randomised controlled trials in this population. Integrating aerofit respiratory training with shoulder flexibility and strengthening exercises may offer a promising approach to improve both ventilatory function and functional performance in NCC cadets. This review identifies a clear research gap and provides a rationale for conducting RCTs to determine efficacy and implementation strategies in cadet training programs.

**Keywords:** Aerofit respiratory trainer, Functional performance, Shoulder exercises, Ventilatory function

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# Effect of Diaphragmatic Breathing vs Mindful Breathing Practice on Attention Span, Reaction Time and Short-Term Memory in University Students: A Study Protocol

PRIYANSHI<sup>1</sup>, SHEETAL KIROULA<sup>2</sup>, ANTRIKSH<sup>3</sup>, ANKITA<sup>4</sup>

## ABSTRACT

**Introduction:** It is well acknowledged that breathing exercises are simple ways to improve cognitive abilities. The mindful breathing enhances executive functioning and attention control and diaphragmatic breathing promotes parasympathetic activation and stress reduction.

**Need for this Study:** There is, however, no data that explicitly compares how well they perform on important cognitive domains among college students.

**Aim:** The purpose of this study is to evaluate the effects of mindful breathing versus diaphragmatic breathing in university students short-term memory, attention span, and reaction time.

**Material and Methods:** At SGT University, a comparative experimental design will be carried out among healthy students

between the ages of 15 and 25 years. Participants will be randomly allocated into two groups: Diaphragmatic breathing and mindful breathing. Each group will undergo a 10-minute guided session of their assigned breathing technique. Cognitive performance will be assessed pre- and post-intervention using standardised tools: Digit Span Test (for attention and short-term memory), Ruler Drop Test (for reaction time), and the Mindful Attention Awareness Scale. Data will be analysed to compare within-group and between-group changes.

**Results:** The result will be declared on the day of the paper presentation, and the work is still in progress.

**Keywords:** Breathing exercises, Digit span test, Parasympathetic activation

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# Virtual Reality Therapy for Motor, Balance, and Cognitive Outcomes in Neurological Disorders: A Systematic Review

POOJA RANI<sup>1</sup>, APARNA BARARIA<sup>2</sup>, JASHANDEEP KAUR<sup>3</sup>

## ABSTRACT

**Introduction:** Virtual reality therapy (VRT) has emerged as an innovative approach in neurorehabilitation, offering immersive and engaging environments that enhance engagement, motivation and functional recovery. Neurological disorders such as stroke, Parkinson's disease, Multiple Sclerosis (MS), Cerebral Palsy (CP), and Traumatic Brain Injury (TBI) result in severe motor, cognitive, and functional impairments. Conventional physiotherapy is effective but often limited by patient adherence and lack of task-specific training, VRT easily overcomes these challenges through the gamification of the rehabilitation protocols.

**Aim:** This systematic review of randomised controlled trials evaluating the effects of VRT across major neurological conditions, focussing on functional, motor, balance, cognitive, and quality-of-life outcomes.

**Materials and Methods:** A systematic review of randomised controlled trials published between 2021 and 2024 was performed. Twenty eligible trials with PEDro scores ranging from 5 to 7 were included. The studies enrolled diverse populations, from children with cerebral palsy to adults with stroke, Parkinson's disease, MS and TBI. VRT platforms included Adapt Rehab VR, PRISMA, Oculus, Unity, and EPIC, with interventions ranging from 4 to 12

weeks. Outcomes assessed included upper and lower limb motor recovery, balance, gait speed, cognitive function, swallowing, and activities of daily living.

**Results:** In stroke populations, VRT improved upper limb motor scores, gait speed, balance, independence, and recovery from neglect and dysphagia. Parkinson's trials demonstrated enhanced gait, reduced freezing of gait, and improved Unified Parkinson's Disease Rating Scale (UPDRS) and balance confidence. MS patients benefited from VR exergaming with reduced fatigue, better balance, and cognitive gains. Paediatric CP trials showed significant improvements in gross motor function and upper limb active range of motion. In TBI, VR cognitive rehabilitation improved attention and memory performance. Across conditions, VRT was consistently safe and well-tolerated, with outcomes superior or comparable to conventional therapy.

**Conclusion:** Evidence from randomised controlled trials supports VRT as an effective, engaging, and feasible adjunct to conventional rehabilitation in neurological disorders. Benefits span motor, balance, cognitive, and functional domains, although long-term efficacy and standardised protocols require further study.

**Keywords:** Cerebral palsy, Multiple sclerosis, Parkinson's disease, Stroke rehabilitation

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# Laser and Regenerative Therapies for Striae Distensae and Striae Alba: A Systematic Review of Comparative Efficacy

SHAGANDEEP SINGH<sup>1</sup>, APARNA BARARIA<sup>2</sup>

## ABSTRACT

**Introduction:** Striae distensae and striae alba are common dermatological conditions with significant cosmetic and psychosocial impact. Despite multiple treatment approaches including lasers, light therapies, microneedling, and regenerative techniques, a consensus on the most effective modality remains unclear. Advances in laser technology and adjunctive regenerative treatments such as platelet-rich plasma and stem cell-derived products have prompted numerous clinical trials to evaluate comparative efficacy.

**Aim:** This review aimed to synthesise evidence from randomised controlled studies evaluating various therapeutic modalities for striae management and to identify the most promising interventions.

**Materials and Methods:** A systematic review of randomised controlled trials and comparative clinical studies published between 2012 and 2025 were performed. Databases including PubMed, Google Scholar and NCBI were searched using keywords related to striae treatment and lasers, light therapy, or regenerative approaches. Eight eligible studies with PEDro scores ranging from 5 to 8 were included, assessing modalities such as Poly-L-Lactic Acid (PLLA), Er: YAG, diode and Nd: YAG lasers, fractional CO<sub>2</sub>, Intense Pulsed Light (IPL), microneedling, and regenerative adjuncts, including

Stromal Vascular Fraction (SVF), Platelet Rich Plasma (PRP) and Mesenchymal Stem Cell (MSC)-conditioned medium.

**Results:** PLLA and its combination with NAFL demonstrated superior outcomes compared to laser monotherapy. Er: YAG combined with SVF yielded the best improvement compared to PRP or saline. Diode LLLT showed comparable results to fractional CO<sub>2</sub> with mixed outcomes when combined. Long-pulsed Nd: YAG was slightly superior to fractional CO<sub>2</sub>. Nd: YAP and fractional CO<sub>2</sub> lasers consistently produced significant improvement and safety. Fractional CO<sub>2</sub> was superior to topical tretinoin. Microneedling with MSC-conditioned medium significantly outperformed the control.

**Conclusion:** Evidence suggests that laser-based therapies, particularly fractional CO<sub>2</sub>, Nd:YAG, and Nd:YAP, provide significant clinical improvement in striae, with enhanced outcomes when combined with regenerative adjuncts such as PLLA, SVF, or MSC-conditioned medium. While these interventions are generally safe and effective, further standardised, large-scale trials are warranted to establish optimal protocols and long-term outcomes.

**Keywords:** Fractional CO<sub>2</sub> laser, Nd:YAG, Poly-L-Lactic acid, Regenerative therapy

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# Novel Therapeutic Approaches for Spinal Cord Injury: A Systematic Review

RITU RAJ<sup>1</sup>, APARNA BARARIA<sup>2</sup>

## ABSTRACT

**Introduction:** Spinal Cord Injury (SCI) results in profound motor, sensory, and autonomic impairments that limit independence and quality of life. Conventional rehabilitation approaches provide partial recovery but often fail to optimise cardiovascular health,

ambulation, and psychosocial outcomes. Recent advances in exercise, neuromodulation, exoskeleton robotics, and hybrid Functional Electrical Stimulation (FES) has expanded opportunities for functional recovery.

**Aim:** This systematic review aimed to synthesise evidence from

randomised controlled trials and related protocols investigating rehabilitation interventions in adults with acute, subacute, and chronic SCI, highlighting their efficacy across motor, cardiovascular, and quality-of-life domains.

**Materials and Methods:** A systematic review of Randomised Controlled Trials (RCTs) and pilot studies published between 2021 and 2024 were conducted. Databases, including PubMed and Google Scholar, were searched using terms related to SCI rehabilitation, locomotor training, FES, exoskeletons, neuromodulation, and virtual exercise. Twenty relevant studies were included, with sample sizes ranging from pilot cohorts to multi-site trials, and interventions including hybrid FES rowing, Trans-spinal Stimulation (TSS), exoskeleton-assisted walking, progressive resistance training, blood flow restriction exercise, and virtual or tele-exercise programmes.

**Results:** Hybrid FES interventions improved cardiovascular parameters and body composition, although neurological recovery remained limited in some trials. TSS combined with locomotor training enhanced walking independence and plasticity compared

to sham. Exoskeleton training consistently improved ambulatory outcomes, especially in incomplete and subacute SCI, with metaanalysis confirming greater benefit in patients less than six months post-injury. Progressive resistance training with FES increased strength and muscle volume, while blood flow restriction promoted hypertrophy without major strength gains. Virtual and tele-exercise programmes demonstrated feasibility and improved activity levels. Behavioural care models reduced pain, depression, and improved quality of life.

**Conclusion:** Rehabilitation strategies combining advanced technologies such as FES, TSS, and exoskeleton robotics with conventional therapy significantly enhance functional outcomes and cardiometabolic health in SCI. While feasibility is established, large-scale standardised trials are required to optimise protocols and tailor interventions to injury stage and severity.

**Keywords:** Exoskeleton training, Functional electrical stimulation, Rehabilitation, Transspinal stimulation

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# A Literature Review on Transcutaneous Electrical Nerve Stimulation: A Non-Pharmacological Option for Labour Pain Management

BRAHMLEEN BAJAJ<sup>1</sup>, SHWETA KUMAR<sup>2</sup>, KANGNA JUNEJA KANSAL<sup>3</sup>

## ABSTRACT

Labour pain represents one of the most intense forms of acute discomfort encountered during childbirth, prompting widespread dependence on pharmacological interventions like epidural analgesia. However, such methods may introduce notable side effects throughout the birthing process. In seeking alternative strategies focused on safety and maternal welfare, Transcutaneous Electrical Nerve Stimulation (TENS) has gained attention as a viable, non-drug-based method for alleviating pain during labour. Through specific nerve stimulation pathways, TENS enables the natural release of analgesics, offering meaningful symptom relief while permitting greater mobility. This review aims to assess and compare the effectiveness of TENS with standard epidural analgesia in reducing pain intensity among women in active labour, focusing on maternal satisfaction and birthing outcomes. A comprehensive literature review was performed using recent peer-reviewed studies (2020-2025) examining TENS during labour. Reviewed articles included randomised controlled trials and observational research,

with emphasis on method parameters, outcome measures, and comparison groups. The studies evaluated both subjective (pain scores, satisfaction) and objective (delivery type, complications) outcomes. Studies involving more than 2,500 participants found TENS can effectively reduce pain during childbirth when administered at high frequency and low intensity. Maternal satisfaction rates were comparable to, or higher than, those using pharmacological approaches, and TENS did not lead to an increase in complications or adverse neonatal outcomes. Although epidural analgesia was associated with greater absolute pain relief, TENS was preferred by participants valuing mobility and reduced side effects. TENS provides a safe and efficient alternative for pain management in labour, particularly beneficial for individuals seeking drug-free methods or when epidural use is not advised. Clinical best practices should include patient education, careful protocol adherence, and individualised application.

**Keywords:** Epidural comparison, Maternal satisfaction, Non-pharmacological analgesia, Obstetric outcomes

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# Influence of Scapular Stabilisation and Cervical Spine Alignment on Rotator Cuff Function: A Systematic Review\_

ADITI DIMRI<sup>1</sup>, BHUMIKA CHHIBBER<sup>2</sup>**ABSTRACT**

**Introduction:** The shoulder complex relies on precise interaction between the rotator cuff, scapula, and cervical spine to maintain dynamic stability and mobility. Dysfunction in either scapular control or cervical alignment—such as forward head posture or scapular dyskinesis—can alter neuromuscular activation, reduce subacromial space, and overload the rotator cuff. Conventional rehabilitation often emphasises isolated rotator cuff strengthening; however, growing evidence highlights the value of integrating scapular stabilisation and cervical postural correction.

**Aim:** This review aimed to evaluate the influence of scapular stabilisation and cervical spine alignment on rotator cuff function, and to determine the clinical impact of combined interventions in shoulder rehabilitation.

**Materials and Methods:** A systematic literature search was conducted in PubMed, Scopus, PEDro, and Web of Science using keywords including *scapular stabilisation*, *cervical spine alignment*, *rotator cuff function*, and *shoulder rehabilitation*. Studies involving adults ( $\geq 18$  years) with clinically or radiologically confirmed rotator cuff tears and functional limitations were included. Both conservative and surgical management studies were considered. Exclusion criteria were previous shoulder surgery (unless postoperative trials), other shoulder pathologies, neurological disorders, systemic inflammatory

diseases, fractures, infections, tumors, or non-compliance with protocols.

**Results:** Across studies, poor scapular stabiliser strength and altered kinematics were consistently associated with impaired rotator cuff efficiency and increased impingement. Cervical malalignment, particularly forward head posture, was shown to disrupt scapulohumeral rhythm and increase upper trapezius dominance. Interventions incorporating scapular stabilisation (serratus anterior and lower trapezius activation) alongside cervical postural correction demonstrated greater improvements in pain, range of motion, and functional performance than isolated cuff strengthening. Electromyography (EMG) trials further confirmed enhanced muscle recruitment when scapular activation preceded rotator cuff engagement.

**Conclusion:** This review emphasises that optimal rotator cuff rehabilitation should not be limited to isolated strengthening but must integrate scapular stabilisation and cervical alignment strategies. Such a holistic physiotherapy approach improves neuromuscular control, accelerates recovery, and reduces recurrence. Incorporating cervical and scapular assessment into routine shoulder rehabilitation protocols is strongly recommended to enhance clinical outcomes and long-term function.

**Keywords:** Cervical alignment, Dynamic stability, Shoulder rehabilitation

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# Exploring the Approaches of Performance Enhancement by Plyometric Exercise in Badminton Players: A Systematic Review

KHUSHI VATS<sup>1</sup>, ISHA GUPTA<sup>2</sup>, PRIYANKA SIWACH<sup>3</sup>

## ABSTRACT

**Introduction:** Plyometric exercises are widely used nowadays for athletes. Badminton is a sport that requires many performance parameters like agility, endurance and power with good reaction time, etc. Plyometrics includes high-intensity and velocity activities to improve power, speed, agility and endurance of an individual.

**Aim:** To perform a systematic review to evaluate how effective plyometrics would be for increasing these performance parameters in badminton players.

**Materials and Methods:** A comprehensive search was conducted across PubMed and Google Scholar for randomised controlled trials published between 2015 and 2025. Studies were screened through titles, abstracts and full texts based on predefined eligibility criteria.

**Result:** Included articles and research have shown us the significant increase in performance in the badminton players by affecting their power, agility, speed and endurance by giving some weeks of plyometric training. The data was collected pre and post the training given. Some studies have also given positive effects on balance and control.

**Conclusion:** Plyometric exercises are an effective method for improving the performance parameters, including power, agility, speed and endurance of badminton players. Large well-designed trials are present to prove the above-mentioned data.

**Keywords:** Agility, Explosive power, Plyometric training, Power training, Speed.

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# Impact of Smartphone Usage Patterns on Cognitive Outcomes in University Students: A Narrative Review

SHIMON MICHAEL MASSEY<sup>1</sup>, PREETI<sup>2</sup>, PRIYA DAGAR<sup>3</sup>, HIMANSHU GAKHAR<sup>4</sup>

## ABSTRACT

Smartphones have become a vital aspect of university life, which facilitates academics, social communication, and entertainment. However, the cognitive consequences of such extensive use remain unclear, especially when we take into account the purpose of smartphone use, whether academic, social, or recreational. This narrative review examines the impacts of such smartphone use patterns on cognitive performance, indicating reaction time, decision making, and dual-task performance among university students. The sources of the relevant studies include platforms like PubMed, ScienceDirect, Scopus, Cochrane, and PEDro databases. Eleven articles were shortlisted from the twenty that met the inclusion

criteria of being published between 2015 and 2025 and they were screened to ensure relevance and avoid duplication. Articles included were mostly cross-sectional, correlational, observational, and meta-analytic in design. The results show that long-term recreational and multitasking smartphone use is linked to sluggish reaction times, an increase in dual-task costs, and loss of executive control. Research on decision-making has shown a greater prevalence of impulsivity and preference for immediate rewards, and late-night use being linked to poor quality of sleep and diminished attention. Whereas study-related and well-organised smartphone usage shows neutral or adaptive impacts, potentially enhancing sustained attention when intentional. Taken together, it is likely that cognitive

inefficiency is more about context and intent of use than duration. Neurocognitive hypotheses refer to prefrontal fatigue, dopaminergic system desensitisation, and impaired circadian regulation. More longitudinal studies, which combine purpose-specific smartphone measurements and standard cognitive measures, are required to

clarify the causal relationship and digital behaviour interventions in university students.

**Keywords:** Cognitive dual-tasking, Decision making, Reaction time, Smartphone usage pattern

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# Understanding Posture-Pain Dynamics in Ankylosing Spondylitis: A Narrative Review

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## ABSTRACT

This review article responds to the question of whether postural changes in Ankylosing Spondylitis (AS) represent a cause, consequence, or aggravating factor of pain. AS is a chronic inflammatory disease of the axial skeleton that results in progressive stiffness, structural deformity, and functional impairment. Postural changes such as thoracic hyperkyphosis, forward head posture, loss of lumbar lordosis, and sagittal imbalance are frequently observed and are thought to contribute to mechanical strain, impaired mobility, and increased pain. However, the precise nature of the relationship between posture and pain in AS remains uncertain. This review summarises current evidence from randomised controlled trials, biomechanical studies, and systematic reviews published over the past two decades. Evidence indicates that abnormal postural

alignment is uniformly linked to increased pain intensity and lower quality of life. Evidence states that intervention in maintaining movement, spinal mobility, and functional exercise is a more significant contributor to pain reduction and quality of life compared to static posture correction alone. However, heterogeneity of methods, limited follow-up, and absence of standardised postural assessment tools confound the quality of existing evidence. In summary, although posture seems to be strongly associated with pain in AS, it is still uncertain whether postural deviation is a disease-related consequence or an underlying cause of pain. Longitudinal and methodologically sound studies are needed to better establish causality and to refine posture-based rehabilitation in this patient group.

**Keywords:** Ankylosing spondylitis, Rehabilitation, Spinal deformity

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# Effects of Exercise Interventions on Fatigue-Related Myalgia Associated with Postpartum Depression: A Narrative Review

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## ABSTRACT

Postpartum Depression (PPD) often occurs within the first year after childbirth and is commonly accompanied by fatigue and muscle pain (fatigue-related myalgia). These symptoms can negatively impact a mother's emotional well-being and ability to care for her baby. While medication is available, many women prefer non-drug treatments such as exercise. This review explores how structured physical activity may help reduce postpartum fatigue and depressive symptoms.

The impact of exercise on postpartum women's depression and fatigue is examined in this narrative review. Randomised Controlled Trials (RCTs), systematic reviews, and meta-analyses were the main topics of the studies that were gathered from PubMed, ScienceDirect, the Cochrane Library, and Web of Science. Included studies tested structured exercise programmes such as aerobic training, yoga, aquatic therapy, relaxation techniques, or a combination of these, and specifically looked at postpartum women. They also used validated tools to measure fatigue, myalgia, or depressive symptoms. The studies with unclear results or unstructured activities were excluded. The review compares the types, frequency, and duration of exercise to determine what works and where there is still a lack of evidence.

The findings show that moderate-intensity exercises—such as Pilates, walking, aerobic workouts, and aquatic routines—consistently improved fatigue, depressive symptoms, sleep quality, and functional ability in postpartum women. The most effective programmes were those that lasted 6-12 weeks and were supervised or performed in group settings. Home-based or low-intensity routines were generally less effective.

Supervised and group-based exercise interventions provided both physical and psychological benefits, helping to reduce symptoms of fatigue and depression. Key factors influencing success included exercise type, intensity, duration, and consistency. Long-term participation and support were also crucial in maintaining results, and group settings offered added emotional and social benefits.

Structured, moderate-intensity exercise is a safe and effective strategy to manage postpartum fatigue and depression. It should be included as part of routine postnatal care. Future research should focus on identifying the most effective exercise formats and ways to encourage ongoing participation, particularly among women at high risk for postpartum mental health issues.

**Keywords:** Aerobic exercise, Anxiety, Aquatic exercise, Depression, Pilates, Postpartum fatigue, Quality of life, Sleep quality, Structured exercise, Walking

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# Blending Yoga with Modern Sports Science - Ancient Wisdom, Modern Performance: A Review

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## ABSTRACT

Yoga is an ancient Indian discipline that focusses on body, mind, and spirit harmony. In contrast, modern sports science optimises athletic performance by utilising psychology, physiology, and biomechanics. A comprehensive model for improving physical fitness, recuperation, and mental health is offered by combining

these two strategies. The relationship between yoga and sports science in modern athletic training is examined in this abstract. This review aimed to evaluate the role of yoga when blended with modern sports science in improving physical performance, psychological resilience, and rehabilitation outcomes in athletes. Databases like PubMed, Scopus, and Google Scholar were used

to review pertinent research published between 2015 and 2024. Yoga interventions in athletic or physically active populations were the subject of reviews, experimental studies, and randomised controlled trials. Flexibility, strength, endurance, mental focus, cardiorespiratory efficiency, and recovery speed were among the outcomes that were examined.

Several advantages of integration were identified by the analysis-

- *Flexibility & Injury Prevention:* Yoga poses improved joint mobility and decreased strain on the musculoskeletal system.
- *Breathing Efficiency & Endurance:* Pranayama increased stamina and lung function.
- *Mental Focus & Stress Reduction:* Meditation techniques helped people perform at their best under pressure, reduced anxiety, and improved concentration.

- *Recovery & Rehabilitation:* Yoga reduced delayed muscle soreness, enhanced balance, and sped up post-exercise recovery.
- *Performance Improvement:* Yoga resulted in quantifiable gains in agility, posture, and coordination when paired with sports science concepts like strength training and biomechanics.

Yoga's integration with modern sports science provides an evidence-based, culturally grounded, and long-lasting approach to athlete development. It supports both elite and grassroots sports by boosting mental and physical capabilities. In the context of contemporary athletics, this hybrid approach offers a progressive model for comprehensive training and recovery.

**Keywords:** Athletic performance, Flexibility, Endurance, Mind-body integration, Rehabilitation

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# The Athlete's Nightmare: A Comprehensive Review of Quadriceps Contusion Grading and Rehabilitation Strategies: A Scoping Review

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## ABSTRACT

Among the most prevalent catastrophic injuries in contact sports are quadriceps contusions, which can result in functional impairment, extended playtime absences, and possible long-term complications like myositis ossificans. To maximise recovery, reduce recurrence, and guarantee a safe return to sports, accurate grading and prompt rehabilitation are essential. However, evidence-based clinical decision-making is impeded by variations in grading schemes and rehabilitation procedures.

This review aimed to synthesise existing literature, providing a practical assessment of the strengths and weaknesses of current systems for grading and managing quadriceps muscle injuries.

A scoping review of 24 peer-reviewed studies were conducted using databases including PubMed, Scopus, and Google Scholar from 2015 to 2025. Relevance, methodological accuracy, and clinical outcomes were the criteria used to screen the studies. To compare grading standards, diagnostic methods, and rehabilitation frameworks, data were thematically synthesised.

Three main grading schemes were identified by analysis: hybrid classifications, imaging-assisted (MRI, ultrasound), and clinical

severity-based. Considering that it is accessible, clinical grading is still the most popular method, but in more serious cases, imaging improves diagnostic accuracy. Early pain management, progressive strengthening, gradual range-of-motion exercises, and sport-specific drills were all consistently emphasised in rehabilitation strategies. Adjunct modalities like cryotherapy, neuromuscular stimulation, and blood flow restriction training has been shown to improve recovery in recent studies.

Athletic performance is still significantly hampered by quadriceps contusions, and clinical results are impacted by inconsistent grading and rehabilitation techniques. Even though multimodal, progressive rehabilitation produces positive outcomes, there is an urgent need for agreement on evidence-based grading and protocol standardisation. To maximise athlete recovery and return-to-sport timelines, future research should concentrate on high-quality trials combining objective biomarkers, cutting-edge therapeutic modalities, and advanced imaging.

**Keywords:** Muscle injury grading, Return-to-sport, Sports injury

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# Comparative Effect of Plyometric Training versus Sportsmetrics Jump Training on Explosive Strength, Speed and Agility in Under-18 Basketball Players: A Systematic Review

DISHA BANSAL<sup>1</sup>, GAURAV KADYAN<sup>2</sup>**ABSTRACT**

**Introduction:** Explosive strength, speed, and agility are critical components of athletic performance. Although plyometric training and the Sportsmetrics jump training programme are widely used plyometric exercises, to enhance these attributes, yet no studies have directly compared their effectiveness in adolescent basketball players.

**Aim:** This study aims to systematically review the comparative effects of plyometric training versus the Sportsmetrics jump training programme on explosive strength, speed, and agility in under-18 basketball players.

**Material and Methods:** Following the PRISMA 2020 guidelines, a systematic electronic search was conducted across PubMed, ResearchGate and Google Scholar databases from July to August 2025. Eligible studies were those that evaluated the effects of either the plyometric training or the Sportsmetrics jump training programme in male or female basketball players under-18 years of age, reported at least one outcome measure of interest, and were published in the English language. Risk of bias was assessed

using the PEDro scale (RCTs) and Newcastle-Ottawa scale (non-RCTs). The protocol has been registered in PROSPERO 2025 (ID: CRD420251146587).

**Results:** A total of six studies were included, which enabled the outcomes of plyometric training (n=5) and the Sportsmetrics jump training (n=1) programmes to be narratively synthesised. The results indicated that plyometric training showed significant improvement in explosive strength, but low to moderate effects in speed and agility, while the single Sportsmetrics study reported enhancement in explosive strength.

**Conclusion:** Plyometric training demonstrated consistent effects on explosive strength, speed and agility, while the Sportsmetrics jump training programme showed potential benefits, but evidence was limited to a single study. Hence, further trials directly comparing the two interventions are needed to establish their relative effectiveness in under-18 basketball players.

**Keywords:** Adolescent, Athletic performance, Plyometric exercise, Systematic review

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# Intelligent Wearable Device the Future of Sports Medicine: A Narrative Review

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## ABSTRACT

Injuries resulting from sports can pose a substantial problem for players' economic well-being and quality of life. A new age of proactive injury prevention has begun with the recent integration of Artificial Intelligence (AI) and Inertial Measurement Unit (IMU) devices. IMU provides real-time objective data on the athletes' movement, fatigue and workload allowing early detection of overuse or improper technique. These sensors combine accelerometers, gyroscope and magnetometers to track acceleration, orientation and direction. AI provides valuable direction for the analysis of this data to make adjustments to the training.

This review aimed to explore the impact of AI and IMU wearables in sports physiotherapy to provide sports performance monitoring, prevention of injury and optimisation in training. The databases

PubMed, Google Scholar and Science Direct were researched thoroughly, duplicates were removed and final data were extracted. The database search yielded a total of 250 articles, of which only five met the inclusion criteria.

AI-powered wearables have enabled athletes to have better athletic performance, physiological efficiency and reduced injury risk. AI assisted training increased sprint speed, endurance, and shortened muscle recovery time and prevented injury, which ultimately raised athletes' performance. AI and wearable technology have completely transformed sports training from injury prevention and diagnosis to recovery and performance enhancement.

**Keywords:** Artificial intelligence rehabilitation, Inertial measurement unit, Sports injury prevention, Technology, Wearable devices

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# Enhancing Balance and Mobility Rehabilitation in Diabetic Neuropathy through Virtual Reality: A Review

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## ABSTRACT

Diabetic Peripheral Neuropathy (DPN) is a prevalent complication of diabetes characterised by sensory deficits, proprioceptive loss, neuropathic pain, and gait disturbances, which significantly impair functional independence and increase fall risk. Conventional physiotherapy addresses these impairments but may be limited by low patient engagement and insufficient sensory feedback. Virtual Reality (VR) provides immersive, interactive environments that enhance motor learning, sensory integration, and neuroplasticity, thereby offering potential therapeutic advantages in DPN rehabilitation.

A scoping review was conducted following the framework of Arksey and O'Malley. Electronic databases including PubMed, PEDro, Scopus were systematically searched using relevant key terms. Studies were screened by title and abstract, and those evaluating

VR interventions in individuals with DPN were included. Data on participant characteristics, intervention protocols, and outcomes were descriptively analysed.

A total of 243 records were identified, with nine studies meeting inclusion criteria. VR interventions demonstrated significant improvements in postural stability, gait parameters, sensory feedback, pain modulation, and functional mobility compared to conventional therapy alone.

VR shows considerable potential as an adjunct to physiotherapy for DPN rehabilitation. Further randomised controlled trials are required to establish standardised protocols and long-term efficacy.

**Keywords:** Balance training, CNS dysfunctions, Gait rehabilitation, Neurological dysfunction, Neurorehabilitation

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# Exercise-Driven Brain Adaptation: Unlocking Athlete Cognition and Neuroplasticity: A Narrative Review

PRAGATI PARWAL<sup>1</sup>, STUTI KHANNA<sup>2</sup>, GARIMA WADHWA<sup>3</sup>**ABSTRACT**

Neuroplasticity is the brain's lifelong capacity to reorganise, driving habit formation, skill learning, and recovery. In sports, it supports motor learning, coordination, reaction time, and skill refinement. Repetitive, task-specific practice strengthens the motor cortex and enhances brain muscle communication.

This review aims to explore the role of neuroplasticity in sports training with a focus on motor learning, skill acquisition, performance, and rehabilitation.

A narrative review was conducted. Databases including PubMed, Google Scholar, Research Gate, and ScienceDirect were searched for studies published between 2017 and 2025 using key terms. Identified publications were searched by title and abstract.

The database search yielded a total of 345 articles of which only 10 met the inclusion criteria. Training induces neuroplastic changes, improving cortico-spinal connectivity, coordination, and reaction time. Open-skill sports enhanced decision-making and attention, while closed-skill sports improved precision and memory. Case evidence and experimental studies confirmed cortical reorganisation through task-specific practice. Neuroplasticity also supported rehabilitation, emotional adaptation, and return-to-play.

This review concludes that exercise induces neuroplastic changes which significantly improves the performance of athletes.

**Keywords:** Athletes, Cortical reorganisation, Motor learning, Sports rehabilitation

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# Exercise Interventions Targeting Physical Fitness, Cardiovascular Outcomes and Body Composition in Early Adulthood Obesity: A Systematic Review

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## ABSTRACT

**Introduction:** Obesity during early adulthood is a growing public health concern, strongly associated with an increased risk of developing chronic conditions such as cardiovascular disease, reduced physical functioning, and unfavorable body composition. A clearer understanding of these outcomes is essential to optimise prevention and treatment strategies for obesity-related complications in this age, which is determined by different modes of exercise in this systematic study.

**Aim:** This systematic review aimed to evaluate and synthesise evidence from Randomised Controlled Trials (RCTs) assessing the effects of structured exercise interventions on physical fitness parameters, cardiovascular outcomes and anthropometric measures in obese individuals.

**Materials and Methods:** The PubMed, Scopus and Google Scholar databases were utilised to search for the literature. Titles, abstracts and subsequently the full texts were screened to identify papers that met the inclusion criteria. The methodological quality of the studies was assessed on the 11-point PEDro scale. Risk of Bias assessment was carried out using the Risk of Bias 2 (RoB 2) tool in Cochrane review tools. Studies were included.

**Results:** Ten studies met the inclusion criteria. This indicated that exercise interventions, especially combined aerobic and resistance training, significantly improved VO<sub>2</sub> max and muscular strength in physical fitness, cardiovascular benefits included reductions in systolic and diastolic blood pressure and resting heart rate. Anthropometric benefits comprised reductions in body weight, Body Mass Index (BMI) and waist circumference. Combined training was always made superior to aerobic or resistance training alone for all outcomes assessed.

**Conclusion:** Exercise interventions present, especially those that include both aerobic and resistance training are effective in enhancing physical fitness, cardiovascular indices, and body composition among obese young adults. The evidence provides support for the inclusion of structured exercise as a key component of obesity treatment during early adulthood, but furthermore, studies are needed to confirm long-term effects and outcomes.

**Keywords:** Anthropometric outcomes, Exercise intervention, Physical functioning

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# Efficacy of Square Stepping Exercises versus Conventional Balance Training on Balance, Gait Speed and Fear of Fall among Frail Individuals: A Pilot Study

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## ABSTRACT

**Introduction:** Frailty is a state of increased vulnerability due to age-related decline across multiple systems, often leading to walking difficulties and higher fall risk. Square Stepping Exercise (SSE) is a cognitively engaging, low-cost intervention performed on a grid-patterned mat, challenging visuomotor coordination, dynamic balance, and anticipatory adjustments, potentially enhancing neuroplasticity and sensorimotor integration.

**Aim:** As the growing burden of frailty and its associated healthcare costs, the findings of this study could have significant implications for improving functional independence and quality of life among frail individuals and provide evidence-based recommendations for clinicians to optimise fall prevention strategies.

**Materials and Methods:** Thirty-six participants (both male and female, aged 60-85 years) were randomly assigned into two groups using the chit method: Group A {SSE + Conventional Balance Training (CBT)} and Group B (CBT). Inclusion criteria were Fried Frailty Scale  $\geq 3$ , Hindi Mini-Mental State Examination  $\geq 21$ , and Tinetti POMA  $> 19$ . Exclusion criteria included regular exercise participation in the past 3 months or presence of any severe musculoskeletal, neurological, or cardiovascular disorders interfering

with safe participation. Both groups underwent supervised training for 4 consecutive weeks (3 sessions/week, 40-45 min/session). The following outcome measures were assessed at baseline and post-intervention: Mini-BESTest (balance), 6-Metre Gait Speed Test (gait speed), and Hindi-Version Fall Efficacy Scale (fear of fall).

**Results:** Both groups demonstrated significant improvements for within-group analysis on Mini-BESTest ( $p=0.012$ ), 6m-GS ( $p=0.002$ ) and H-FES ( $p=0.024$ ) from baseline and post-intervention. However, between-group comparisons showed that participants in the SSE+ CBT group showed significant improvements on MiniBESTest ( $p=0.046$ ) and 6m-GS ( $p=0.0014$ ), whereas non-significant results were observed in H-FES ( $p=0.57$ ), compared to the CBT group.

**Conclusion:** Square Stepping Exercises combined with CBT were more effective than CBT alone in improving balance, enhancing gait speed, and reducing fear of fall among frail individuals. This pilot study suggests that SSE may be a valuable, low-cost, and clinically feasible adjunct to traditional balance training programs for fall prevention and functional independence among frail individuals.

**Keywords:** Frailty, Sensorimotor integration, Visuomotor coordination

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# Therapeutic Role of taVNS in Neuro Rehabilitation: A Narrative Review of Current Evidence

SIMRAN<sup>1</sup>, AMAN KANDA<sup>2</sup>

## ABSTRACT

**Introduction:** Non-invasive neuromodulation techniques are increasingly being recognised for their potential to improve outcomes in neurorehabilitation. Transcutaneous auricular Vagus

Nerve Stimulation (taVNS) is an emerging, low-risk technique that stimulates auricular branch of the vagus nerve, which influences the central nervous system activity, promotes neuroplasticity, and supports functional recovery. Given that taVNS has been applied in

various neurological conditions, it is important to conduct a thorough review of its current therapeutic effectiveness in neurorehabilitation to guide clinical practice and direct future research.

**Aim:** The purpose of this narrative review is to compile and analyse the existing evidence regarding the therapeutic use of taVNS in neurorehabilitation among individuals with chronic neurological conditions.

**Materials and Methods:** A comprehensive search was carried out across PubMed, Google Scholar, and Cochrane Library from 2015 to 2025. After screening, Randomised Controlled Trials (RCTs) and pilot studies were included, which examined the effects of taVNS in participants with neurological disorders.

**Results:** The studies showed varying levels of effectiveness across the different patient groups. The taVNS improved sleep quality and measurable sleep parameters, motor function and nonmotor symptoms like gait, balance, sensorimotor integration, and cardiovascular regulation. It also increased cortical arousal and alertness, and improved brain connectivity. Overall, taVNS was found to be safe and well-tolerated in all the studied populations.

**Conclusion:** The current findings suggest that taVNS has a promising role in neurorehabilitation.

**Keywords:** Chronic insomnia, Neurological rehabilitation, Parkinson disease, Stroke, Vagus Nerve stimulation.

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# Effects of Training Transversus vs Rectus Abdominis in Diastasis Recti: A Scoping Review

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## ABSTRACT

Diastasis Recti Abdominis (DRA) is a common postpartum condition marked by the separation of the rectus abdominis muscles, leading to reduced core stability and altered biomechanics. The prevalence of DRA decreases to approximately 52% by 4-6 weeks after delivery and about 39% by six months. Clinically, DRA is identified when the Inter-Recti Distance (IRD) exceeds 1.5 cm at the xiphoid, 2.2 cm above, or 1.6 cm below the umbilicus. Rehabilitation programmes focussing on transversus abdominis activation, Pelvic Floor Muscle (PFM) training, and hypopressive exercises have shown positive outcomes.

To review available evidence on the effectiveness of Rectus Abdominis (ReA) and Transversus Abdominis (TrA) training in reducing Inter-Recti Distance (IRD).

A literature search was conducted using PubMed, Scopus, Google Scholar, Research Direct, and Elsevier with keywords including

diastasis recti, exercise, IRD and postpartum. Case reports and studies without exercise interventions were excluded, while full-text English reviews, eligible RCTs, and CCTs were included.

A significant reduction in IRD (0.8-1.5 cm) was reported after 6-12 weeks of training. All rehabilitation programmes improved IRD, core stability, and functional performance. TrA-focussed exercises consistently showed better outcomes than traditional abdominal training, while TrA combined with PFM activation produced the most comprehensive results.

TrA-focused exercise protocols were more effective in reducing IRD and improving core function than ReA-based training. Deep core stabilisation exercises are effective for postpartum DRA. Standardised protocols and more high-quality studies are needed to establish best practices and enhance maternal health outcomes.

**Keywords:** Postpartum, Rehabilitation, Transverse abdominis

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# Integrating Virtual Reality with Constraint-Induced Movement Therapy for Motor Recovery in Spastic Hemiplegic Cerebral Palsy Patient: A Review

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## ABSTRACT

Cerebral Palsy (CP) refers to a group of disorders that affect movement, posture, and coordination due to early brain damage affecting 2-3 children per 1,000 years. This condition, which is not progressive, typically results from injury before, during, or shortly after birth, while the brain is still developing. Spastic hemiplegic CP is a common form that impacts one side of the body, reducing a child's ability to perform everyday tasks independently. Although the initial brain injury does not worsen, changes in movement can occur over time due to growth, nervous system development, muscle imbalances, and treatment responses. Over the past two decades, rehabilitation strategies such as Constraint-Induced Movement Therapy (CIMT) and Virtual Reality (VR)-based interventions have gained attention for improving motor performance and functional independence in children with hemiplegic CP.

This review aimed to summarise and compare the evidence on the effectiveness of CIMT and VR in enhancing upper limb function, motor control, and participation in children with CP.

An extensive search of databases, including PubMed, Scopus, Web of Science, and Google Scholar were searched for articles published

between 2005 and 2025 only in English language. Studies focusing on children aged 3-16 years with CP undergoing CIMT and VR-based rehabilitation were included. Randomised controlled trials and pilot studies were analysed.

CIMT has been shown to improve hand function, strength, and the performance of specific upper-limb tasks through structured, repetitive practice. VR-based therapy offers similar benefits, particularly in enhancing movement speed, coordination, and user motivation, due to its interactive and engaging design. While CIMT is effective for refining targeted motor skills, VR tends to boost participation and consistency. Integrating both methods may provide more comprehensive and effective rehabilitation outcomes. Both CIMT and VR-based therapies are evidence-supported for improving upper-limb function in children with CP. VR offers a motivating and accessible option, whereas CIMT remains a gold standard for structured motor retraining. Future studies should explore combined protocols, long-term outcomes, and accessibility of VR in clinical and home-based settings.

**Keywords:** Muscle imbalance, Paediatric neurorehabilitation, Upper-limb rehabilitation

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# The Role of ChatGPT in Sports Rehabilitation: A Narrative Review

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## ABSTRACT

Artificial Intelligence (AI) is increasingly applied in healthcare, with large language models such as ChatGPT showing potential in physiotherapy and sports rehabilitation. These tools may support clinicians, improve patient education, and enhance rehabilitation planning. However, their clinical utility and limitations need to be critically evaluated. This article aims to review recent evidence on the role of ChatGPT in sports rehabilitation and physiotherapy practice.

A narrative review of recently published articles was conducted. The studies assessed ChatGPT in areas including musculoskeletal rehabilitation, decision support, patient education, and individualised rehabilitation programme design. Findings were synthesised thematically.

Five key insights were identified. ChatGPT demonstrated potential for interdisciplinary support by simulating expert panel discussions, though limitations in emotional nuance and privacy remain. GPT-4

responses aligned strongly with musculoskeletal rehabilitation guidelines but lacked consistency and detail in specific interventions. ChatGPT generated largely accurate clinical content but often produced unreliable or fabricated references. Decision-support accuracy reached approximately 80%, with strong performance in the upper limb (100%) and lower limb (87%) rehabilitation, but weaker outcomes for spinal cases (60%). In knee osteoarthritis, ChatGPT achieved 74% agreement with an expert-designed rehabilitation protocols, though detailed progression and frequencies were insufficiently addressed.

ChatGPT shows promising applications in sports rehabilitation by supporting clinical decision-making, enhancing patient education, and assisting with personalised programme planning. However, challenges such as incomplete clinical detail, unreliable referencing, and ethical considerations highlight the need for human oversight. It should be considered a complementary tool rather than a replacement for physiotherapists. Future research must focus on clinical validation and regulatory frameworks for safe integration.

**Keywords:** Artificial intelligence, Digital health, Physiotherapy

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# Comparison of Box Breathing and Deep Breathing Exercises on Functional Capacity in CABG Patients: A Pilot Study

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## ABSTRACT

**Introduction:** Coronary Artery Bypass Grafting (CABG) patients frequently present with reduced functional capacity after surgery, largely due to impaired pulmonary function and deconditioning. Breathing exercises are a cornerstone of cardiac rehabilitation. However, limited evidence exists comparing the effectiveness of box breathing with incentive spirometer-based deep breathing exercises in this population.

**Aim:** To compare the effects of box breathing and incentive spirometer-assisted deep breathing on functional capacity in post-CABG patients.

**Material and Method:** This pilot study will recruit post-CABG patients who will be randomly divided into two groups. Group A will perform *box breathing* (6 cycles per session) daily for 5 consecutive days. Group B will perform *deep breathing exercises* using an incentive spirometer for the same duration. Functional capacity will

be assessed using the Six-Minute Walk Test (6MWT) before and after the intervention. Data will be analysed to evaluate within-group and between-group differences.

**Expected Result:** It is anticipated that both groups will demonstrate improvements in 6MWT distance, indicating enhanced functional capacity. Box breathing is expected to show outcomes comparable to, or possibly greater than, incentive spirometer-based deep breathing.

**Conclusion:** This pilot study will provide preliminary insights into the role of different breathing strategies in improving functional capacity in CABG patients. Findings may support the inclusion of simple, equipment-free methods like box breathing in cardiac rehabilitation programmes.

**Keywords:** Coronary artery bypass grafting, Incentive spirometer, Six-minute walk test.

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# Acute Facet Joint Dysfunction in a Young Female Following Tug of War: A Case Report

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## ABSTRACT

Facet joint dysfunction is a common but often underdiagnosed cause of mechanical low back pain, frequently mimicking discogenic pain. It may develop following sudden or repetitive lumbar loading, and recognition of characteristic symptom patterns with positional relief is crucial for accurate diagnosis.

We report the case of a 28-year-old female who presented with gradual-onset low back pain after participating in a tug of war one week earlier. The pain progressively worsened and was aggravated by prolonged sitting, standing, walking, and lying in prone or supine positions, while relief was achieved in side-lying and slouched sitting postures. Neurological examination was normal, with no motor or sensory deficits. Clinical assessment suggested L4-L5 facet joint dysfunction. Conservative management included patient education, activity modification, flexion-biased exercises, cryotherapy with ice

packs, therapeutic ultrasound, and Transcutaneous Electrical Nerve Stimulation (TENS). After three weeks of treatment, the patient reported marked improvement, with pain intensity decreasing from 7/10 to 4/10 on the Visual Analogue Scale (VAS), accompanied by improved tolerance of daily activities.

This case emphasises the importance of considering facet joint dysfunction in young patients presenting with acute low back pain following sudden spinal loading. The presence of pain aggravated by extension and relieved by flexion-related positions provides a valuable clinical clue. Early recognition and targeted conservative management can lead to significant pain reduction, functional recovery, and prevention of chronicity.

**Keywords:** Mechanical low back pain, Physiotherapy, Transcutaneous electrical nerve stimulation

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# The Effect of Incentive Spirometry and Deep Breathing Exercise in Cardiopulmonary Patient: An Interventional Study

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## ABSTRACT

**Introduction:** Pulmonary complications are one of the most frequent issues following cardiopulmonary and thoracic surgery, even in the face of improved surgical care. Atelectasis, secretion retention, postoperative pain and anxiety, compromised ventilatory function are commonly encountered making it difficult for patients to breathe deeply or cough efficiently and contribute to extended stays in the hospital and increased costs of recovery. To treat these problems, respiratory physiotherapy is commonly employed. Of the options available Incentive Spirometry (IS) and Deep Breathing Exercises (DBE) are the most prevalent. IS stimulates the patient to breathe slowly and deeply with visual feedback, whereas DBE is based on

controlled inhalation via the nose with relaxed exhalation. Both are simple to use, risk-free, and cost-effective.

**Objective:** The aim of this study was to evaluate the role of IS and DBE in patients recovering from cardiopulmonary surgery and to compare their effect on oxygen saturation and chest expansion.

**Methods:** Thirty patients aged between 40 and 69 years were included, all treated at Apex Hospital and Apex College of Physiotherapy, Varanasi. They were equally distributed into two groups: 15 patients in Group A underwent IS, and 15 in Group B had DBE. The intervention was for a period of three weeks, with three supervised sessions weekly. Outcomes were assessed through oxygen saturation (SpO<sub>2</sub>), as measured using a pulse

oximeter, and chest expansion, as measured with a tape. Pre- and post-programme assessments were done.

**Results:** Both groups improved greatly. In Group A, p-values were 0.000000015 for SpO<sub>2</sub> and 0.000073 for chest expansion. In Group B, p-values were 0.0000000074 and 0.0000000043, respectively. The findings indicate that both interventions increased lung capacity, oxygenation, and alleviated breathlessness.

**Conclusion:** Incentive spirometry and the performance of DBE were similarly effective in improving postoperative pulmonary function. Since both are useful techniques, the selection can be based on patient comfort and preference. Incorporation of either of these easy manoeuvres into standard care can reduce complication rates, accelerate recovery, and enhance results.

**Keywords:** Forced expiratory volume, Lung capacity, Post-surgical

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# Effect of Aerobic Endurance Exercises and Relaxation Training on Young Adult having Migraine: A Comparative Study

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## ABSTRACT

**Introduction:** Migraine is one of the most disabling neurological conditions worldwide. It causes repeated, severe headaches, often on one side of the head, along with nausea, vomiting, and sensitivity to light and sound. These symptoms are linked to neurovascular changes and possible brainstem dysfunction. Since medicines may not always be effective or suitable for long-term use, non-drug approaches like exercise and relaxation are gaining importance.

**Aim:** This study compared the effect of aerobic endurance exercise and relaxation training on reducing migraine severity and frequency in young adults.

**Materials and Methods:** A total of 20 subjects meeting the inclusion criteria were recruited and randomly divided into two groups (N=10 each).

- Group A: Performed aerobic endurance exercises for 15 days.
- Group B: Followed relaxation training for the same duration.

Outcome measures included the Numeric Pain Rating Scale (NPRS) for pain intensity and the Migraine Severity Scale (MIGSEV)

for symptom impact. Pre- and post-intervention scores were statistically analysed using paired t-tests.

**Results:** Both groups showed a clear reduction in migraine symptoms after the intervention (p<0.001).

- Aerobic exercise group: NPRS scores improved from 6.2±2.10 to 4±2.11.
- Relaxation group: NPRS scores reduced from 5.8±1.62 to 4.1±1.52.

MIGSEV scores also decreased in both groups, showing improvement in severity and daily impact.

**Conclusion:** Both aerobic endurance exercise and relaxation training significantly reduced migraine symptoms over the 15-day programme. There was no significant difference between the two, suggesting that either method can be used as a safe, effective, and practical non-pharmacological option for managing migraine in young adults.

**Keywords:** Brainstem dysfunction, Migraine Severity Scale, Numeric Pain Rating Scale

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# Post-operative Rehabilitation after Posterior Decompression and Pedicle Screw Fixation in Patient with PIVD and Lumbar Canal Stenosis: A Clinical Case Study

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## ABSTRACT

**Introduction:** Low back pain is a major global health concern and one of the leading causes of disability worldwide. Structural pathologies such as Prolapsed Intervertebral Disc (PIVD), lumbar spinal stenosis, and degenerative scoliosis are common contributors. Their coexistence poses a complex clinical challenge requiring surgical and multidisciplinary rehabilitative management.

**Case Description:** A 65-year-old female presented with chronic low back pain radiating to the left lower limb, accompanied by tingling and numbness. Radiological and clinical evaluation confirmed PIVD at L3-S1, lumbar canal stenosis, and degenerative scoliosis with an 18° Cobb angle. Special tests, including straight leg raise and slump, were positive. Surgical management involved posterior decompression with laminectomy, medial facetectomy, discectomy, and pedicle screw fixation at L3-S1.

**Intervention:** A structured, phased physiotherapy rehabilitation programme was initiated. During the inpatient phase (0-7 days),

goals included pain control, breathing exercises, log rolling, gentle limb mobilisation, and early ambulation with a spinal brace. The early outpatient phase (1-3 weeks) emphasised progressive mobility, core activation, and independent ambulation. The later outpatient phase (4-8 weeks) incorporated advanced gait training, trunk and lower-limb strengthening, endurance building, stair climbing, squats, and balance exercises.

**Outcomes:** The patient demonstrated significant reductions in Numeric Pain Rating Scale (NPRS) scores and improvements in Oswestry Disability Index (ODI), highlighting pain reduction, enhanced spinal stability, functional independence, and better quality of life.

**Conclusion:** Individualised, phase-wise rehabilitation following posterior decompression and pedicle screw fixation optimises recovery, restores function, and promotes safe reintegration into daily life.

**Keywords:** Numeric pain rating scale, Oswestry Disability Index, Prolapsed intervertebral disc

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# Assessment of Fatigue Among Pregnant Women Using the Fatigue Assessment Scale: A Cross-Sectional Study

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## ABSTRACT

**Introduction:** Fatigue is a common symptom in pregnancy, especially in the first and third trimesters, caused by hormonal changes like increased progesterone, increased blood volume and heart rate, and the physiological demands of supporting foetal development,

disrupted sleep. It may affect physical as well as psychological well-being and maternal quality of life.

**Aim:** This study aimed to assess the prevalence and the severity of fatigue among pregnant women using the FAS questionnaire and to explore its association with demographic and obstetric variables.

**Materials and Methods:** A cross-sectional survey will be conducted among pregnant women attending the Gynecology OPD. Participants will be administered the Fatigue Assessment Scale (FAS) questionnaire, a 10-item self-reported measure of fatigue. Its scoring will be done out of a total score of 50, with a cut-off values, 10-21, no fatigue; 22-34, substantial fatigue and more than 35, severe fatigue. Demographic characteristics and obstetric variables will be collected. The questionnaire will be distributed to pregnant females coming for antenatal checkups; 155 filled questionnaires will be collected; the data will be coded and stored in MS Excel.

**Result:** Responses will be analysed to assess the severity of fatigue experienced in various trimesters and their effect on Quality of Life (QOL) and physical and mental well-being of the pregnant women. Statistical association between fatigue levels and age of mother as well as gravid and period of gestation will be calculated.

**Conclusion:** Fatigue is highly prevalent among pregnant women and warrants greater attention in routine antenatal care. The FAS questionnaire is a valid tool for assessing fatigue, highlighting the need for early identification and supportive interventions to improve maternal well-being.

**Keywords:** Antenatal care, Maternal health, Pregnancy

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# Variations in Perceived Exertion during Climbing Stairs and Elevated Walking

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## ABSTRACT

**Background:** Stair climbing and walking on a ramp are considered low-impact activities. However, the quantification and effect of physiological and cardiovascular responses are lacking. Understanding these differences is crucial for developing targeted exercise protocols that will give overall health benefits and help regulate vital physiological covariates.

**Aim:** To compare the changes in rate of perceived exertion by comparing heart rate and blood pressure before and after exertion in adults while climbing stairs and walking on an elevated ramp.

**Methodology:** A total of 30 subjects participated in the activity, which was divided into two groups: 15 subjects walked on the elevated ramp, and 15 subjects climbed the stairs. Once the subject is ready, they are asked to complete the IPAQ short version questionnaire, and a modified Borg rating scale is administered to assess their

breathing rate. A pulse oximeter, a sphygmomanometer, and an RPE scale were used to determine the exertion rate in the adults.

**Result:** A total of 30 subjects were recruited, with 15 subjects using stairs and 15 subjects using a ramp to assess the rate of perceived exertion. There was a significant difference in exertion rate, as measured by respiratory rate and blood pressure, between the two activities.

**Conclusion:** The study concludes that while ramp walking and stair climbing have similar health advantages, stair climbing is a more strenuous kind of exercise. To optimise benefits and adherence, exercise prescription should take into account cardiovascular health, individual fitness levels, and personal preferences, as well as long-term adaptations to these activities.

**Keywords:** Perceived stress, heart rate, stair climbing, ramp walk, respiratory rate.

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# Development of AI-Driven Fatigue Detection System Using Wearable EMG Sensors for Safe Resistance Training

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## ABSTRACT

**Introduction:** Muscle fatigue is a key factor contributing to musculoskeletal injuries during resistance training. Traditional physiotherapy assessments, such as manual muscle testing and observational analysis, are often subjective and fail to capture real-time fatigue. Wearable surface Electromyography (sEMG) sensors provide objective monitoring of muscle activity, and when integrated with Artificial Intelligence (AI) methods such as Support Vector Machines (SVMs) and Convolutional Neural Networks (CNNs), they offer promising potential for real-time fatigue detection.

**Aim:** To review the current literature on AI-driven fatigue detection systems using wearable EMG technology in resistance training and evaluate their clinical implications for physiotherapy-based injury prevention and rehabilitation.

**Materials and Methods:** A literature search was conducted in PubMed, IEEE Xplore, Scopus, and Google Scholar for studies published between 2010 and 2025. Studies involving EMG-based AI models for fatigue detection in healthy adults during resistance or strength training were included. Extracted data focused on EMG

features such as Median Frequency (MF), Mean Power Frequency (MPF), and root mean square (RMS), along with model performance and sensor accuracy.

**Results:** Twenty-four studies met the inclusion criteria. AI models, including SVM, Random Forest, and CNN, demonstrated fatigue classification accuracies between 82% and 94%. Reductions in MF and MPF by 10-25% consistently indicated fatigue, while correlations with biomechanical markers ( $r > 0.70$ ) supported their validity. Real-time EMG feedback reduced compensatory movements by up to 50% during resistance training. Integration with wearable platforms enabled mobile-based alerts, improving exercise safety and personalisation.

**Conclusion:** AI-integrated wearable EMG systems provide reliable, real-time fatigue detection in resistance training. They enhance physiotherapy assessment by delivering objective, dynamic insights into neuromuscular performance, thereby supporting safer training and individualised rehabilitation strategies.

**Keywords:** Fatigue detection, EMG, Artificial Intelligence, Resistance training, Wearable technology

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# Effect of Aerobic Exercises versus Resistance Training on Abdominal Strength, Sexual Dysfunction, Pain and Menstrual Parameter in Women Suffering from Primary Dysmenorrhoea: A Case-Control Study

MEENAKSHI<sup>1</sup>, JAGANJYOTI DAS<sup>2</sup>

## ABSTRACT

**Introduction:** Menstruation is the monthly, cyclical, repeated passage of blood from the uterus through the vagina that occurs during the reproductive years. In the absence of pregnancy, menstruation happens when progesterone and estrogen level drop, shedding the accumulation of uterine lining. The typical age of the menarche is still between 12 and 13 old years. Dysmenorrhoea, or problematic menstrual flow, refers to uncomfortable 9 periods. It is among the most prevalent gynaecological conditions, affecting 20-90% of female throughout their reproductive years. A broad range of physical (mental) symptoms are recognised to be a part of dysmenorrhoea syndrome. Research studies indicate a link between physical exercise and dysmenorrhoea. The females who are involved in physical activity are at 3.5 times lower risk of developing dysmenorrhoea. Studies indicate that a 15-minute resistance training session causes the body to produce lactic acid and growth hormones, activating fat metabolism.

**Aim:** To compare the effect of aerobic exercise and resistance training on abdominal strength, sexual dysfunction, pain, and menstrual parameters in women suffering from primary dysmenorrhoea.

**Materials and Methods:** Forty-five subjects with diagnosed dysmenorrhoea after the menarche were allocated to the experimental and control groups (N=45, n=15). Participants of all groups were asked to perform a set of exercises. The intervention of the experimental group consisted of aerobic exercise and resistance training along with stretching and hot packs, whereas the control group was given only stretching exercise and a hot pack. The intervention was prescribed 4 days a week for 6 weeks. All the outcome variables (abdominal strength, sexual dysfunction, pain, and menstrual symptoms) were recorded at baseline and the end of 6 weeks.

**Results:** A statistically significant difference ( $p \leq 0.05$ ) was found in the mean value of pre- and post- values of the experimental groups as well as between the groups. The difference was found to be more than that of the control group in the abdominal strength, sexual dysfunction, pain and menstrual parameters.

**Conclusion:** In this study, it was found that aerobic exercises are more effective in improving sexual dysfunctions, and menstrual parameters, whereas resistance training could improve abdominal strength, as found in the study.

**Keywords:** Lactic acid, Menstrual parameters, Stretching exercise

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# Prevention of Low Back Pain in Sewing Workers - An Integrated Review of Physical Activity, Psychosocial, and Ergonomic Strategies: A Review

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## ABSTRACT

Sewing employees are particularly susceptible to occupational Low Back Pain (LBP) because of their limited biomechanics, repetitive motions, and extended periods of static position. The bio-psycho-social approach emphasises the importance of the significance of psychosocial stressors, while traditional prevention has concentrated on physical aspects.

This review of the literature summarises the most recent research on the causes of LBP in sewing workers and assesses the efficacy of preventative measures that include ergonomics, physical activity, and psychosocial therapies.

A thorough search was carried out using a structured combination of keywords in the main academic databases (PubMed/MEDLINE, Scopus, Web of Science, and CINAHL). Studies that examined LBP risk factors or therapies having particular study categories such as observational studies or clinical trials, and those which concentrated on sewing workers, were all included.

The review finds that psychosocial stresses like high job demands, poor control, and a lack of social support aggravate the physical risk

factors of prolonged sitting and repetitive jobs. Research suggests that the best preventative approach is a comprehensive programme that incorporates: Ergonomic modifications (e.g., adjustable chairs, workstations), structured exercise programmes focusing on core strengthening and stretching, combined with frequent active breaks and psychosocial and organisational interventions such as job redesign, training on stress management, and creating a positive work atmosphere.

For LBP in sewing workers to be effectively prevented, a thorough, bio-psycho-social strategy is required. The most promising way to lower the prevalence and severity of LBP and improve worker well-being and productivity is to combine ergonomic, physical, and psychosocial methods within a collaborative framework. Future initiatives have to concentrate on putting such integrated programmes into practice and assessing their effectiveness in actual industrial contexts.

**Keywords:** Ergonomics, Exercise, Psychosocial factors

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# Prevalence of Chronic Respiratory Diseases Among Adults in Delhi NCR: A Pilot Study

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## ABSTRACT

**Introduction:** Chronic Respiratory Diseases (CRDs) remain a significant contributor to morbidity and reduced quality of life among adults in urban India, especially in heavily polluted metropolitan regions like the Delhi National Capital Region (NCR). Despite increasing awareness, community-level epidemiological data on CRD prevalence in this area is limited.

**Aim:** To determine the prevalence and symptom profile of chronic respiratory diseases among adults in Delhi NCR through validated patient-reported measures in a pilot setting.

**Materials and Methods:** A cross-sectional pilot study was conducted involving 60 adult residents from various localities of Delhi NCR. Participants were screened for diagnosed CRDs and respiratory symptoms. The Chronic Respiratory Questionnaire (CRQ) was administered to evaluate domains of dyspnoea, fatigue, emotional function, and disease mastery, and the Medical Research Council (MRC) dyspnoea scale was used to grade the severity of breathlessness. Demographic details, digital connectivity, and device ownership were also documented. Descriptive statistics were performed to summarise CRQ and MRC scores and to estimate the prevalence and impact of respiratory morbidity.

**Results:** Among the 60 participants, a notable proportion reported doctor-diagnosed CRDs and moderate to severe respiratory symptoms. CRQ scores reflected variable but often moderate impairments across dyspnoea, fatigue, and emotional function domains, with several individuals reporting significant limitations on mastery. MRC grading among affected subjects indicated a spectrum of exertional breathlessness, with the majority experiencing at least minimal activity limitation. High rates of digital literacy and device ownership were also observed, indicating suitability for potential digital health interventions in this population.

**Conclusion:** This pilot analysis highlights an appreciable prevalence and burden of chronic respiratory diseases among adults in Delhi NCR, with marked effects on quality of life and daily functioning. The use of CRQ and MRC enables nuanced detection and quantification of symptom burden in epidemiological research. These findings support the feasibility of larger-scale studies and targeted public health interventions in urban Indian settings.

**Keywords:** Chronic respiratory questionnaire, Medical Research Council dyspnoea scale, Metropolitan regions

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# The Impact of Inspiratory Muscle Training on Musicians: A Comprehensive Review

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## ABSTRACT

Inspiratory Muscle Training (IMT) has demonstrated benefits in diverse populations, particularly in improving respiratory muscle strength, endurance, and overall pulmonary function. For musicians, especially wind and brass instrumentalists and singers, optimal respiratory control is central to performance, yet research on IMT in this group remains limited.

This review synthesises the existing literature on the role of IMT in enhancing respiratory function and performance outcomes in musicians.

We conducted searches across multiple electronic databases like PubMed, Scopus, Web of Science, and the Cochrane Library using Mesh Terms IMT and musicians. The review considered outcomes including inspiratory muscle strength, respiratory endurance, breath control, tone stability, postural support, and perceived performance ease.

Evidence indicates that IMT significantly increases inspiratory muscle strength and endurance. In musicians, these gains have been linked to improved breath control, sustained note production, tone quality, and reductions in performance-related fatigue. Findings from broader non-musician populations support IMT's efficacy in enhancing lung function and postural stability; however, studies directly involving musicians are few, often limited by small sample sizes and methodological heterogeneity.

IMT shows promise as a performance-enhancing and health-promoting strategy for musicians, yet the evidence base is preliminary. Larger, rigorously designed, musician-specific studies are needed to establish the effectiveness and practical applications of IMT in musical training and performance.

**Keywords:** Endurance, Lung functions, Strength

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# Outside the Operating Room - The Efficiency of Physiotherapy for Endometriosis: A Narrative Review

KANGANA JUNEJA KANSAL<sup>1</sup>, DHEERAJ KUMAR<sup>2</sup>, BARNALI BHATTACHARJEE<sup>3</sup>

## ABSTRACT

Endometriosis is a widespread gynaecological condition burdening millions of women globally, with chronic pelvic pain as a primary symptom, followed by dysmenorrhoea, dyspareunia, fatigue, and emotional distress. Confirmation of diagnosis is usually delayed for years, leaving the patient in a stressful stage, both physically as well as emotionally. The pain is often complex and can be an excessive burden on women of reproductive age. It demands a broad-based management in addition to traditional medical and surgical options.

This narrative review aims to consolidate the current literature available one challenges associated with the diagnosis of Endometriosis-

Related Pelvic Pain (ERPP) and to assess the efficiency of women's health physiotherapy as a domain of care.

A review was performed on available literature, focusing on the diagnosis of endometriosis and the effect of physical therapy management, including pelvic floor rehabilitation, manual therapy, and condition-specific exercises to reduce pelvic distress and related musculoskeletal impairment.

The review exhibits that physical therapy is an essential adjunct to the traditional medical and surgical approach. It specifically focusses on pain caused by musculoskeletal dysfunctions, and various modalities are shown to result on significant reduction of pain intensity, which helps to ameliorate sexual dysfunction,

and improves the overall well-being for women suffering from endometriosis. ERPF affects quality of life, sexual functioning and activities of daily living. Combining physical therapy with traditional medical management can complement existing interventions to reduce treatment disparities, enabling a multidimensional and

impactful approach for addressing chronic pelvic pain in females with this condition.

**Keywords:** Chronic pelvic pain, Non-surgical management, Pelvic floor rehabilitation

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# Surface Electromyography as an Assessment Tool to Guide Physiotherapy Protocols in Stroke Rehabilitation: A Narrative Review

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## ABSTRACT

Stroke is a major cause of disability globally, upper extremity motor impairment being more prominent, affecting quality of life and functional independence. Physiotherapy plays a vital role in recovery, but the conventional assessments mostly rely on subjective observations. Surface Electromyography (sEMG), as a non-invasive technique, detects muscle activity and offers real-time insights that can guide and optimise physiotherapy protocols.

This review aimed to elaborate on the clinical applications of sEMG as an assessment tool in physiotherapy for improving motor recovery after stroke and to highlight the need for using sEMG at regular intervals during upper extremity motor recovery physiotherapy protocols, to modify the protocols based on sEMG findings.

The narrative review was carried out by searching major databases (Scopus, PubMed/MEDLINE, Google Scholar and Web of Science) by using keywords. Studies focusing primarily on sEMG as an assessment tool, biofeedback, and personalised rehabilitation was included.

Evidence suggests that sEMG helps in early detection of muscle activity, abnormal synergies and inappropriate co-contractions in

stroke survivors. Integrating sEMG into physiotherapy protocols facilitates tailored interventions, enhances patient engagement through biofeedback and provides quantifiable outcomes. It supports individualised physiotherapy planning and promotes precision rehabilitation. Despite its advantages, it is not being used as it should be in clinical practice. Various challenges such as high equipment cost, errors in electrode placement, limited accessibility and lack of standardised protocols, hinder widespread adoption of sEMG in clinical settings.

sEMG is a valuable adjunct for guiding physiotherapy protocols, enabling personalised rehabilitation and improving motor function after stroke. Its integration into routine clinical practice enables accurate evaluation, guides targeted therapy to enhance motor recovery, reduce disability and improve quality of life. Addressing barriers to its clinical adoption may be advantageous for motor recovery in stroke survivors.

**Keywords:** Biofeedback, Motor recovery, Personalised rehabilitation

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# Evolution of Healthcare - Role of Telerehabilitation and IoT in Robot assisted Knee Replacements: A Narrative Review

DHEERAJ KUMAR<sup>1</sup>, JASMINE KAUR CHAWLA<sup>2</sup>

## ABSTRACT

Health care has evolved over the last decade, diversifying its horizons from in-person rehabilitation care to technology-based tele-rehabilitation facilities. Latest trends like Internet of Things (IoT), sensors and virtual reality have changed the definition of telehealth. This narrative review aims to identify the impact of in-person physiotherapy care and telerehabilitation.

To review recent literature on technological interventions and tools utilised in physiotherapy teleconsultations on effectiveness, patient satisfaction, access, and clinical outcomes.

A narrative review was performed using the Scopus, Elsevier, PubMed, Google Scholar, and Web of Science databases, with a temporal scope extending from 2015 to 2025. Eligibility was restricted to articles that examine technological advancements pertinent to physiotherapy, encompassing not only Artificial Intelligence (AI), but also other modalities employed within teleconsultative settings.

In total, 17 studies qualified for our analysis. The primary technologies employed consisted of video conferencing, wearable sensors, mobile applications, AI, and virtual and augmented reality. The majority of studies found an increase in patient and clinician involvement, compliance with exercise regimens, and clinical results.

Virtual reality, machine learning, and distributed sensor technologies have profoundly enhanced teleconsultation in the field of physiotherapy. When combined, AI-augmented diagnostic instruments, tethered and untethered biofeedback systems, and bidirectional immersive environments have elevated both the efficacy and the responsiveness of remote physiotherapy interventions clinically applied to musculoskeletal, cardiac, and neurological disorder domains.

**Keywords:** Artificial intelligence, Internet of Things, Rehabilitation care

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# Instrumented Gait Assessment for Spinal Cord Injury: A Review of Technology Driven Objective Measures

GARIMA WADHWA<sup>1</sup>, POOJA ANAND<sup>2</sup>, PRIYANKA RISHI<sup>3</sup>

## ABSTRACT

Individuals with Spinal Cord Injuries (SCI) tend to develop slow, inefficient, unbalanced, or uncoordinated gait patterns. Traditional clinical tools, although found to be reliable measure for assessing gait deviations, are subjective and often have inter-rater variability. The technology-driven instrumented gait assessment tools may offer an objective and quantifiable method of assessing gait deviations among individuals with SCI. This review aims to synthesise the current application of objective gait analysis tools to detect gait

abnormalities in individuals with SCI.

A literature search was conducted on PubMed and Scopus databases to identify studies that have assessed the gait of individuals with spinal cord injury using technology-driven tools. Studies were included if they utilised any technology-driven tool, including Inertial Measurement Units (IMU) sensors, wearable sensors, 3D motion kinetic systems, pressure-sensitive platforms, etc., for gait assessment in SCI, either to evaluate reliability/validity or as an outcome measure in randomised controlled trials. Data

extracted included characteristics of participants, features of the tools, gait parameters evaluated, and main study findings.

Our search yielded 1728 articles. The title and abstract screening reduced the number of articles to 22 and finally 10 studies were included for this review based on the eligibility criteria. Most of the studies utilised IMU sensors for the gait evaluation of individuals with SCI, followed by a 3D kinetic motion sensor system. The IMU sensors are a reliable technology-driven objective measures for determining spatiotemporal parameters such as stride length, step length, cadence, and double support time. However, 3D kinetic motion systems allow detailed information on kinematic parameters, including joint range of motion at the hip and knee.

Instrumented gait assessment offers objective and quantifiable insights into locomotor function in individuals with spinal cord injury. Among the available technologies, IMU-based wearable sensors have emerged as the most practical and widely adopted tool due to their portability, ease of use, and ability to capture spatiotemporal parameters in real-world conditions. Meanwhile, 3D motion analysis provides more in-depth biomechanical insights.

**Keywords:** Clinical gait analysis, Motion capture, Mobility evaluation, Objective measures, Technology

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# A Case Study on the Role of Deep Transverse Friction and Splint Therapy in Managing Temporomandibular Joint Dysfunction

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## ABSTRACT

Temporomandibular Joint Dysfunction (TMD) is a common musculoskeletal disorder involving pain, limited jaw movement, and functional impairment affecting the head and neck region. It often presents with symptoms such as headache, muscle twitching, ear fullness, or tinnitus. Physiotherapeutic management plays a vital role in addressing these symptoms, with Deep Transverse Friction (DTF) massage and splint therapy are effective modalities for pain reduction and functional restoration. In this case study, a 28-year-old individual presented with pain during mouth opening and chewing, accompanied by reduced mandibular range of motion persisting for over three months. Following a diagnosis of TMD by a dentist, the patient underwent a combined intervention of DTF applied to the masticatory muscles along with the use of a customised splint. The outcome measures included the Numerical

Pain Rating Scale (NPRS) for pain intensity, mandibular range of motion assessment using a vernier caliper, the Oral Impact Profile Questionnaire, and the Jaw Functional Limitation Scale (JFLS). After the intervention, the patient demonstrated a marked reduction in pain, increased mandibular mobility, and improved quality of life and functional performance. The combined use of DTF and splint therapy exhibited a synergistic effect in enhancing joint function and relieving discomfort. This case emphasises the significance of integrating manual therapy with splint therapy in the conservative management of the TMD. The positive outcomes observed encourage further research through larger clinical trials to substantiate these results and establish evidence-based physiotherapeutic protocols for TMD management.

**Keywords:** Range of motion, Pain management, Physiotherapy

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# Effect of Yoga on Memory and Problem Solving Ability of Haryana State University Players

CHARAN SINGH<sup>1</sup>

## ABSTRACT

This study investigates the impact of yoga on memory and problem-solving abilities among athletes from Haryana State Universities. Recognising the increasing emphasis on mental fitness in sports, the research aims to explore how yoga practices influence cognitive functions critical for athletic performance. A sample of university players engaged in regular yoga sessions was compared to a control group with no yoga intervention. Standardised tests for memory retention and problem-solving skills were administered before and after the yoga training period. Results indicated significant

improvements in both memory and problem-solving abilities among the yoga group, suggesting that the mindfulness and stress-reduction techniques inherent in yoga may enhance cognitive performance. This study highlights the potential of integrating yoga into training regimens for athletes to optimise their mental acuity and competitive edge. Further research is recommended to explore long-term effects and the underlying mechanisms of these cognitive enhancements.

**Keywords:** Sports, Asanas, Yoga, Psychological, Physical, problem-solving ability

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# Quality of Life, Sleep Quality and Academic Performance in Smartphone Addicts and Non-Addicts: A Cross-Sectional Study

RIYA SHARMA<sup>1</sup>, ANKITA SAMUEL<sup>2</sup>, DEEPAK KUMAR<sup>3</sup>, SHWETA KUMAR<sup>4</sup>

## ABSTRACT

**Introduction:** Smartphone addiction, increasingly prevalent among young adults have been implicated in compromised sleep, diminished academic performance, and altered quality of life. Understanding these interrelationships is critical for developing effective health promotion interventions in university populations.

**Aim:** This study aimed to systematically compare the quality of life, sleep quality, and academic performance between smartphone-addicted and non-addicted university students.

**Materials and Methods:** A cross-sectional survey was conducted among 140 randomly selected university students aged 18-25 years in the Delhi NCR region. The Smartphone Addiction Scale-Short Version (SAS-SV) was administered to classify participants as addicts or non-addicts. Sleep quality, health-related quality of life, and academic performance were assessed using the Pittsburgh Sleep Quality Index (PSQI), SF-36 questionnaire, and Academic Performance Rating Scale (APRS), respectively. Data collection

was undertaken via online forms. Pearson's correlation analysis was performed using SPSS version 21.0 to determine associations among variables.

**Results:** A significant negative correlation was observed between smartphone addiction and both sleep quality and academic performance, indicating that higher degrees of addiction were associated with poorer sleep and reduced academic outcomes ( $p < 0.05$ ). However, no significant relationship was identified between smartphone addiction and overall quality of life as measured by the SF-36.

**Conclusion:** Excessive smartphone use adversely impacts sleep and academic achievement, but does not significantly affect quality of life in the studied population. These findings highlight the urgent need for targeted interventions to foster responsible smartphone use among university students.

**Keywords:** Pittsburgh Sleep Quality Index, Smartphone addiction, University students

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# A Preliminary Investigation of MDT Efficacy in Controlled and Uncontrolled Diabetic Frozen Shoulder

SHEENA ARORA<sup>1</sup>, KSHITIJA BANSAL<sup>2</sup>, KHYATEE<sup>3</sup>**ABSTRACT**

**Introduction:** Adhesive Capsulitis (AC) is frequently associated with diabetes mellitus, attributed to increased glycosylation of collagen fibres in the shoulder joint capsule. Exercise-based interventions remain the primary treatment; however, the role of Mechanical Diagnosis and Therapy (MDT) in diabetic AC has not been widely investigated.

**Aim:** To determine the effectiveness of MDT in the assessment and management of AC among patients with controlled and uncontrolled diabetes.

**Materials and Methods:** Patients clinically diagnosed with diabetic AC by a physician or orthopaedician were recruited and allocated into two parallel groups: controlled diabetes (HbA1c <7) and uncontrolled diabetes (HbA1c >7). Participants were assessed using MDT principles and classified into derangement or articular dysfunction syndromes, followed by individualised interventions based on movement responses. Outcome measures included pain (Visual Analogue Scale, VAS), shoulder Range of Motion (ROM), and functional status (Upper Extremity Functional Index, UEFI), assessed at baseline, and at 2, 6, and 10 weeks.

**Results:** Baseline demographics and outcome measures did not significantly differ between groups, except for Glycosylated Haemoglobin (HbA1c), which was significantly higher in the uncontrolled group ( $p < 0.001$ ). Significant time effects were observed for VAS, ROM, and UEFI ( $p \leq 0.002$ ). Group effects were significant for abduction ROM ( $p = 0.013$ ) and UEFI ( $p = 0.025$ ), while no significant time  $\times$  group interaction was found. Post hoc analysis revealed significant improvements between baseline and week 2, and baseline and week 10, for VAS, ROM, and UEFI ( $p \leq 0.05$ ). Additional improvements were noted between weeks 2 and 6 for flexion, external and internal rotation, and UEFI ( $p \leq 0.029$ ), and between weeks 6 and 10 for VAS, flexion, internal rotation, abduction, and UEFI ( $p \leq 0.024$ ).

**Conclusion:** MDT is effective in reducing pain and improving ROM in both controlled and uncontrolled diabetic AC. Functional outcomes, however, improved more significantly in patients with controlled diabetes, highlighting the role of glycaemic status in rehabilitation outcomes.

**Keywords:** Adhesive capsulitis, Diabetes mellitus, Glycaemic control, Mechanical Diagnosis and Therapy, Rehabilitation

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# Impact of Blood Flow Restriction Aerobic Training at 40% and 60% Occlusion Pressure on Body Composition in Sedentary Young Adults: A 4-Week Randomised Pilot Study

TANYA GUJRAL<sup>1</sup>, KAMRAN ALI<sup>2</sup>

## ABSTRACT

**Introduction:** Training with Blood Flow Restriction (BFR) has become a popular way to improve exercise results at lower intensities. The relative effects of various occlusion pressures on body composition in sedentary populations; however, it is not well supported by data.

**Aim:** The purpose of this pilot study was to examine how aerobic exercise with arterial occlusion pressures of 40% and 60% affected the Body Mass Index (BMI) and Waist-Hip Ratio (WHR) of sedentary young adults.

**Materials and Methods:** Using computer-generated randomisation, 30 sedentary young individuals were gathered and divided into two intervention groups. For four weeks, both groups engaged in three sessions of supervised treadmill training using the modified Bruce protocol, along with BFR at 40% or 60% Arterial Occlusion Pressure

(AOP). BMI and the WHR were measured both before and after the intervention.

**Results:** Repeated measures Analysis of Variance (ANOVA) was used in the statistical analysis to evaluate both between-group differences and within-group differences changes over time. Both groups showed changes in the body composition, with WHR and BMI possibly declining more at 40% AOP was higher than at 60% AOP.

**Conclusion:** This pilot investigation will help guide future large-scale clinical trials by offering initial data on the ideal occlusion pressure for BFR aerobic exercise to change body composition in inactive young adults.

**Keywords:** Blood flow restriction therapy, Body mass index, Exercise, Sedentary Behaviour, Waist-Hip Ratio

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# Exercise Induced Changes in Testosterone: A Systematic Review of Different Exercise Methods

HIMANSHU<sup>1</sup>, AMIT SARAF<sup>2</sup>, POOJA ANAND<sup>3</sup>, HIMANSHU GAKHAR<sup>4</sup>

## ABSTRACT

**Introduction:** Testosterone marked as a performance pointer so it has become crucial to look towards the physiological measures with physical outcomes. Diverse influence of testosterone and other hormones from the existing literatures marks it perfect that variability arises from the exercise either to lower or higher adjacent. The adaptations observed in notable studies are variable and dictating the part to detect further because of its lower side by some trainings. Tapering shows its own impact among athletes and ordinary population and makes clear that

the variability arises from different levels of trainings and their specificity.

**Aim:** This systematic review aimed to discover a cumulative impact of various trainings or exercise methods on the biochemical levels of testosterone.

**Material and Methods:** Various studies were collected from different databases and their engagement was done according to titles and their respective data with registering on review portal (PROSPERO). Various quality assessment tools were used i.e. Cochrane risk of bias II and PeDRo scale for minimising the

inaccuracies and appropriate estimates of data. PICO framework was used to incorporating the studies in analysis and PRISMA approach was used for inclusion.

**Results:** According to studies searched and included in review, the observation of studies was that there was a significant rise in testosterone, cortisol and other physical measures. Variability was observed in tapering type of training because they were also showing deterioration. Maximum studies favors the risen level of

testosterone and significance was observed below the value of ( $p < 0.005$ ). Cortisol value were variable among the older and female population incorporated by researchers.

**Conclusion:** The suggested data concluded that the changes in values of various biochemical markers i.e. testosterone, cortisol, and other hormones shows a significant variability in different exercise conventions.

**Keywords:** Hormones, Training, Tapering

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# Impact of an Artificial Intelligence Based Application Intervention on Emotional Intelligence and Hedonic Tone Among University Level Female Basketball Players: A Pilot Study

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## ABSTRACT

**Introduction:** Female varsity basketball players experience increased academic and athletic expectations that might erode resilience, emotional regulation, and overall well-being. Hedonic Tone (HT) and Emotional Intelligence (EI) are critical to the psychological health and performance of athletes. Enhancing EI and HT in supporting performance and mental health. Applications of Artificial Intelligence (AI) are a promising route for boosting these psychological assets through systematic, technology-based interventions in sports environments.

**Aim:** The pilot study tested the impact of an AI-supported application intervention on EI and HT in university-level female basketball players.

**Materials and Methods:** Twenty women basketball players (18-23 years) from a sports university participated voluntarily. A 6-week mobile application programme using AI was implemented with daily modules on recognising emotions, regulating emotions, perceiving others' emotions, and empathy. The Emotional Intelligence Scale

and the Snaith Hamilton Pleasure Scale were applied to measure HT. Pre- and post-intervention outcomes were compared using paired-samples t-tests.

**Results:** The intervention yielded notable gains in EI  $p=0.040$  ( $<0.05$ ) from pre to post, and also statistical significance:  $p=0.006$  ( $<0.05$ ) shows a statistically significant gain in Hedonic tone from pre to post. In the post-intervention, the participants showed notable gains on emotional intelligence scores and self-rated increased positive hedonic tone. The AI application was acceptable, showing good adherence and usability.

**Conclusion:** The results indicate that AI-powered psychological training programmes can significantly boost EI, and HT in female university basketball players. These initial findings add strength to the notion of incorporating AI tools into sport psychology interventions among athletic population, making it a subject of further inquiry with larger sample and follow-up.

**Keywords:** Artificial intelligence, Female athlete, Psychological intervention

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# Examining the Relationship between Adherence to Pelvic Floor Rehabilitation and Improvements in Mental Health Outcomes: A Systematic Review

YUKTI GOGIA<sup>1</sup>, PRIYANKA RISHI<sup>2</sup>, KALPANA<sup>3</sup>

## ABSTRACT

**Introduction:** Vulvovaginal Atrophy (VVA), a key component of genitourinary syndrome of menopause, significantly impairs sexual function, urinary health, and quality of life in postmenopausal women. While pharmacological therapies such as topical oestrogen are widely used, non-hormonal interventions are increasingly important. Pelvic Floor Rehabilitation (PFR) and Cognitive-Behavioural Therapy (CBT) have individually shown benefits in improving urogenital symptoms and psychological outcomes. However, the combined effect of these interventions remains unclear.

**Aim:** To systematically review and synthesise the evidence on the effectiveness of combined PFR and CBT compared to usual care, PFR alone, CBT alone, or other interventions in postmenopausal women with VVA.

**Materials and Methods:** A comprehensive search was conducted in MEDLINE, Embase, Cochrane CENTRAL, CINAHL, PsycINFO, and Web of Science, as well as ClinicalTrials.gov and WHO ICTRP. Randomised controlled trials and controlled studies will be eligible. Two independent reviewers screened studies, extracted data,

and assessed risk of bias using RoB 2 (RCTs) or ROBINS-I (non-randomised studies). The primary outcomes include VVA symptom severity and sexual function. Secondary outcomes include pelvic floor muscle strength, quality of life, depression, and anxiety. Data was synthesised narratively; meta-analysis was performed where  $\geq 2$  comparable trials exist. PRISMA 2020 guidelines were followed.

**Results:** Forty articles met the inclusion criteria. The majority of the studies included physiotherapy interventions such as PFR, CBT in treating postmenopausal women with vulvovaginal atrophy. Exercises, counselling as well as physical therapy are effective to improve vulvovaginal atrophy symptoms and vaginal muscle strength.

**Conclusion:** This systematic review provides consolidated evidence on whether integrating PFR with CBT improves physical and psychological outcomes in postmenopausal women with VVA, informing future rehabilitation strategies and clinical practice.

**Keywords:** Anxiety, Community behavioural therapy, Depression, Health-related quality of life, Physiotherapy intervention, Psychological health, Vulvovaginal atrophy

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# Effectiveness of Different types of Kinesio Taping Application on Calf Muscle Fatigue in Healthy Collegiate Athletes: An Experimental Study

DEEPAK TYAGI<sup>1</sup>, VINAY KUMAR SINGH<sup>2</sup>, AJEET KUMAR SAHARAN<sup>3</sup>, CS RAM<sup>4</sup>

## ABSTRACT

**Introduction:** Fatigue is a highly common phenomenon among athletes in life and sports. It results in decreased muscle strength, pain, decreased range of motion, balance, and agility and increased risk of injury, which ultimately results in decreased sports performance of the athlete. Many studies have examined

the effects of Kinesio Taping (KT) on muscle fatigue. However, the effect of different types of application of KT has been rarely reported.

**Aim:** This study aimed to fill this research gap by examining the effects of different types of applications of KT on muscle fatigue.

**Materials and Methods:** A three-arm parallel pretest-post-test experimental design was used. Forty-five collegiate athletes were randomly assigned to three groups. Group A received Y shaped application of KT, Group B received I shaped application of KT and Group C was the control group without KT. The number of heel rises was measured before and after taping in all the groups, using a habermeter and metronome. The taping was done following the principles of kenso kaze.

**Results:** Group A (Y-shaped) number of heel rises significantly increased 18.76% (p-.001) after applying KT. Group B (I-shaped) results shows non-significant effect on heel rises(p-.136).

**Conclusion:** Y-shaped application of KT over the calf muscle is effective in reducing fatigue.

**Keywords:** Agility, Balance, Heel-rise test

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