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International Conference-2025

" Innovations in Biomechanics and Footwear Development: Shaping the Future of Movement "

Date: 21st & 22nd February 2025

Host Institution – Galgotias University

Galgotias University, Uttar Pradesh, sponsored by Smt. Shakuntala Educational and Welfare Society, has achieved NAAC A+ accreditation in its first cycle with a score of 3.37/4, making it one of the top private universities and a highly graded autonomous institute by the UGC, Ministry of Education, India.

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FDDI, established in 1986 under the Ministry of Commerce & Industry, is an "Institution of National Importance" status under the FDDI Act 2017 with CoEs in Noida, Chennai, Hyderabad, Rohtak, Jodhpur, Patna, and Kolkata for footwear R&D and focusing on research, development, and innovation in manufacturing occupational, safety, and sports footwear.

UNIVERSITY OF CYBERJAYA

We are pleased to announce that Galgotias University, in collaboration with the Centre of Excellence (CoE), Footwear Design & Development Institute, Govt. of India, is organizing the International Conference-2025 on 21st-22nd February. This event will explore the intersection of technology, design, and biomechanics, focusing on innovations in footwear for sports, healthcare, and daily use. We invite you to join us!

Organizing Chairperson
Dr. Madhusudan Pal,
Scientist-G & Director
Centre of Excellence, FDDI,
Govt. of India, Noida
Contact no. 9868200857

Organizing Secretary
Prof. (Dr.) Shagun Agarwal, Dean
School of Allied Health Sciences
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Message from Suneel Galgotia, Chancellor, Galgotias University:

It gives me immense pleasure to extend my warm greetings and best wishes to all the distinguished delegates, researchers, academicians, and industry experts participating in the International Conference on “Innovations in Biomechanics and Footwear Development: Shaping the Future of Movement”, being hosted by Galgotias University in collaboration with the Centre of Excellence, FDDI.

At Galgotias University, we have always believed in fostering innovation, research excellence, and meaningful industry–academia partnerships. This conference stands as a testimony to our unwavering commitment towards advancing knowledge, promoting interdisciplinary collaboration, and addressing real-world challenges in healthcare, sports, and everyday life through biomechanics and footwear innovations.

I am confident that the deliberations, presentations, and exchange of ideas during this conference will open new avenues for research and development, inspire young minds, and contribute significantly to the future of human movement science.

I extend my heartfelt gratitude to all organizers, collaborators, and participants for their valuable contributions in making this academic endeavor a reality. I wish the conference grand success and hope it sets a new benchmark for future scholarly engagements.

Message from Dr. K. Mallikharjuna Babu, Vice Chancellor, Galgotias University:

It is with great pleasure that I inaugurate the National Conference 2025. The focus on biomechanics and footwear development is timely and relevant, given the increasing importance of these areas in sports, healthcare, and everyday life. This conference offers a unique opportunity to explore the latest advancements, address key challenges, and forge partnerships that will accelerate progress. I am confident that the insights shared here will have a lasting impact on the field.

Message from Prof. (Dr.) Avadhesh Kumar, Pro Vice Chancellor, Galgotias University:

Welcome to the National Conference 2025! This conference, a collaborative effort between Galgotias University's School of Allied Health Sciences and the FDDI Centre of Excellence, highlights the synergy between academia and industry in driving innovation. The diverse range of topics covered, from biomechanical analysis to advanced footwear materials, promises to generate lively discussions and inspire new research directions. I encourage all participants to actively engage and contribute to the success of this important event.

Message from Dr. Nitin Kumar Gaur, Registrar, Galgotias University:

On behalf of Galgotias University, I extend a warm welcome to all participants of the National Conference 2025. We are honored to host this distinguished gathering of experts in biomechanics and footwear development. The conference provides a valuable platform for knowledge exchange, networking, and the exploration of emerging trends. We believe that the collaborations fostered here will lead to significant advancements in the field and ultimately benefit society.

Message from Dr. Madhusudan Pal, Scientist-G & Director, Centre of Excellence, Footwear Design and Development Institute, India (Organizing Chairperson):

It is with immense pleasure that I welcome you to the National Conference 2025 on "Innovations in Biomechanics and Footwear Development: Shaping the Future of Movement". This conference, a collaborative endeavor between the FDDI Centre of Excellence and Galgotias University, represents a significant step towards bridging the gap between research and practical application in the field of biomechanics and footwear. We are particularly excited to bring together leading experts, researchers, and industry professionals to explore the latest advancements, discuss emerging trends, and foster collaborations that will drive innovation and shape the future of the movement. I am confident that this conference will be a valuable platform for knowledge exchange and networking, and I look forward to a stimulating and productive event.

Message from Prof. (Dr.) Shagun Agarwal, Dean, School of Allied Health Sciences, Galgotias University (Organizing Secretary):

As Dean of the School of Allied Health Sciences at Galgotias University, I am delighted to welcome all participants to the National Conference 2025. This conference, organized in partnership with the FDDI Centre of Excellence, aligns perfectly with our mission to promote excellence in research and education in the allied health sciences. The focus on biomechanics and footwear development is crucial, as these fields play a vital role in enhancing human performance, preventing injuries, and improving quality of life. I am confident that the conference will provide a valuable forum for sharing cutting-edge research, discussing best practices, and inspiring new ideas. I wish all attendees a fruitful and enriching experience.

Abstract-1

Role of Modelling and Simulation in Robotics and Biomechanics

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Prof. Subir Kumar Saha will first introduce Robotics and Cobotics research/entrepreneurship at IIT Delhi. Then, he will introduce his DeNOC-based recursive efficient and realistic modelling for the simulation of walking robots, which can play an important role in biomechanics. Some innovation related to footwear design will also be showcased.

Abstract-2

Capturing and Protecting Intellectual Property Rights: Role of Patent Information and Prior Art Search For Determining Novelty and Inventive Step

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An invention shall have novelty, inventive step, and industrial applicability to get a patent granted. A patent is granted to the inventor only if these three conditions are fulfilled. The way to assess the patentability of the invention before filing a patent application is by performing a patentability search. A patentability search is a comprehensive investigation conducted to determine the potential patentability of an invention. It involves searching existing patents, publications, and other sources to assess if the invention meets the criteria of novelty, non obviousness, and industrial applicability. It helps evaluate the chances of obtaining a patent and it saves costs by avoiding the filing of fruitless patent applications. A prior art search is conducted to find any prior art in a technical field of interest. This is usually of interest for checking if a technical idea is novel. For example, either prior to an already filed patent application or to check if a pending or granted patent is valid.Prior art search aims to clarify whether claims defining a new invention are novel from the perspective of prior art.

Keywords: Claims, Non-obviousness, Patentability

Abstract-3

The History and Future of Combat Foot Wear

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Ever since the 18th Century BC to the 21st Century AD, combat footwear has seen constant evolution based on operational requirements, material development, and manufacturing technologies. From the Caligae that used hobnails for traction to the era of Vibram soles for traction on ice and snow, the combat boots have been an interesting case study for synergy in footwear development and battle tactics. With the current military footwear being designed around the classic Combat Boot, there have been considerable indigenous developments with respect to the comfort and performance of these shoes. Department of Defense Institute of Physiology and Allied Sciences (DIPAS) has developed combat boots for all-weather operations with high anti-penetration, better traction, balanced breathability, and reduced ground reaction forces. However, with the advent of advanced technologies and the need for footwear to be performance assistive devices, there is a scope for improvising combat boots to functional footwear involving futuristic mechanical designs and catering to diverse operational requirements.

Abstract-4

Challenges in Footwear Design Innovations and Manufacturing

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The footwear industry is a major sector in the global economy, producing trillions of pairs each year. However, it faces challenges that impact fitment, mobility, walking efficiency, comfort, quality, and sustainability. One key issue is the precision and indigenous availability of tools like lasts, moulds, and dye, which are crucial for manufacturing footwear. Random size distribution, foot types, and shapes of different ethnicities further complicate the creation of standardised moulds and lasts, leading to suboptimal fit, altered walking foot biomechanics, and discomfort, causing the risk of injuries like slips, trips, and falls. Current/Traditional manufacturing methods lack biomechanical test protocol (standard) and often fail to accommodate/properly fit the diverse types, shapes, and sizes of feet and evaluation of biomechanical responses for objective comfort assessment.

Advanced manufacturing technologies are transforming the footwear industry by improving efficiency and customisation. Three-dimensional (3D) printing enables rapid prototyping and tailored components, while Computer Aided Design (CAD) software allows for precise digital designs. Available advanced technologies can help to design and develop indigenous tools (lasts, moulds, and dye) as per foot types and new designs to improve fitment, and comfort and reduce cost vis-a-vis reducing the risk of injuries by developing digital foot models of the Indian population. Overall, academicians, researchers, and the footwear industry must navigate these mechanical and technological hurdles for designing and developing footwear as per foot dimensions of the diversified Indian population.

Keywords: Ergonomics protocol, Lasts, Moulds, Tools

Abstract-5

Localising Innovation: Transforming India's Footwear Industry Through Indigenous Mould Development

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India's footwear industry, despite its significant potential, heavily relies on imports for crucial components like design, prototyping, and mold-making. This lecture analyses the diverse footwear categories and their applications, emphasising the vital role of lasts and moulds in manufacturing. The current market size, estimated at ₹90,000 crores ($11 billion) with an 8-10% CAGR, reveals a paradox: while India is the second-largest footwear producer, it imports 70-80% of its moulds, primarily from China, Vietnam, and Italy. This import dependence leads to high costs (₹50,000 – ₹3,00,000 per mold), long lead times (4-6 weeks), and stifles innovation.

While domestic last and mold manufacturers exist in Agra, Chennai, and Noida, they face challenges in achieving the precision and quality of imported counterparts, hindered by a lack of advanced Computer Numerical Control (CNC) machinery and high-quality raw materials. Although Indian-made tools can be cheaper (e.g., PU sole moulds are 40% cheaper), the overall ecosystem needs strengthening. Several key roadblocks impede indigenous development: a technology gap, a shortage of skilled mold makers and designers, limited access to high-quality raw materials, insufficient R&D investment, cost competitiveness challenges, and supply chain bottlenecks.

To address these issues, a multi-pronged strategy is crucial. This includes skill development programs in collaboration with technical institutes, investments in advanced CNC machining and automation, strengthening the raw material supply chain, and government support through policy reforms like import tariffs and incentives for local startups. Furthermore, fostering local R&D and innovation through research hubs and collaboration between manufacturers and designers is essential. Companies like Allure Enterprises are leading the charge, specialising in prototyping, mold-making, and design localisation, working with major brands to reduce import dependency. Ultimately, by focussing on these strategies, India can transform its footwear industry, shifting from import reliance to becoming a globally competitive manufacturing powerhouse.

Keywords: Design, Mould-making, Precision, Prototyping.

Abstract-6

Comparative Analysis of Peak Ground Reaction Forces among Various Types of Sports Footwear During Walking: A Pilot Study

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ABSTRACT

Introduction: The interaction between the human foot and the ground is vital in athletic activities. Peak Ground Reaction Force (PGRF) is a key measure, representing the maximum force exerted by the ground on the foot during contact. These forces indicate a shoe's biomechanical performance and its impact on the musculoskeletal system. Selecting the right sports footwear is essential for preventing injuries and improving performance.

Aim: This study's objective was to conduct a comparative kinetic analysis of PGRFs resulting from the use of different types of sports footwear during walking.

Materials and Methods: A total of 30 PGRFs (10 PGRF of gait cycles of each brand) were selected in healthy volunteers during 10 minutes of uninterrupted level walking. Ground reaction forces were recorded using foot-insole sensors on three sports footwear brands: Brand 1 with 'Cloud-Tec' midsoles, Brand 2 with 'IGNITE' or 'PROFOAM' midsoles, and Brand 3 with 'PU' or 'EVA' materials. The outsoles featured Cloud-Tec, Grip-Zone, and rubber for Brands 1, 2, and 3, respectively. Data were collected at a sampling rate of 50 Hz, and statistical analysis was performed to compare PGRFs among the brands.

Results: The analysis revealed significant differences in PGRFs across the three brands ($p<0.05$). Notably, Brand 2 demonstrated superior impact absorption capacity, showing significantly lower PGRFs compared to Brands 1 and 3. Specifically, the average PGRFs for Brand 2 were 14.19% (left) and 14.28% (right) lower than those recorded for Brand 1 and 56.04% (left) and 30.49% (right) lower than Brand 3.

Conclusion: The findings of this study indicate that the enhanced impact absorption capability of Brand 2 may be due to its better midsole design, which utilises advanced cushioning materials and a carefully engineered sole structure. This highlights the importance of choosing sports footwear with effective impact absorption properties to reduce stress on the lower extremities during walking. These results are particularly significant for athletes, recreational walkers, and individuals with musculoskeletal conditions who are looking for footwear that can help lessen impact forces.

Keywords: Footwear design, Impact force absorption, Midsole material

Abstract-7

Exploring the Determinants of Sarcopenia: A Narrative Review on Risk Factors

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ABSTRACT

Introduction: Sarcopenia, a condition characterised by the progressive decline in skeletal muscle mass, strength, and function, significantly impacts frailty, disability, and quality of life in ageing populations. While traditionally associated with older adults, recent research suggests that a complex interplay of factors contributes to its development and progression.

Aim: This narrative review aims to provide a comprehensive analysis of sarcopenia risk factors, exploring the interactions between chronic diseases, inflammation, physical inactivity, nutritional deficiencies, and psychosocial determinants.

Materials and Methods: The review methodology involved a literature search using major databases such as PubMed, Scopus, and Google Scholar to identify relevant studies on sarcopenia risk factors. The findings synthesise evidence from epidemiological, clinical, and mechanistic studies to present an integrative perspective.

Results: The review revealed that sarcopenia is influenced by a wide range of factors, including chronic diseases (diabetes) and lifestyle choices (sedentary behaviour). Recent research has also identified novel contributors, such as gut microbiome alterations and circadian rhythm disruptions, further expanding our understanding of sarcopenia's pathogenesis.

Conclusion: Sarcopenia is a multifactorial disorder that goes beyond normal ageing and is impacted by a complex interplay of biological, behavioural, and environmental variables. The start and progression of sarcopenia are accelerated by physical inactivity,

poor nutrition, inflammation, metabolic disorders, and psychosocial variables, but ageing, hormonal decline, and chronic diseases are major contributors to muscle loss. We can increase muscle strength, improve physical function, and encourage longevity and general well-being in all age groups by addressing the modifiable risk factors of sarcopenia, especially through focussed exercise programmes and optimum nutrition.

Keywords: Ageing, Biomarkers, Chronic disease, Inflammation, Muscle loss, Nutrition, Physical inactivity

Abstract-8

Modelling And Simulation of Shape Memory Alloy Microactuator for Bionic Applications: A Behavioural Study

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ABSTRACT

Introduction: NiTiNOL is an alloy that has Nickel (Ni) -45% and Titanium (Ti) -55%.The elastic behaviour of a Shape Memory Alloy (SMA) has its deformation characteristics at austenitic and martensitic states. The deformation takes place at the time of temperature variation imposed. By creating a thermal environment, the temperature variation occurs in the SMA wire. SMAs are widely used in industrial, medical, and robotics for their flexibility, minimal weight, differential elasticity, and phase reformation behaviour in thermal environments.

Aim: This research aims to model and simulate a micro SMA actuator providing actuation in grasp assistive devices for elderly people, rehabilitation devices with controlled motion, and grip enhancement.

Materials and Methods: Behavioural study of SMA wire is analysed by the COMSOL multiphysics software. Electrical excitation is used to attain the deformation temperature of SMA wire.Joule heating is the technique used to create a thermal environment.

Results: The modelled SMA wire with a dimension of 0.375 mm diameter, and 50 mm length is simulated in the temperature range of 40°C to 65°C. The simulation produces an actuating force of 9.31N and, a displacement of 20.3 mm.

Conclusion: The simulation results have been used to develop a soft robot for clinical purposes and bionic applications. The resistance of the SMA can reflect the phase transition and can be used for displacement and force prediction, as well as for object stiffness prediction. SMA actuators exhibit high strain, high power-to-weight ratio, and self-sensing ability, which are promising characteristics for application development.

Keywords: Biomechanical system, Joule heating, Pulse width modulation

Abstract-9

Exploring the Potential of Combined Aerobic and Spinal Training in Modulating Neuro-Inflammation in Smokers: A Scoping Review

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ABSTRACT

Introduction: Cigarette smoking induces chronic neuro-inflammation through multiple pathways, contributing to various health complications. While exercise interventions have shown promise in modulating inflammatory responses, the combined effects of aerobic and spinal training on neuro-inflammatory markers in young smokers remain largely unexplored.

Aim: This narrative review aimed to synthesise and analyse current evidence regarding the modulatory effects of combined aerobic and spinal training protocols on neuro-inflammatory pathways among young smokers, with particular emphasis on the underlying mechanisms and therapeutic implications.

Materials and Methods: We conducted a comprehensive literature search across major databases (PubMed, EMBASE, Web of Science, and Scopus) from inception to January 2025. The review encompassed studies examining neuro-inflammatory markers, exercise interventions, and smoking-related inflammation, focussing on the integration of aerobic and spinal training protocols.

Results: Emerging evidence suggests that combined aerobic and spinal training interventions may synergistically modulate key neuro-inflammatory markers, including reduced levels of pro-inflammatory cytokines {Interleukin (IL)-6, Tumour Necrosis Factor-alpha (TNF-α) and (IL-1β)} and enhanced anti-inflammatory mediators (IL-10 and adiponectin). The dual intervention approach appears to influence multiple pathways, including Nuclear Factor-Kappa B (NF-κB) signalling, microglial activation, and blood-brain barrier integrity. Additionally, the combination therapy shows potential in mitigating oxidative stress and promoting neuroplasticity through enhanced Brain-Derived Neutrotrophic Factor (BDNF) expression.

Conclusion: The integration of aerobic and spinal training presents a promising therapeutic approach for manageing smoking-induced neuro-inflammation in young individuals. This review highlights the potential mechanisms underlying the combined intervention's effectiveness and identifies areas requiring further investigation. Understanding these pathways may inform the development of more targeted exercise protocols for young smokers.

Keywords: Aerobic exercise, Combined intervention, Cytokines, Inflammatory markers, Neuro-inflammation, Smoking, Spinal training, Young adults

Abstract-10

Next-Generation Footwear for Diabetic Neuropathy: A Narrative Review on Biomechanical Innovations and Smart Technologies for Ulcer Prevention

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ABSTRACT

Diabetic neuropathy significantly alters foot biomechanics, leading to abnormal pressure distribution, impaired gait patterns, and a heightened risk of foot ulcers, which often precede lower-limb amputation. Altered foot biomechanics and abnormal biomechanical forces, such as excessive pressure, shear stress, or irregular weight distribution, can lead to tissue breakdown and ulcer formation in diabetic patients. Traditional diabetic footwear focusses on static

pressure relief but lacks real-time adaptability to biomechanical changes. Recent advancements in smart sensor technology, Artificial Intelligence (AI), and 3D printing offer a dynamic approach to ulcer prevention and mobility enhancement.

This narrative review explores emerging innovations in diabetic footwear that integrate biomechanical adaptations and smart technologies to optimise pressure redistribution, improve gait stability, and reduce ulcer risk in individuals with diabetic neuropathy.

A comprehensive literature review was conducted on PubMed, SCOPUS, Web of Science, and PEDro. Studies published between 2010 and 2025 were included to ensure the inclusion of recent advancements. Studies focussing on pressure-sensing insoles, AI-assisted gait analysis, thermal ulcer detection, and 3D-printed orthotics were analysed. The impact of these technologies on plantar pressure offloading, gait mechanics, and ulcer prevention was evaluated.

Recent findings indicate that smart footwear incorporating pressure sensors can reduce peak plantar pressures by up to 35%, significantly lowering the risk of ulcer formation. AI-driven wearable technology enables early detection of abnormal gait patterns, allowing for real-time interventions that help prevent diabetic foot complications. Additionally, 3D-printed footwear offers personalised pressure redistribution, surpassing traditional diabetic shoes in providing custom foot support. Integrating biomechanical principles with sensor technology has shown the potential to improve mobility and foot health in diabetic patients.

Next-generation diabetic footwear incorporating biomechanics, smart sensors, and AI-driven technology presents a promising clinical solution for ulcer prevention and mobility enhancement. These innovations can contribute to reducing ulcer recurrence, improving gait stability, and enhancing the quality of life for individuals with diabetic neuropathy. Future research should focus on large-scale clinical trials, cost-effectiveness, practical implementation, and socioeconomic disparities to ensure widespread accessibility in diabetic foot care.

Keywords: Adaptive technology, Biomechanics, Gait analysis, Pressure offloading, Smart footwear, Ulcer prevention, 3D-printed orthotics

Abstract-11

The Power of Emotional Intelligence: Fostering Workplace Success

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ABSTRACT

Introduction: Emotional intelligence (EI) plays a pivotal role in enhancing quality healthcare delivery within official healthcare settings. Its multivariate functioning influences clinical leadership, team dynamics, workplace performance, and the delivery of patient-centric care. Growing evidence underscores EI as a strategic asset in the healthcare sector, particularly when aligned with neurophysiological mechanisms and practical leadership roles.

Methodology: This review incorporated a diverse selection of studies, emphasizing those with strong quantitative design or practical relevance to healthcare. Inclusion criteria were limited to publications from 1998 to 2014 and comprised systematic reviews, observational studies, Level II and III peer-reviewed research, and literature from organizational psychology. Databases searched included PubMed, Google Scholar, Research-Gate, PsycINFO, and Scopus. Over 30 articles were critically analyzed using thematic and evidence-based synthesis.

Results: Key themes emerged, including the neurological basis of EI, its application in patient care, and its role in leadership and team cohesion. Findings demonstrated that emotionally intelligent behaviors are significantly linked to improved patient satisfaction, enhanced staff resilience, and more efficient healthcare delivery. Tools like the Emotional and Social Competency Inventory (ESCI) and structured EI training programs were highlighted as effective in fostering these competencies.

Conclusion: This review supports the assertion that EI is a developable skill with measurable benefits across healthcare settings. Integrating EI into clinician training, leadership development, and organizational frameworks holds potential for improved outcomes for both healthcare professionals and patients.

Keywords: Emotional Intelligence, Competency, Workplace success, Leadership skills

Abstract-12

Reliability of the Delsys Trigno Wireless EMG System During Functional Exercises

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ABSTRACT

Introduction: Electromyography (EMG) is an important tool for evaluating muscle activity during functional movements. The Delsys Trigno wireless EMG system offers promise in this regard, but its reliability during dynamic activities needs evaluation.

Aim: This study aimed to determine the intra-session and inter-session reliability of the Delsys Trigno system during prone rows, prone hip extensions, and bird dog exercises, focusing on the latissimus dorsi and gluteus maximus muscles.

Materials and Methods: Ten healthy participants (age range: 20-30 years) performed three repetitions of each exercise (prone rows, prone hip extensions, and bird dog) on two separate days, one week apart. Surface EMG data were collected from the latissimus dorsi and gluteus maximus muscles using the Delsys Trigno wireless system. For each repetition, the root mean square (RMS) values of the EMG signals were calculated and then adjusted relative to the highest RMS value recorded during the first session. To evaluate how consistent the measurements were within the same session (intra-session reliability), we used the intra-class correlation coefficient (ICC) for each exercise and muscle. We also used ICCs to assess how reliable the results were between the two testing sessions (inter-session reliability).

Results: Intra-session reliability demonstrated excellent to good reliability for all exercises and muscles, with ICC values ranging from 0.85 to 0.92. Inter-session reliability also showed good reliability, with ICC values ranging from 0.75 to 0.90. The latissimus dorsi during prone rows and the gluteus maximus during prone hip extension showed the highest inter-session reliability.

Conclusion: The Delsys Trigno wireless EMG system demonstrated acceptable intra-session and inter-session reliability for assessing muscle activity during prone rows, prone hip extensions, and bird dog exercises. These findings suggest that the Delsys Trigno system is a reliable tool for researchers and clinicians to assess muscle activation patterns during these functional movements. However, variations in inter-session reliability suggest that careful standardization of electrode placement and exercise execution is crucial for minimizing variability.

Keywords: Muscle activation, Posterior Oblique Sling, Gluteus Maximus, Latissimus Dorsi.

Abstract-13

Innovations in Biomechanics And Footwear Developmentfor Advancing Performance and Future Comfort: A Mixed-methods Study

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ABSTRACT

Introduction: Footwear plays a critical role in human movement, influencing biomechanics, comfort, and injury prevention. Traditional footwear design relied on trial-and-error methods, but modern advancements leverage biomechanics for improved functionality. Innovations such as pressure-sensitive materials, motion capture analysis, and Artificial Intelligence (AI)-driven customisation have led to performance-oriented, ergonomic designs. This study examines the latest developments in biomechanics-driven footwear and their impact on athletes, individuals with orthopaedic conditions, and the general population.

Aim: The primary objective is to explore how biomechanical technologies enhance movement efficiency, reduce injury risks, and improve user comfort, while also investigating the role of smart materials, AI, and digital design tools in shaping next-generation footwear.

Materials and Methods: This research employs a mixed-method approach, including a literature review of recent studies, case studies of leading footwear brands and research institutions, experimental analysis of new materials such as smart insoles and adaptive cushioning, and surveys and interviews with athletes, medical experts, and footwear designers.

Results: The findings indicate that biomechanical innovations significantly enhance comfort through pressure distribution and shock absorption, improve athletic performance via energy return and motion efficiency, and prevent injuries by optimising foot alignment and gait mechanics. Additionally, AI-driven customisation ensures a personalised fit and better support.

Conclusion: Advancements in biomechanics are reshaping footwear development through data-driven design, smart materials, and AI-powered solutions. These innovations improve movement efficiency, enhance user experience, and reduce injury risks. Future research should focus on refining these technologies for broader accessibility and sustainability. The fusion of biomechanics and footwear development marks a transformative shift toward smarter, more adaptive footwear solutions.

Keywords: AI-driven Customisation, Biomechanics in Footwear, Ergonomic Shoe Design, Footwear Innovation, Gait Analysis Technology

Abstract-14

Emotional Intelligence as the Key to Moderating Workplace Dynamics: A Scoping Review

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ABSTRACT

Introduction: Emotional Intelligence (EI) is increasingly recognised as a pivotal factor in moderating workplace dynamics, influencing not only individual performance but also organisational culture and productivity. The role of EI in fostering a harmonious and efficient work environment. By encompassing self-awareness, self-regulation, motivation, empathy, and social skills, EI equips employees and leaders with the tools to navigate complex interpersonal interactions and manage stress effectively.

Aim: This literature review explores the role of EI in workplace

dynamics, emphasising its impact on individual performance, organisational culture, and overall productivity. It aims to assess how EI contributes to effective leadership, communication, conflict resolution, and employee engagement while highlighting the significance of EI training in fostering a positive work environment.

Materials and Methods: A comprehensive review of existing empirical studies, theoretical frameworks, and organisational case studies was conducted by using the following databases: Google Scholar and PubMed to examine the relationship between EI and workplace outcomes. The articles published between 2020 and 2024 were included in this present review. Scholarly articles, psychological research, and business reports were analysed to identify key themes, trends, and evidence supporting the integration of EI into professional settings. The articles which are not published in English and papers before 2020 were excluded.

Results: Findings indicate that higher levels of EI correlate with improved communication, stronger teamwork, and enhanced leadership effectiveness. Organisations that prioritise EI development experience lower turnover rates, increased job satisfaction, and higher productivity. Research also suggests that EI training programmes positively influence workplace morale, adaptability, and employee resilience in high-pressure environments.

Conclusion: EI plays a critical role in shaping workplace interactions and overall organisational success. By fostering self-awareness, empathy, and effective interpersonal skills, EI enhances both individual and collective performance. Investing in EI development through structured training programmes can lead to a more cohesive, adaptable, and high-performing workforce, making it an essential component of modern organisational strategies.

Keywords: Empathy, Job satisfaction, Organisational culture, Self-control, Social skills

Abstract-15

Effect of PosturePals® on Pain, Craniovertebral Angle and Quality of Life in 29-Year-Old Office Worker with Cervicothoracic Pain Syndrome: A Case Study

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ABSTRACT

Introduction: Cervicothoracic Pain Syndrome (CTPS), commonly associated with poor posture, prolonged sitting time, and muscle imbalance, is a prevalent condition that significantly impacts quality of life. Office workers typically exhibit more forward posture and, rounded shoulders, thus increasing the risk of developing CTPS. Despite the prevalence of this condition, effective non invasive interventions remain underexplored. PosturePals® is a specialised form of dynamic taping designed to alleviate pain, promote optimal posture, and enhance overall function. While the use of taping in the musculoskeletal condition is well documented, there is limited research on the effects of PosturePals® in CTPS.

Aim: To examine the effects of PosturePals® on pain, craniovertebral angle, and quality of life in a 29-year-old office worker with CTPS.

Materials and Methods: A 29-year-old male office worker with cervicothoracic pain lasting more than 6 weeks, underwent a two-week intervention with PosturePals®, applied once a week for 2 weeks. Along with this, a standard physiotherapy protocol focussing on exercises of the neck and thoracic region was given to the patient. Pain intensity was measured by the Numeric Pain Rating Scale (NPRS), Craniovertebral Angle (CVA) was measured via lateral photographs, and quality of life was evaluated by the SF-36 questionnaire. Assessments were done at baseline and after 2-weeks of intervention.

Results: Significant improvement in pain (NPRS decreased from 7/10 to 3/10), an increase in CVA (45 to 49 degrees), and an improvement in quality of life were observed after the application of PosturePals® along with standard physiotherapy protocol.

Conclusion: PosturePals® appears to be a valuable tool for managing CTPS by improving pain, and CVA and enhancing quality of life. Further research with large sample sizes and a follow-up period is recommended to validate these findings.

Keywords: Cervical pain, Dynamic taping, Forward Head Posture, Posture, Upper Back pain.

Abstract-16

Proprioceptive Neuromuscular Facilitation on Upper Extremity Functional Recovery and Hand Function Among Adults with Stroke: A Systematic Review

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ABSTRACT

Introduction: Upper extremity hemiparesis activity and hand function in individuals following stroke, summarises the current data, identifies existing gaps, and outlines future research and clinical implications. This systematic review describes the role of Proprioceptive Neuromuscular Facilitation (PNF) in the upper limb with muscle synergies to enhance coordination, strength, and mobility. Evidence supports its efficacy on upper extremity recovery and functional movement, which supports the potential ability to increase motor recovery. PNF combines proprioceptive feedback in individuals' lives. It is a neuro-rehabilitative technique of neuromuscular activation of hand dysfunction. Stroke is a leading cause of upper extremity impairment and loss of hand function, which have a profound negative effect on functional activity.

Aim: The study aims to evaluate the effects of PNF on upper extremity functional recovery and hand function in patients with stroke.

Materials and Methods: A thorough exploration of research was implemented by browsing databases such as Academic Search Premier, Scopus, and PEDro, selecting terms like "PoPNF," "stroke," "upper extremity function," and "hand recovery." For instance, articles from English language writers confined to PNF therapies for stroke patients as well as the impact of these treatments were considered. Information about study design, sample characteristics, PNF techniques, outcome measurements, and results was gathered. The data were subjected to the thematic deductions. The outcomes of PNF were systematic analysis of the trends and voids that occurred in the literature.

Results: The review showed that PNF-based treatments have a positive influence on the upper limb function and hand recovery in patients with stroke. Motor skills, strength building, and the ability to perform daily tasks were found to have a major effect on the positive outcompatibility of the method. Specific techniques, such as rhythmic initiation, and dynamic reversals were particularly beneficial to the functional movement of the patients. However, inconsistencies in the way the studies were designed and inaccurate measurement tools made it difficult to make definitive conclusions.

Conclusion: Though the results seem promising, there is still a demand for well-designed studies that would be conducted consistently, and the long-term benefits of PNF in stroke rehabilitation would be validated.

Keywords: Motor recovery, Neuro-rehabilitative, Rehabilitation, Upper extremity impairment

Abstract-17

Development of Lower Limb Muscle Strength Through Plyometric Exercise in a Hip-Hop Dancer: A Case Report

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ABSTRACT
Currently, hip-hop dance is becoming more popular as a global art form. If a dancer experiences an injury, it hinders their capacity to reach their full potential in dance. Long-term injuries can jeopardise a dancer's ability to continue dancing throughout their lives. Two young patients, one aged 20 years and the other 18 years, who were hip-hop dancers visited the outpatient department at Subharti University, Meerut, Uttar Pradesh, India. They complained of experiencing pain and weakness in their lower limbs, indicating a need for further evaluation and assessment of their symptoms. Plyometric exercises were incorporated to enhance the strength of the participants and evaluate their lower limb weakness using the hop and wall sit tests. Treatment was administered four days a week for 3 weeks. The treatment given to the dancers improved their strength, enhanced their performance, and enabled them to dance without pain during performances. Thus, reducing the risk of falls-related injuries.

Keywords: Dance, Exercise, Injury, Performance

Abstract-18

Effect of Strengthening Exercises versus Stretching on Gait Parameters in Patients with Plantar Fasciitis in Delhi NCR- An Experimental Study

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ABSTRACT

Introduction: Plantar fasciitis is one of the most common causes of heel pain and gait difficulties in the Indian population. Patients with plantar fasciitis tend to walk more slowly than healthy individuals, They show a significant reduction in cadence, gait speed, and stride length. An abnormal biomechanical parameter is considered as the risk factor for plantar fasciitis. Strengthening exercises and stretching are widely used for the reduction of pain and improving biomechanical parameters.

Aim: To see the effect of strengthening exercises versus stretching on gait parameters in patients with plantar fasciitis in Delhi NCR.

Materials and Methods: Participants having plantar fasciitis are randomly allocated into Group A and Group B. Group A received invertors and evertors strengthening with resistive bands along with therapeutic ultrasound for 3 sessions per week for 4 weeks, while plantar fascia along with therapeutic ultrasound for 3 sessions per week for 4 weeks was performed for Group B. Outcome measures were pain which was assessed using the Visual Analogue Scale (VAS), foot functions which were assessed using the Foot Function Index, and gait parameters (stride length and step length), which were assessed using the footprint method.

Results: A total of 30 participants are allocated into Groups A and B. Group A showed significant reduction in pain and improvement in gait parameters.

Conclusion: Both strengthening exercises and stretching programmes help reduce pain and improve foot functions and gait parameters in patients with plantar fasciitis. As the sample size is very small so; therefore, future studies with a larger sample size should be conductd.

Keywords: Foot functions index, Gait speed, Pain, Stride length

Abstract-19

Exploring the Efficacy of Low-Level Laser Therapy in Peripheral Nerve Repair: A Systematic Analysis

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ABSTRACT

Introduction: Low-Level Laser Therapy (LLLT) is a non-invasive treatment that uses specific wavelengths of light to promote biological processes such as nerve regeneration and cellular repair, making it a potential therapy for peripheral nerve injuries. Despite promising animal studies, human research on LLLT for peripheral nerve injuries is limited, with no standardised dosimetry or clear dosage guidelines.

Aim: To conduct a systematic review to evaluate existing human studies and provide a comprehensive assessment of LLLT's effectiveness in nerve regeneration.

Materials and Methods: A systematic review was conducted by searching PubMed, Google Scholar, and Scopus databases using the keywords: "low-level laser therapy," "peripheral nerve repair," "nerve regeneration," and "nerve recovery." This study was not registered. The study followed the PRISMA checklist. A total of 68 articles were initially identified, out of which 30 studies met the inclusion criteria based on relevance, study design, and quality assessment. The selected studies primarily included animal models and in vitro research assessing the impact of LLLT on nerve regeneration.

Results: A total of 68 articles were screened, with 38 excluded for various reasons: 3 due to duplicates, 6 due to unavailable full texts, 13 for being reviews, 3 for involving additional treatments with LLLT, 4 for studying laser effects on tissues other than peripheral nerves, 1 for high-intensity laser focus, 5 for missing data, and 3 for being irrelevant. The remaining 30 studies were included in the analysis. The analysis found that LLLT accelerates nerve regeneration by promoting Schwann cell proliferation, increasing Nerve Growth Factor (NGF) expression, and improving neuronal growth. It enhances myelin sheath formation, vascularisation, and collagen synthesis, leading to better functional recovery and structural integrity of peripheral nerves.

Conclusion: LLLT demonstrates potential as an effective treatment modality for peripheral nerve injuries by accelerating nerve regeneration and functional recovery. However, more rigorous clinical studies are necessary to validate its applicability in human patients.

Keywords: Nerve growth factors, Nerve regeneration, Nerve repair, Peripheral nerve injury

Abstract-20

A Study on Aging with Hansen's Disease Overcoming Social Exclusion and Discrimination

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ABSTRACT

Introduction: Hansen's disease or Leprosy is a disease, which still strikes fear in societies as a mutilating, disfiguring, contagious, and incurable disease. Because of the horrifying nature of the enigmatic physical disfigurement and the stigma attached to it, the affected elderly individuals suffer from exclusion from society, and non fulfillment of the special care required by them causing physical and emotional stress and decreased quality of life.

Aim: To analyse the degree of awareness about leprosy, how the affected elderly population is treated, knowledge about its available treatment, and the role of rehabilitative services among the persons affected with leprosy.

Materials and Methods: A total of 150 leprosy-affected elderly individuals were selected from the community. Participants were interviewed based on a self-devised questionnaire which assessed their awareness about the disease and the behaviour of society towards them.

Results: The results of the above survey shows that awareness about the disease is still at a low level and the stigma is reduced but not up to a significant level. The affected individuals suffer from marked segregation from society and ageing-related special needs and care are not fulfilled.

Conclusion: There is a need to reconceptualise the stigma associated with leprosy. Society should be more empathetic towards the leprosy-affected elderly persons. Better steps should be taken towards their acceptance and taking proper care with timely accomplishing medical treatment and improving their quality of life with the help of a physiotherapeutic approach.

Keywords: Discrimination, Leprosy, Rehabilitation, Stigma

Abstract-21

Effectiveness of Dynamic Taping Combined with Resistance Band Training on Dynamic Balance, Jumping Performance, Agility, Sprint Speed, and Lower Limb Strength among Young Football Players: A Feasibility Pilot Study

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ABSTRACT

Introduction: Football, being a high-intensity sport, commands abilities like optimal dynamic balance, agility, jumping performance, sprint speed, and lower limb strength which places repetitive stress on young individuals making them susceptible to lower limb injuries. Dynamic taping is an advanced intervention in sports physiotherapy that varies from classic kinesiology taping in its biomechanical properties and uses. While the classic K-tape primarily focusses on muscle facilitation and pain reduction, dynamic taping provides additional features like multidirectional joint support, enhanced joint stability, and proprioceptive feedback without limiting the joint movement due to its unique elasticity that allows greater force absorption and enhanced neuromuscular control during the dynamic activities. The combination of dynamic taping along with resistance band training may suggest a coactive strategy to improve athletic performance and reduce injury risk. However, the evidence to support this vital combination remains limited in the empirical study.

Aim: This study aims to investigate the effectiveness of dynamic taping combined with resistant band training on key performing factors in young football athletes.

Materials and Methods: A pilot study with a total sample size of 12 was conducted. Participants were randomly assigned to the experimental group (dynamic taping + resistance band exercises) and the control group (resistance band exercises only). Double blinding was used during assessments to minimise bias. Vertical jump, sprint speed, Y-Balance test (YBT), T-test agility, and lower limb strength were evaluated before and after the 4-week intervention (3 sessions per week). Data were analysed using descriptive statistics and paired-samples t-tests.

Results: The baseline characteristics of participants in the control (n=6) and experimental (n=6) groups were comparable in age (15.67±1.03 vs. 15.83±0.75 years) and Body Mass Index (BMI) (20.21±1.22 vs. 19.54±0.94). Post-intervention, the experimental group showed greater improvements in the vertical jump, lower limb strength, agility, balance, and sprint speed, with significant effect sizes (Cohen's d: vertical jump d=4.73, agility d=2.48). Strong correlations were found between the lower limb strength (r=0.88) and balance (r=0.86) improvements. The intervention significantly enhanced sports performance ($p<.05$).

Conclusion: Findings of the study suggest that dynamic taping combined with resistance band training can significantly enhance key athletic performance measures in football players.

Keywords: Athletic Performance, Biomechanics, Neuromuscular Adaptation

Abstract-22

Physical Therapists' Role in Global Health and Sustainability: A Narrative Review

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ABSTRACT

Physical therapists contribute significantly to global health improvement and sustainability by addressing rising non communicable disease rates, disability incidence, and health inequity issues. Healthcare organisations are increasingly valuing preventative techniques and long-term approaches in their projects, hence physical therapists are gaining recognition in global health.This review aims to examine physiotherapist's contributions to sustainability and global health, highlighting collaborative research and methods based on scientific evidence. The literature review investigated results from PubMed and Web of Science together with Scopus search tools. A review of the literature included studies published between 2014 and 2025 to determine the role of physical therapists in sustainable global health initiatives. The Boolean operators search keywords were related to "sustainability", "rehabilitation", "health promotion", "public health", physical therapy" and "global health". The articles were screened for quality assessment through SANRA guidelines. The articles having scores more than six were reviewed and less than six were excluded. The review demonstrates how physiotherapy professionals advance global health through rehabilitation services and non communicable disease management together with disability risk prevention and equal healthcare service delivery. Community-based interventions together with interdisciplinary teams enable physical therapists to improve healthcare access mainly in areas where services are limited. The practice of sustainable rehabilitation now includes telehealth and environmentally friendly clinical approaches which represent critical elements in their professional work. Physical therapists assist public health wellness initiatives by treating patients and building global frameworks for sustainable healthcare. Enhanced participation by physical therapists during policy development training and inter-sectoral collaboration will raise their global authority regarding sustainable healthcare platforms. Future investigations need to establish universal standards that embed sustainability principles into physical therapy practice.

Keywords: Physical Therapy, Global Health, Sustainability, Rehabilitation, Health Promotion, Public Health

Abstract-23

Exploring the Health Impacts of Polycystic Ovarian Disease: A Comprehensive Survey on Well-being and Functionality

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ABSTRACT

Introduction: Polycystic Ovarian Disease (PCOD) is a prevalent endocrine disorder affecting 5–10% of women of the reproductive age group, characterised by hormonal disturbances, metabolic dysfunctions and irregularities related to the functioning of the reproductive system. Anovulatory or irregular menstruation with evident signs of seborrhoea, and elevated testosterone levels characterised as acne, alopecia, hirsutism, and polycystic ovaries are among the most common signs identified in PCOD patients.

Aim: This study aims to identify specific symptoms linked to psychological distress and evaluate the impact of PCOD on physical performance, social participation, and overall quality of life among women affected by the condition.

Materials and Methods: A cross-sectional survey was conducted on a sample of 351 females aged 15 to 49 years. A self-developed validated questionnaire assessing the impact of PCOD on physical, psychological, and social parameters was administered.

Results: The results of the study revealed a notable prevalence of physical, social, and psychological impairments among the surveyed women. Specifically, 8.2% reported experiencing frequent fatigue, while 15.9% exhibited reduced work efficiency. Additionally, a loss of interest in leisure activities was observed in 24.2% of participants, and mood alterations were reported by 14.8% underscoring the diverse impact of PCOD on various aspects of women's daily functioning.

Conclusion: The findings suggest a need to integrate physical activity including lifestyle modifications and structured exercise regimes in addition to medical management to enhance insulin sensitivity, regulate hormones, and reduce stress, thereby improving quality of life and supporting long-term well-being.

Keywords: Physical Activity, Psychological, Quality of Life, Social

Abstract-24

Effectiveness of Vaginal Cones and Kegel Exercises in Treating Postpartum Stress Urinary Incontinence: An Experimental Study

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ABSTRACT

Introduction: Postpartum Stress Urinary Incontinence (PSUI), a common condition among women post-childbirth, brings with it uncomfortable physical complaints and lower quality of life. Conservative treatment is usually favoured over surgical approaches, and the first choice of approach, then, is pelvic floor muscle training. "Kegel exercises" are known to be the traditional non surgical therapy for restoring strength to the pelvic floor muscles. Another approach is through the use of vaginal cones, which provide resistance training to enhance muscle contraction. This study evaluates the effectiveness of vaginal cones with Kegel exercises in treating PSUI.

Aim: To study the effectiveness of vaginal cones and Kegel exercises for the treatment of postpartum stress urinary incontinence: strength improvement of pelvic floor muscles and symptom resolution.

Materials and Methods: An experimental study was done among 30 postpartum women (aged 35-45 years) with a diagnosis of SUI. Participants were divided into two groups; one received a structured vaginal cone therapy, while the other took up the standardised Kegel exercise regimen (with contraction of the pelvic floor muscles for 3-5 sec, then relax with same, 4-5 repetitions per session). Interventions lasted for 4 weeks. Results were measured with Incontinence Questionnaire-Urinary Incontinence, measurement of pelvic floor muscle strength, and through assessment by patients' self-perceived improvement. Data were statistically compared to show any differences before the intervention and at the end.

Results: Both treatment groups demonstrated significant improvements in urinary incontinence symptoms, but the group receiving vaginal cones showed a mean increase in pelvic floor muscle strength that was statistically higher than in the Kegel exercise group ($p<0.05$). There was also increased adherence with vaginal cones.

Conclusion: Both vaginal cones and Kegel exercises are found to be efficient in strength improvement and patient adherence. There is a further need for conducting long-term research studies and monitoring patient preferences.

Keywords: Incontinence Questionnaire, Pelvic floor muscle training, Stress urinary incontinence, Vaginal cones

Physiotherapists Disaster Health Management Core Competencies: A Preliminary Content And Face Validity Study

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ABSTRACT

Introduction: The healthcare system faces substantial challenges from disasters that require proactive healthcare practitioners, including physiotherapists, to lead disaster prevention, preparedness, response efforts, and recovery initiatives. Physiotherapists require validated competencies for effective disaster health management, but there is a lack of standard tools.

Aim: The present study focusses on developing the core competencies scale possessed by physiotherapists for disaster health management and seeks the preliminary content and face validation of the scale.

Materials and Methods: A methodological study was conducted to examine the content validity of the scale through two phases: questionnaire development and judgement. The development phase involved the identification of constructs, followed by item generation and instrument formation. A seven-member expert panel did the judgement of the scale with the Delphi method approach. After three rounds of panel discussions and based on expert comments, the questionnaire was modified and assessed for Content Validity Ratio (CVR), Item Content Validity Index (I-CVI), and Scale Content Validity Index (S-CVI). Further kappa statistics were performed for inter-rater reliability among experts. Final face validation was done through percentage agreement on experts' comments.

Results: The CVR analysis of 104 items produced 39 items with CVR higher than 0.99. Knowledge received 13 items and skills received 14 items while attitude included 12 items as the main constructs. The expert panel unanimously supported all chosen items because their I-CVI scores rested between 0.8 and 1. The calculated S-CVI score reached 0.956, which indicates high content validity for the scale. The expert panel achieved good to very good agreement when rating construct clarity at 0.622, yet simplicity obtained very good agreement at 0.748, along with relevance scoring only moderate agreement at 0.404. The results from face validation showed that 97% of experts agreed on the items.

Conclusion: Preliminary content and face validity assessment demonstrate suitable quantity indices for the tool. The research gives guidance for future psychometric testing of this new assessment scale to evaluate physiotherapists' disaster health management competencies.

Keywords: Competency, Content Validity, Physiotherapy

Abstract-26

Association between Pain and Lower Extremity Function in Recreational College Athletes with Medial Tibial Stress Syndrome: A Cross-Sectional Study

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ABSTRACT

Introduction: Runners frequently experience Medial Tibial Stress Syndrome (MTSS), an overused clinical illness that can cause functional restrictions and an inability to continue running.

Aim: The purpose of this study was to assess the association between pain and lower extremity function in recreational college athletes with MTSS.

Materials and Methods: A cross-sectional study involved 100 participants of the age group 18-25 years who were selected according to inclusion criteria and obtained informed consent before screening. The numerical pain rating scale was used for pain assessment and the lower extremity functional scale was taken to assess functional activities.

Results: A total of 100 participants (55 male, 45 female) with a mean age of 21.44±1.65 years were included with the diagnosis of MTSS. The correlational analysis revealed a statistically significant negative relationship between the numeric pain rating scale and the lower extremity functional scale, r=-.378, p<.001.

Conclusion: Results showed lower limb function tends to decrease as pain levels increase. The results highlight the importance of addressing pain management in interventions aimed at improving lower limb function, as reducing pain may contribute to enhanced functional outcomes. Further research is recommended to explore the causal mechanisms underlying this relationship and to develop targeted strategies for optimising lower limb function in individuals experiencing pain.

Keywords: College student, Functional activity, Lower limb function, Recreational athlete

Abstract-27

The Impact of Epidural Stimulation on Balance and Quality of Life in Spinal Cord Injury Patients- A Literature Review

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ABSTRACT

Introduction: Spinal Cord Injury (SCI) leads to severe motor impairments, significantly affecting postural control, standing ability, and overall functional independence. Epidural Spinal Cord stimulation (ESC) has emerged as a transformative intervention in SCI rehabilitation, promoting neural recovery and enhancing voluntary motor control. Recent systematic reviews highlight ESC's role in improving balance, standing capacity, and global functional outcomes. Understanding the mechanisms and clinical applications of ESC is crucial to optimising rehabilitation strategies for individuals with SCI.

Aim: To evaluate the impact of ESC stimulation on balance, standing ability, and functional recovery in individuals with SCI.

Materials and Methods: A review of existing literature was conducted to analyse the efficacy of ESC in SCI rehabilitation. Studies focussing on postural stability, motor recovery, and neuroplasticity mechanisms were reviewed. Key parameters assessed included standing duration, voluntary muscle activation, and neuromodulatory effects of ESC.

Results: Findings from multiple studies demonstrate that Epidural stimulation in SCI significantly enhances standing ability and voluntary movement in individuals with SCI. Neuroplasticity mechanisms, including synaptic reorganisation and Central Pattern Generator (CPG) activation, contribute to functional restoration.

Conclusion: Epidural stimulation plays a crucial role in SCI rehabilitation, facilitating balance improvement and overall functional enhancement. The integration of ESC into rehabilitation protocols offers a promising avenue for optimising recovery trajectories. Further research is needed to refine stimulation parameters, personalise treatment strategies, and explore long-term therapeutic benefits.

Keywords: Balance Recovery, Functional Rehabilitation, Motor Control, Neuroplasticity

Abstract-28

Comparison of Pelvic Floor Strengthening Versus Breathing Exercises with Kinesio Taping in Primary Dysmenorrhoea Among Young Females: A Randomised Clinical Trial Protocol

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ABSTRACT

Introduction: Primary Dysmenorrhoea (PD) is a menstrual disorder that refers to painful cramps before and/or during menstruation. About 50 to 90 percent of women feel menstrual pain, which can be so bad that it is sometimes blamed for social problems like missing work or school frequently. Although the prevalence is highest in the age range of 16-25 years, many women do not seek medical attention despite experiencing significant pain because they believe that it is a natural aspect of the menstrual cycle.

Aim: The study aims to investigate the effects of Kinesio taping, breathing techniques, and pelvic floor strengthening exercises on premenstrual pain in young women.

Materials and Methods: The study design is a randomised clinical trial and the data will be collected from Greater Noida colleges. The

outcome of the study will be the premenstrual questionnaire and the Numeric Pain rating scale. One hundred subjects who meet the inclusion criteria and have premenstrual pain will be selected and randomly divided into two groups based on the inclusion criteria. The consent form and questionnaire will be filled out by the subjects. Group A will be given taping, pelvic strengthening exercises, and breathing exercises and Group B will be given taping and breathing exercises. Group A after filling out the questionnaire taping will be applied 2 days before the expected date of the menstrual cycle for 4 days and then the next taping will be done in the next month 2 days before menstruation. Thus, taping is done once a month for 3 months. In Group B, the taping will be applied 2 days before menstruation and kept for 4 days then the procedure is repeated every week for 3 months.

Results: The data obtained will be analysed using appropriate statistical methods and the significance level will be set at $p<0.05$.

Conclusion: In this study, we will try to fill this knowledge gap on the role of exercises and taping along with breathing techniques to decrease premenstrual pain in young females.

Keywords: Mentrual pain, Numeric Pain rating scale, Premenstrual syndrome

Abstract-29

Effectiveness of Manual Therapy on Pain, Range of Motion, and Function in Patients with Upper Trapezius Myofascial Trigger Points: A Systematic Review

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ABSTRACT

Introduction: A prominent cause of pain that manifests in the musculoskeletal system is Myofascial Trigger Points (MTrPs). It forms a distinct reason for its evaluation, frequently exhibiting neck pain leading to occupational disability. In the past two decades, optimal manual therapeutic strategies have been deployed to manage MTrPs with myofascial release, positional release, muscle energy technique, ischemic compression therapy, transverse frictional massage, manual pressure release, trigger point therapy, and exercise therapy.

Aim: This review aims to extract, summate, and present promising techniques from evidence-based practice in managing upper trapezius trigger points.

Materials and Methods: Databases of PubMed, Google Scholar, and Cochrane were searched. Methodological quality was assessed independently by two authors using the PEDro scale. Four main outcome parameters were evaluated in the short and medium term: pain, pain pressure threshold, cervical range of motion, and disability including muscle stiffness.

Results: After fulfilling the inclusion and exclusion criteria, 15 articles were incorporated in the systematic review. The mean age of the participants included in the studies is 27.7±5.5 years. Two independent authors verified and screened data, and the third author double-checked and searched for additional articles. A risk of bias graph and summary were developed using Review Manager Version 5.4.

Conclusion: Findings reveal manual therapy influences clinical presentation in patients with upper trapezius trigger points by reducing pain intensity and duration along with accelerating cervical range of motion and reducing the incidence of neck disability.

Keywords: Muscle stiffness, Neck pain, Occupational disability, Trapezius

Abstract-30

Correlation between Emotional Labour and Job Satisfaction among Physiotherapists in Multispecialty Hospitals of Delhi NCR: A Cross-sectional Survey

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ABSTRACT

Introduction: Healthcare delivery has undergone significant changes, making Emotional Labour (EL) a key factor in worker well-being and service quality. Physiotherapists often navigate patients' pain, fear, and expectations, leading to emotional strain.

Aim: This study quantifies the relationship between EL dimensions—surface acting, deep acting, suppression, and emotional consonance—and job satisfaction to inform strategies for improving workplace experience.

Materials and Methods: A quantitative correlational design was used to measure these relationships among 400 physiotherapists in direct patient care. Data were collected using standardised questionnaires: the Dutch Questionnaire on Emotional Labor (D-QEL) assessed four EL dimensions, while the Minnesota Satisfaction Scale measured general, intrinsic, and extrinsic job satisfaction. Comprehensive statistical analyses determined the strength and direction of these associations.

Results: General satisfaction negatively correlated with surface acting ($r=-0.917$, $p<0.001$), deep acting ($r=-0.896$, $p<0.001$), and suppression ($r=-0.910$, $p<0.001$), while emotional consonance showed a positive correlation ($r=0.870$, $p<0.001$). Intrinsic satisfaction, reflecting personal fulfillment, also negatively correlated with surface acting ($r=-0.935$, $p<0.001$), deep acting ($r=-0.918$, $p<0.001$), and suppression ($r=-0.926$, $p<0.001$), but positively with Emotional Consonance ($r=0.879$, $p<0.001$). Similarly, extrinsic satisfaction, linked to external job factors, showed strong negative correlations with surface acting ($r=-0.921$, $p<0.001$), deep acting ($r=-0.903$, $p<0.001$), and suppression ($r=-0.916$, $p<0.001$), but a positive correlation with emotional consonance ($r=0.872$, $p<0.001$).

Conclusion: Higher emotional consonance significantly improves job satisfaction, while surface acting and suppression contribute to dissatisfaction. Training in emotional intelligence can enhance physiotherapists' well-being and overall job satisfaction, ultimately improving healthcare service quality.

Keywords: Deep acting, Emotional consonance, Emotional suppression, Surface acting

Abstract-31

Exploring the Relationship Between Insoles and Foot Posture: A Systematic Review of Interventions and Efficacy

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ABSTRACT

Introduction: Foot posture significantly influences overall biomechanics and can lead to discomfort and injury.

Aim: This systematic review aims to evaluate the relationship between insoles and foot posture, specifically examining the effectiveness of various insole types and their combinations with exercises in improving foot alignment and reducing pain.

Materials and Methods: A systematic literature search was conducted across databases including PubMed, Scopus, and ScienceDirect. Eligible studies included Randomized Controlled Trials (RCTs) and systematic reviews that assessed the impact of insoles on foot posture metrics. Data were extracted on study design, participant characteristics, intervention types, and outcomes related to foot posture and pain.

Results: The review identified significant improvements in foot posture associated with customised arch support insoles, which enhanced navicular height, and lateral wedge insoles, which reduced knee adduction moments. Medially wedged insoles decreased excessive pronation. Notably, interventions combining insoles with exercises yielded superior results in improving foot posture compared to insoles alone.

Conclusion: Insoles are effective in managing foot posture abnormalities, especially when used in conjunction with exercises. These findings suggest that personalised treatment strategies incorporating both insoles and therapeutic exercises can optimise outcomes for individuals with varying foot postures. Future research should focus on long-term effects and the development of tailored interventions for diverse populations.

Keywords: Knee adduction moments, Orthotics, Randomised controlled trials, Therapeutic exercises

Abstract-32

Effect of Aerobic Exercises on Percutaneous Transluminal Coronary Angioplasty: A Systematic Review

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ABSTRACT

Introduction: Cardiovascular Diseases (CVDs) are a leading cause of morbidity and mortality, with Coronary Artery Disease (CAD) being highly prevalent. Percutaneous Transluminal Coronary Angioplasty (PTCA) is a minimally invasive intervention aimed at restoring blood flow in obstructed coronary arteries. Despite its success, post-procedural complications such as restenosis, endothelial dysfunction, and reduced cardiac efficiency remain challenging. Aerobic exercise has been recognised as a crucial component of cardiac rehabilitation, offering benefits such as improved endothelial function, reduced inflammatory markers, enhanced myocardial efficiency, and increased functional capacity. This systematic review evaluates the impact of aerobic training on post-PTCA recovery, emphasising cardiovascular benefits and long-term rehabilitation strategies.

Aim: This systematic review aims to assess the impact of aerobic exercise, on cardiovascular function, vascular health, and overall recovery in post-PTCA patients. The review also seeks to determine the role of structured aerobic interventions in reducing restenosis risk, improving myocardial efficiency, and enhancing quality of life.

Materials and Methods: A comprehensive literature search was conducted across electronic databases, including PubMed, Scopus, Web of Science, and Google Scholar, covering studies published between 2000 and 2023. The search strategy utilised Medical Subject Headings (MeSH) and relevant keywords such as "Percutaneous Transluminal Coronary Angioplasty (PTCA)," "Aerobic Exercise," "Cardiac Rehabilitation," "Restenosis Prevention," "Endothelial Function," and "Functional Capacity." Boolean operators (AND, OR) were applied to refine search results. Studies assessing aerobic exercise interventions

in PTCA patients, focussing on cardiovascular function, endothelial health, restenosis prevention, myocardial efficiency, functional capacity, and quality of life were included. Exclusion criteria included studies with non human subjects, lack of sufficient data on aerobic interventions, and research limited to non aerobic exercise or pharmacological treatments. The PRISMA guidelines were followed for study selection.

Results: The review found that structured aerobic training, including MICT and HIIT, significantly enhances endothelial function by increasing nitric oxide availability, reducing oxidative stress, and promoting vasodilation. Improvements in myocardial efficiency, such as increased stroke volume, cardiac output, and reduced oxygen demand at submaximal workloads, were reported. Additionally, aerobic training led to increased peak oxygen uptake (VO2 max) and improved functional capacity, resulting in better physical performance and quality of life. Supervised exercise interventions were associated with increased adherence, reduced anxiety and depression, and enhanced long-term cardiovascular health outcomes.

Conclusion: Aerobic exercise is a highly effective non pharmacological strategy for improving cardiovascular health in post-PTCA patients. By enhancing endothelial function, reducing restenosis risk, and improving myocardial efficiency, structured aerobic interventions contribute significantly to long-term rehabilitation. Further studies should explore patient-specific exercise protocols and adherence strategies to optimise post-PTCA recovery.

Keywords: Aerobic Exercise, Endothelial Function, Functional Capacity, PTCA Rehabilitation, Restenosis Prevention

Biomechanical Evaluation of the Diabetic Foot: A Literature Review on the Need for Customised Footwear

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ABSTRACT

Introduction: The 2021 International Diabetes Federation (IDF) report reveals that India has around 74 million people with diabetes, ranking second globally after China, highlighting a serious public health challenge. Biomechanical considerations have become central in managing diabetic foot disease, recognising the crucial role they play in both prevention and treatment. Assessing foot biomechanics is crucial for understanding diabetic foot anatomy and designing effective interventions. This includes customised footwear to correct deformities like hallux valgus and prevent complications. Significant progress in diabetic foot biomechanics has led to advanced assessment methods for personalised care. Factors like gait and weight distribution are now recognised in foot deformity development. This review highlights these advancements and their role in improving prevention and treatment strategies.

Aim: This review objectives were to find out the different methods of assessment and evaluation of diabetic foot for customisation of footwear.

Materials and Methods: A comprehensive search was conducted in several databases, including Google Scholar, PubMed, Global Health Archive, and various journals and books accessed through the Internet. In this paper, we emphasise four key dimensions essential for a comprehensive foot assessment. Measurement Selection.2. Objectivity of Procedures 3. Analysis of Foot Measurements:4. Factors Influencing Foot Shape.

Results: This literature review assessed the various dimensions of diabetic foot conditions which requires a comprehensive approach to ensure accurate diagnoses and effective treatment plans. The commonly used techniques for assessing diabetic foot conditions are Visual inspection of signs of ulcers, wounds, or other abnormalities of the foot. Sensory testing using monofilaments, tuning forks, or other tools, through vascular assessment the blood flow and circulation in the feet were checked using the Doppler ultrasound method, Neurological evaluation assess nerve damage and detect any signs of neuropathy. Imaging studies using X-rays and MRI to evaluate the deformities in neuropathic foot i.e. Charcot's foot. The measurement analysis focusses on foot length, width, arch height, toe length, and hallux valgus angle.

Conclusion: This review examines how various techniques for assessing diabetic foot health affect outcomes and explores potential improvements in analysing foot shape. Several methods have been developed to quantify foot shapes, particularly for the tailored design of footwear and orthotics. A deeper understanding of the connections between foot structure, human physiology, and biomechanics is crucial as researchers strive to enhance.

Keywords: Customised diabetic footwear, Diabetic foot ulcer prevention, Foot deformities in diabetes, Gait analysis in diabetes, Orthotic interventions, Plantar pressure distribution

Abstract-34

Effect of Herbal Plants in Diabetes: A Systematic Review

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ABSTRACT

Introduction: Herbal plants have gained significant attention as complementary approaches to managing diabetes, providing natural ways to control blood glucose, enhance insulin sensitivity, and support metabolic health. This article delves into the potential of various medicinal herbs in diabetes management by outlining their mechanisms of action, such as promoting insulin secretion, regulating glucose metabolism, reducing inflammation, and providing antioxidant effects. Notable plants like Aloe Vera, Bitter Melon, Fenugreek, Cinnamon, Turmeric, and Gymnema Sylvestre, as well as other active compounds, are analysed for their specific therapeutic benefits.

Aim: This study aims to study the effect of herbal plants on diabetes.

Materials and Methods: The current review is carried out under the standards specified in the Scale for the Assessment of Systematic Review Articles checklist assuring thorough assessment of its technique, analysis, transparency, and scope to improve its legitimacy, transparency, and quality in the field of health science. Searches were extensively conducted across several databases including MEDLINE, Scopus, Embase, and Web of Science with the relevant keywords: "Herbal remedies and Diabetes Milletus", "Prediabetes and/or Herbs", " Prediabetes and Herbal remedies.

Results: Herbal plants have long been utilised in traditional medicine for managing diabetes mellitus, offering potential benefits through various mechanisms. Herbs such as Fenugreek, Bitter Melon, and Turmeric, for instance, contain fibre, alkaloids, and antioxidants, which together help in glycaemic control without causing severe side effects that are often associated with long-term pharmaceutical use.

Conclusion: Herbal plants hold promising potential as complementary treatments for diabetes by supporting glycaemic control, enhancing insulin function, and contributing to overall metabolic health. Although they offer several benefits, further rigorous, large-scale clinical trials are necessary to establish their effectiveness and safety profiles, especially for long-term use. Standardisation and quality control of herbal extracts remain critical challenges, as variations in potency and purity can significantly impact therapeutic outcomes.

Keywords: Antioxidant effects, Diabetes prevalence, Herbal medicine, Insulin sensitivity, Pathophysiology

Abstract-35

Effectiveness of Pulmonary Rehabilitation in Older Adults with Chronic Obstructive Pulmonary Disease (COPD): A Review

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ABSTRACT

Introduction: Chronic Obstructive Pulmonary Disease (COPD) is a progressive respiratory condition that significantly impairs lung function and Quality of Life (QoL), particularly in older adults. Pulmonary Rehabilitation (PR) has been recommended as a non pharmacological intervention aimed at improving exercise tolerance, reducing symptoms, and enhancing overall well-being.

Aim: The primary objective of this review is to assess the impact of pulmonary rehabilitation on pulmonary function, exercise capacity, symptom management, and QoL in older adults with COPD. This study is conducted to specifically assess the effectiveness of PR in older adults, considering the unique challenges and co-morbidities they may present.

Materials and Methods: Electronic databases such as PubMed, Google Scholar, and Scopus were reviewed for these studies published between 2020 and 2024. Inclusion criteria encompassed observational studies assessing PR outcomes in COPD patients aged 60 years and above. Data extraction focussed on pulmonary function tests (FEV1, FVC), 6MWT, dyspnoea scores, and QoL assessments using validated scales such as the St. George's Respiratory Questionnaire.

Results: Findings showed that PR led to measurable improvements in exercise capacity, with participants demonstrating an average increase in 6MWT distance by 40–70 meters. Dyspnoea scores indicated a moderate reduction in symptom severity post-rehabilitation. QoL assessments using the SGRQ revealed significant improvements in physical function and emotional well-being. Pulmonary function test results (FEV1, FVC) showed minor but consistent enhancements in lung performance. In the above study, we found that in many studies there is significant effectiveness of PR on COPD patients.

Conclusion: PR is a valuable and practical intervention for older adults with COPD, significantly enhancing exercise capacity, reducing dyspnoea, and improving overall QoL. Although improvements in pulmonary function are modest, the benefits of PR in disease management and symptom control are well-documented.

Keywords: Dyspnoea, Exercise capacity, Observational studies, Quality of life

Abstract-36

A Comparative Study to Evaluate the Effectiveness of MET And MFR on Leg Length Discrepancy and Pain in Chronic Low Back Pain Patients

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ABSTRACT

Introduction: Low back pain is a prevalent issue that impacts the lower back region area among the working-age population. Numerous musculoskeletal problems like pain, restricted range of motion, decreased muscular strength and endurance, and leg length discrepancy are known to occur in patients with low back dysfunction. Manual techniques like Muscle Energy Technique (MET) and Myofascial Release techniques (MFR) are being employed in LBP patients to improve pain. MET is a type of manual treatment that utilises the energy of the muscle performing mild isometric contraction to stretch the muscle and relax through reciprocal or autogenic inhibition. Myofascial release technique is a manual therapy used to treat back pain by applying gentle, sustained pressure to tight areas of muscle fascia to release tension and improve flexibility by addressing trigger points and restrictions, hence improving pain and range of motion.

Aim: This study aimed to determine the effect of MET and MFR on leg length and pain in chronic low back pain patients with leg length discrepancy.

Materials and Methods: Thirty LBP patients with leg length discrepancy participated in the study and were randomly assigned to the MET group (n = 15) and MFR group (n = 15). The MET group performed three METs with 5 s of isometric contraction and 30 s of rest once daily for one week and the other group received MFR ontight back muscles on the short side to decrease pain and leg

length discrepancy, once daily for one week. The side that appears shorter often has a lateral pelvic tilt and a shortening of the lateral flexor muscles. True leg length was done by tape and the Numerical Pain Rating Scale (NPRS) scale was used to evaluate pain before intervention and after one week post intervention.

Results: In comparison pre- and post-intervention, the MET group showed significant improvement in leg length measurement and pain intensity levels ($p<0.05$). In comparison between groups, there were significant differences in both variables leg length and pain ($p<0.05$).

Conclusion: This study concludes that MET is a better intervention than MFR for improving leg length discrepancy and pain in LBP patients.

Keywords: Endurance, Isometric contraction, Muscle strength, Restricted range of motion

Abstract-37

Effects of Forward Vs Backward Pedalling on Pain, Disability and Functional Performance in Knee Osteoarthritis Patients: A Comparative Study

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ABSTRACT

Introduction: Stationary cycling has been shown to produce effects of aerobic exercise training in healthy adults. Studies have been done to compare the effect of walking versus cycling on quality of life and functional performance among knee osteoarthritis patients. There is very little research or study comparing the effectiveness of forward and backward cycling in knee osteoarthritis patients.

Aim: The main purpose of the study was to investigate the effect of forward vs backward pedalling on Pain, Disability, and Functional performance in knee Osteoarthritis (OA) patients and to find out which pedalling direction offers more advantages in knee OA patients.

Materials and Methods: The study was a pre- and post-experimental design study, involving three groups, i.e., the forward-pedalling group, the backward-pedalling group, and a control group. Thirty patients diagnosed with mild to moderate knee OA of both genders between the age group of 40-60 years, were selected by a convenience sampling method and completed 3 weeks of cycling intervention on a stationary cycle, performed 5 days per week. Subjects in the controlled group did only conventional exercises for 3 weeks. Primary outcome measures included Knee Injury and Osteoarthritis Outcome Score (KOOS) and Numeric Pain Rating Scale (NPRS) and the Timed Up and Go (TUG) scale was the secondary outcome measure.

Results: Results showed that muscle contributions to particular biomechanical functions during forward and backward pedalling remain largely the same and did not change according to pedalling direction.

Conclusion: The conclusions of the study were both forward and backward pedalling is effective in reducing pain and improving functional performance in knee OA. Also, there is no additional benefit or difference in the effect of either of the pedalling directions and both can be used for rehabilitation of knee OA.

Keywords: Conventional exercises, Knee Injury and Osteoarthritis Outcome Score, Stationary cycle, Timed Up and Go

Abstract-38

Effect of Transdermal Magnesium and Moderate Intensity TheraBand Training on Pressure Pain Threshold, Disability and Quality of Life Among Adults with Sciatic Pain: A Research Protocol

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ABSTRACT

Introduction: Sciatic pain, commonly known as sciatica, is a prevalent condition characterised by radiating pain along the sciatic nerve pathway, significantly affecting an individual's quality of life due to discomfort, numbness, and muscle weakness.

Aim: To study the effect of transdermal magnesium and moderate intensity TheraBand training on quality of life among adults with sciatic pain.

Materials and Methods: A two-group pretest-post-test randomised clinical trial will be conducted in recognised hospitals in Delhi using simple random sampling from February 2025 to February 2026. Two groups will be formed, each consisting of 56 subjects. Group A will serve as the experimental group to receive a transdermal magnesium spray and TheraBand exercises. Group B, the control group, will receive sham transdermal magnesium spray and TheraBand exercises, both groups will be treated for 3 days in a week for 8 weeks.

Results: The paired t-test will be employed to assess subjective parameters within the same group, while the unpaired t-test will be used for intergroup comparisons, establishing a significance level of <0.05.

Conclusion: The combined application of Transdermal Magnesium and moderate-intensity TheraBand training has shown significant potential in improving pressure pain threshold, reducing disability, and enhancing the quality of life in adults with sciatic pain. This integrated approach addresses both biochemical and functional aspects, offering comprehensive rehabilitation benefits.

Keywords: Muscle weakness, Rehabilitation, Sciatica

Abstract-39

Motor Imagery on Pain, Functional Capacity, and Quality of Life in Individuals with Chronic Neck Pain: A Review

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ABSTRACT

Introduction: Interventions for neck pain have emerged as promising approaches to improve quality of life in multiple dimensions.

Aim: This study aimed to explore the multifaceted impact of these techniques on people with neck pain, focussing on their physical, emotional, and social well-being.

Materials and Methods: Searched with the keyword 'Motor Imagery' or 'functionality' or 'functional capacity' (all fields) AND 'Neck pains' OR 'Chronic Neck Pain' OR 'Pain, Neck' OR 'Pains, Neck' OR 'Neck Ache' OR 'Ache, Neck' OR 'Aches, Neck' OR 'Neck Aches' in the WoS database in all fields and article as document types up to this year in English language only.

Results: Mental imagery, a cognitive technique that involves the mental rehearsal of movement without physical execution, has emerged as a promising adjunctive therapy for the treatment of Chronic Neck Pain (CNP). Numerous studies have investigated the efficacy of improving functional capacity in patients with CNP, thus incorporating training alongside traditional physical therapy interventions produces superior outcomes compared with physical therapy alone. A significant benefit of this approach is its ability to modulate pain perception in patients with CNP. Pain and discomfort intensity can be reduced by mentally rehearsing movement patterns and visualising pain-free activities.

Conclusion: Integration of comprehensive rehabilitation programmes holds great promise in improving the outcomes of patients with CNP by advancing our understanding of its mechanisms, optimising treatment protocols, exploring innovative delivery methods, and evaluating long-term outcomes; future research can further enhance the effectiveness and accessibility of interventions for CNP.

Keywords: Cognitive, Kinesthesia, Muscle coordination, Pain perception, Rehabilitation

Abstract-40

Home-Based Rehabilitation on Precision Handling in Elderly Female with Rheumatoid Arthritis: A Case Study

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ABSTRACT

Introduction: Rheumatoid Arthritis (RA) is a chronic autoimmune disorder that primarily affects the joints, leading to pain, stiffness, and reduced functional ability. Elderly females with RA often experience significant impairments in precision handling, impacting their independence in daily activities. Home-based rehabilitation programmes provide an accessible and cost-effective alternative to conventional therapy, allowing for personalised care and functional improvements within a familiar environment.

Aim: This case study aims to evaluate the effectiveness of a structured home-based rehabilitation program in improving precision handling and hand function in an elderly female with RA.

Materials and Methods: A 60-year-old female with a 10-year history of RA and significant impairments in hand dexterity was enrolled in an 8-week home-based rehabilitation program. The intervention included joint protection techniques, therapeutic exercises focussing on fine motor control, functional task training, and pain management strategies. Outcome measures such as the Purdue Pegboard Test, grip strength assessment, and self-reported functional ability (using the Disabilities of the Arm, Shoulder, and Hand [DASH] questionnaire) were recorded at baseline, mid-intervention, and post-intervention.

Results: Following the rehabilitation program, the patient demonstrated notable improvements in precision handling and hand

dexterity. The Purdue Pegboard Test scores increased by 30%, grip strength improved by 20%, and DASH scores showed a 35% reduction in disability perception. The patient reported enhanced confidence in performing daily activities such as buttoning clothes, handling utensils, and writing.

Conclusion: Home-based rehabilitation proved to be an effective approach for improving precision handling in an elderly female with RA. The structured intervention enhanced fine motor control, functional independence, and quality of life. This case study highlights the potential of home-based programs as a viable alternative to traditional therapy, particularly for elderly individuals with mobility constraints.

Keywords: Hand function, Fine motor control, Functional independence, Joint mobility

Abstract-41

Role of Mental Imagery in the Post-operative Management of Coronary Artery Bypass Grafting: A Case Report

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ABSTRACT

Introduction: In the Indian subcontinent, the leading cause of illness and death is coronary artery disease. Coronary Artery Bypass Grafting (CABG) is performed to improve vascular efficiency in the heart which improves the life expectancy of the individual; however, it is associated with various complications. One of the most common complications following surgery is depression, stress, and anxiety which in turn can affect the overall prognosis of the patient. Mental imagery can play an important role in reducing the psychological problems associated with these patients. It involves the visualisation of positive scenarios which can further reduce psychological distress and promote relaxation among patients post-CABG.

Aim: To study the role of mental Imagery in the postoperative management of CABG.

Materials and Methods: We presented a case of a 78-year-old man with a history of hypertension who underwent CABG for triple vessel disease. The patient followed a four-week rehabilitation programme, including an incentive spirometer, breathing exercises, trunk mobility exercises, ambulation, and mental imagery. Reassessment was conducted after one month, with anxiety and stress levels evaluated using the Depression, Anxiety, and Stress Scale (DASS-21) and functional capacity assessed through the six-minute walk test.

Results: A significant difference was observed in stress and anxiety levels after the administration of mental imagery techniques, along with an improvement in the patient's functional capacity.

Conclusion: Our study suggests that incorporating mental imagery techniques into the existing treatment plan can enhance the emotional well-being of post-CABG patients by reducing stress and anxiety. This holistic approach not only helps lower morbidity and mortality associated with psychological factors but also improves the overall quality of life.

Keywords: Anxiety, Psychological distress, Spirometer, Stress

Effect of Pulmonary Rehabilitation on a 79-Year-Old Female with Severe COPD, Respiratory Muscle Weakness, and DVT - A Case Report

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ABSTRACT

Chronic Obstructive Pulmonary Disease (COPD) is a progressive lung disease marked by breathing difficulties. It is increasingly prevalent, especially in the elderly, and often leads to hospitalisation and decreased quality of life. Pulmonary Rehabilitation (PR), including exercise and education, is essential for management. Some patients also benefit from Neuromuscular Electrical Stimulation (NMES). COPD patients are at higher risk for Deep Vein Thrombosis (DVT), which can further worsen respiratory problems. This necessitates careful management of mobility and anticoagulation during PR. To evaluate the impact of a structured 6-week pulmonary rehabilitation programme on respiratory function, muscle strength, mobility, and mental well-being in the elderly 79-year-old patient with severe COPD,DVT,suspected pulmonary embolism, and respiratory muscle weakness. A 79-year-old female with a history of COPD, respiratory failure, and DVT was enrolled in a structured 6-week PR program post-hospital discharge. Upon initial assessment, she had a Borg Scale dyspnoea score of 7, an mMRC grade of 5, and was non ambulatory. Her SpO_2 levels were 89-90% with 5 L/min oxygen during ambulation and 75% on room air. Respiratory muscle strength was significantly compromised (Pimax: 25 cmH2O, Pemax: 31 cmH2O). The Hospital Anxiety and Depression (HAD) score at baseline was 11 for anxiety and 12 for depression. A High-Resolution Computed Tomography (HRCT) chest scan in the third week of rehabilitation showed no pulmonary embolism and no significant progression of COPD. However, mild progression of bronchiectasis and air trapping was noted. Significant improvements were observed after six weeks of PR in all outcome criteria. This case highlights the importance of a structured PR program incorporating breathing retraining, respiratory muscle training, NMES, and progressive strength training in improving functional capacity and quality of life in patients with severe COPD and respiratory muscle weakness. The patient demonstrated substantial improvements in respiratory muscle strength, mobility, and mental well-being, reinforcing the efficacy of PR. Furthermore, the successful rehabilitation of a patient with a history of DVT underscores the importance of careful patient monitoring,continuous medication, and tailored exercise protocols to mitigate the risk of thromboembolic complications during rehabilitation. The findings underscore the necessity of personalised rehabilitation strategies tailored to the unique needs of elderly patients with multiple comorbidities.

Keywords: Inspiratory Muscle Training, Pulmonary Rehabilitation, Respiratory Muscle Training, Neuromuscular Electrical Stimulation

Abstract-43

Biomechanical Insights into Barefoot Vs Shod Walking and Running in Children, Kinematic and Kinetic Perspective: A Narrative Review

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ABSTRACT

Children's feet undergo significant changes in shape, size, ligament strength, muscle structure, and arch development as they grow. These changes influence gait patterns, which differ notably from adults. The development of mature gait patterns in children is influenced by factors such as barefoot and shod walking/ running. Footwear reduces impact forces and alters movement, force distribution, and sensory feedback, whereas barefoot walking promotes arch development through frequent windlass mechanism activation and allows greater foot and toe flexibility. Still, the impact of barefoot and shod walking and running on children's gait biomechanics remains controversial. Understanding these differences can help analyse injury mechanisms that may emerge in adulthood.

Materials and Methods: A comprehensive search was conducted across databases like PubMed, Web of Science, and Scopus. After an extensive search, 13 relevant studies were found. These studies used motion capture and gait analysis systems to assess the impact of footwear on a child's walking and running biomechanics. Participants performed walking and/or running trialson a walkway or treadmill to capture the kinematics and kinetics of gait.

Results: Barefoot walking and running generally preserve more natural foot biomechanics compared to wearing shoes. Kinematically, barefoot walking allows a greater joint range of motion. From akinetic perspective, barefoot walking led to lower vertical Ground Reaction Forces (GRF) at initial contact and push-off reducing the overall impact on joints.

Conclusion: The included studies strongly support that barefoot walking promotes natural foot mechanics, better movement efficiency, and reduces impact forces.Though shoes offer protection and stability, but are associated with restricting foot mobility and altering biomechanics. Therefore, an ideal shoe should mimic barefoot conditions- light, flexible, and minimally restrictive to allow young feet to move, grow, and function. This will indeed help to shape the future of movement of a developing child.

Keywords: Footwear, Gait pattern, Motion analysis, Paediatric, Spatiotemporal parameters

Effect of Pelvic Proprioceptive Neuromuscular Facilitation on Balance, Postural Sway and Quality of Life in Chronic Stroke Patients: A Case Series

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ABSTRACT

In individuals who have been living with the effects of a stroke for an extended period, commonly referred to as chronic stroke patients, there is a notable presence of balance deficits, leading to increased postural sway and a decline in overall quality of life. Addressing these challenges head-on, pelvic proprioceptive Neuromuscular Facilitation (PNF) emerges as a focussed treatment strategy pinpointing the pelvic region to enhance coordination, mobility, and stability, offering crucial improvements in daily functioning and well-being.

Aim: To investigate the effect of pelvic PNF on balance, posture sway, and quality of life with chronic stroke patients.

Materials and Methods: Five patients (4 men and 1 woman) between 40 and 65 years diagnosed with chronic stroke were treated using pelvic PNF included in the case series. The baseline data (balance, posture sway, and quality of life) was assessed pre and postintervention. Balance was assessed using the Berg balance scale; posture sway was assessed using the sway meter and quality of life was assessed using the Stroke-Specific Quality of Life (SS-QoL) scale. The effectiveness of pelvic PNF was ruled out by comparing both pre and post-baseline data in chronic stroke patients.

Results: This case series presented evidence of the possible efficacy of pelvic proprioceptive neuromuscular facilitation techniques to enhance equilibrium, diminish posture instability, and elevate the quality of life among individuals suffering from chronic stroke.

Conclusion: This case series showed that PNF greatly improved balance and experienced better stability and confidence in daily activities for chronic stroke patients. Pelvic PNF stands out for its effectiveness in reducing postural sway and enhancing overall quality of life.

Keywords: Balance, Chronic stroke, Pelvic PNF, Postural sway, Quality of life.

Abstract-45

Effect of FIFA 11+ Warm-Up Programme on Fitness Parameters and Athlete Quality of Life Among Recreational Football Players: An Experimental Study

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ABSTRACT

Introduction: Football is a high-intensity sport requiring optimal functioning of various motor components. An efficient warm-up regimen is critical in helping players prepare for their game. The FIFA 11+ program includes several exercises aimed at improving players' neuromuscular, cardiovascular, and explosive capacities.

Aim: The purpose of this study is to assess the influence of the FIFA 11+ warm-up program on fitness parameters and athlete quality of life in recreational football players, as well as to compare its efficacy to traditional static and dynamic stretching routines.

Materials and Methods: An experimental study with pre-post analysis was conducted at the football club of Aligarh Muslim University and involved 49 recreational male football players (18-35 years) who had never participated in the FIFA 11+ program. Participants were divided into two groups: Group A (25 players) and Group B (24 players). The interventions were delivered three times each week for six weeks.

Results: Group A showed notable improvements in all outcome measures compared to Group B, indicating mixed intervention outcomes. These findings highlight the varied effectiveness of the interventions implemented in the experimental group across different measures.

Conclusion: The FIFA 11+ warm-up program is superior to conventional stretching routines in enhancing fitness parameters and overall athlete well-being and should be included in routine training programs.

Keywords: Balance, Motor components, Performance, Physical fitness

Abstract-46

Enhancing a Chairside Oral Healthcare Technology: A Novel Risk Assessment Prototype for Abnormal Oral Lesion Detection

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ABSTRACT

Introduction: The accurate classification of oral lesions as normal or abnormal is critical for timely diagnosis and treatment in oral healthcare. Early and reliable detection plays a crucial role in improving patient outcomes. This study investigates the efficacy of a novel device designed for this purpose.

Aim: This study aims to evaluate the performance of a newly developed device for classifying oral lesions, assessing its accuracy, precision, recall, and F1-score to determine its clinical applicability.

Materials and Methods: A dataset of oral lesion images was utilised to evaluate the device's performance. The device employs a classification model trained to distinguish between normal and abnormal lesions. Key performance metrics, including accuracy, precision, recall (sensitivity), and F1-score, were analysed to assess its diagnostic capability.

Results: The device demonstrated an accuracy of 89%, indicating a strong ability to categorise lesions correctly. It achieved a precision of 77% and a recall of 72.81%, effectively minimising false positives while identifying a significant portion of actual abnormal lesions. The F1-score of 75.12% further emphasised its balanced diagnostic performance.

Conclusion: The findings highlight the potential of the developed device for real-world clinical applications in oral healthcare. Its high accuracy and balanced performance suggest readiness for integration into routine clinical practice, offering a promising tool for early detection and evaluation of oral health abnormalities. Further validation studies and clinical trials are necessary to confirm its utility and impact on patient outcomes.

Keywords: Classification model, Diagnostic device, Accuracy, Precision, Recall, F1-score, Clinical application.

Abstract-47

Effect of Dynamic Taping on Pain, Disability, and Grip Strength among Patients with De Quervain's Tenosynovitis: A Case Series

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ABSTRACT

De Quervain Tenosynovitis, a painful condition marked by the swelling and irritation of the tendons located on the radial (thumb) side of the wrist, can severely limit hand functionality, causing discomfort, restricted movement, and a noticeable weakening of grip strength. Often weakening, this inflammation-induced illness can hamper daily activities and compromise overall quality of life. Among this challenging scenario, the promising approach of dynamic taping has gained recognition as an effective intervention to alleviate these distressing symptoms. To identify the effect of dynamic taping on pain, disability, and grip strength among patients with De Quervain tenosynovitis. Five patients between 25 and 45 years of age who were treated with dynamic taping for De Quervain's tenosynovitis were included in the study. The pain, disability, and grip strength scores before and after the implementation of dynamic taping were assessed in all patients. The pain was measured using the Visual Analog Scale (VAS), disability was measured by a patient-rated wrist/hand evaluation questionnaire and grip strength was measured with the help of a Jamar dynamometer. The differences between the pre treatment and post treatment scores were observed to determine

the efficacy of dynamic taping in the treatment of De Quervain's tenosynovitis.The case series demonstrated that dynamic taping can potentially reduce pain levels, improve grip strength, and decrease disability in patients with De Quervain's tenosynovitis. The promising approach of dynamic taping has gained recognition as an effective intervention to alleviate these distressing symptoms, offering hope for individuals grappling with the burdensome impacts of this wrist ailment.

Keywords: Distressing symptoms, Jamar dynamometer, Wrist pain.

Abstract-48

Beyond the Genome: Integrating Multiomics Approaches in Sports Performance and Rehabilitation: A Narrative Review

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ABSTRACT

Introduction: Athletic performance and recovery result from intricate interactions among genetic, molecular, physiological, and environmental influences. Multiomics technologies including genomics, proteomics, metabolomics, and epigenomics, provide a detailed perspective on how exercise leads to adaptations, shedding light on skeletal muscle remodeling, mitochondrial function, and overall metabolic changes. Genetic variations such as FAAH rs324420 and CYP1A2 underscore the role of genetics in endurance and recovery, while advanced methods like stable isotone offer real-time insights into metabolic processes. By merging diverse datasets, multiomics facilitates precision medicine approaches to enhance training, rehabilitation, and athletic performance, linking molecular findings to practical applications in sports science.

Aim: To find the effect of integrating a multiomics approach in sports performance and rehabilitation.

Materials and Methods: A comprehensive review of studies was performed utilising the databases; Google Scholar (1430) and PubMed (1063). The investigation focused on research published February 2020 to December 2024. The search terms applied in this investigation included "multi-omics," "omic," "genomic," "performance," and "Exercise Performance." Boolean operators ("AND," "OR") were utilised in various combinations such as "MULTI-OMICS" AND "Exercise Performance," and "GENETICS" OR "GENOMICS" AND "Exercise Performance" to enhance the search outcomes. Additionally, the search was filtered by publication year, the English language, and original research articles. Inclusion criteria included all the papers on genetics/genomics/multiomics/ proteomics, metabolomics, and epigenomics on sports performance and/ or sports rehabilitation. Exclusion criteria included all papers not in English, and papers January 2020.

Results: It is evident from all the literature in hand that genetics/ genomics does have a role in sports performance and if used in integration with multiomics the results for athletic performance and athlete-based rehabilitation will take a positive turn.

Conclusion: Although multiomics methods have revolutionised sports sciences, there are still obstacles to overcome, such as the interaction of extensive and varied datasets and the confirmation of results in different populations. New technologies, like single-cell omics and machine learning, hold the potential to improve the interpretation and usability of data.

Keywords: Athletic performance, Proteomics, Transcriptomics, epigenomics.

Conservative Physiotherapy Management of Inferior Shoulder Dislocation: Enhancing Quality of Life, Sleep, Range of Motion, Muscle Strength, Reflexes, and Pain – A Case Study

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ABSTRACT

Introduction: Inferior shoulder dislocation is an uncommon injury but has been increasingly reported, often associated with concomitant injuries to the shoulder stabilizers, greater tuberosity fractures, and neurovascular impairments. While existing literature predominantly emphasizes surgical reduction under anesthesia, this case report highlights a conservative physiotherapy-based approach aimed at improving pain, range of motion (ROM), muscle strength, reflexes, sleep quality, and overall quality of life. A 28-year-old male presented with a traumatic inferior shoulder dislocation, exhibiting an adducted and internally rotated shoulder posture, severe pain, sensory alterations, and significant limitations in performing activities of daily living. Imaging revealed a partial supraspinatus tear, subacromial impingement, bursitis, glenohumeral joint effusion, and a SLAP lesion, while nerve conduction velocity studies confirmed brachial plexus neuritis affecting the C5-C6 trunk. Initial clinical findings included severely restricted ROM (10°-20°), profound muscle weakness (MMT 1/5), absent reflexes, altered sensations, extreme pain (VAS 10), and poor functional scores (SPADI 93%, DASH 95%).

A structured 4-month physiotherapy intervention was implemented, divided into four progressive stages: pain management and ROM restoration; strength training with isometric and proprioceptive neuromuscular facilitation (PNF) techniques; resistance exercises for strength maintenance; and scapular stabilization for functional strength enhancement. The patient demonstrated remarkable improvements, including complete pain resolution (VAS 0), sensory normalization, improved muscle strength (MMT 4/5), substantial reduction in SPADI (40%) and DASH (32.5%) scores, along with enhanced sleep and quality of life. This case underscores the efficacy of conservative physiotherapy in successfully managing complex inferior shoulder dislocations with associated soft tissue and neural injuries, offering functional recovery without surgical intervention.

Keywords: Inferior dislocation, Brachial plexus injury, SLAP tear, physiotherapy rehabilitation, conservative management.

Abstract-50

Effect of Walking Speed on Spatiotemporal Parameters with and without Shoes at varying Walking Speeds

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ABSTRACT

Introduction: Spatiotemporal gait parameters are essential for understanding human locomotion, as they reflect variations in force distribution, balance, and movement efficiency. Walking speed and footwear significantly influence these parameters, affecting the stance phase, swing phase, step length, velocity, and step width.

Aim: To examine how changes in walking speed influence the gait characteristics under both barefoot and shod conditions.

Materials and Methods: A total of 66 trials were conducted in November 2024 in the BioMechanics Lab at the Centre of Excellence (CoEs), Footwear Design and Development Institute (FDDI), Rohtak, Haryana. During the experiment, 33 trials were conducted in barefoot conditions and 33 with shoes. Participants walked at speeds of 4.66 km/hr, 5.29 km/hr, and 6.48 km/hr. Data were recorded using Simi Motion Version 9.2.1 (Build 365) at a sampling frequency of 100 Hz. The participants had a meanage of 20.67±1.528 years, mean height of 1.68±0.108 m, and mean weight of 66.17±14.580 kg. Spatiotemporal gait parameters, including stance phase, swing phase, step length, step width, and velocity, were examined in both conditions.

Results: The results indicate a clear relationship between walking speed and gait variations. As speed increased, stance phase duration decreased, while the swing phase increased, suggesting reduced ground contact time and increased neuromuscular control demands. Step length was slightly higher in shod conditions, indicating improved stability with footwear. Velocity increased proportionally with speed, demonstrating natural gait adaptation, while step width remained stable across conditions, highlighting consistent lateral stability.

Conclusion: The results provide insights for clinical gait assessments, rehabilitation, and footwear design, contributing to improved movement efficiency and balance.

Keywords: Gait parameters, walking speed, footwear, stance phase, biomechanics.

Abstract-51

Efficacy of Blood Flow Restriction Training as a Novel Treatment Approach for Musculoskeletal Conditions: A Scoping Review of Existing Literature

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ABSTRACT

Introduction: Blood Flow Restriction Training (BFRT) helps to reduce pain and improve muscle strength and hypertrophy within low intensity by occluding the arterial inflow partially and full restriction of venous outflow, especially in the population who are contraindicated to High-intensity Resistance Training (HRT). However, there is a lack of study on BFRT that can hence be used to treat musculoskeletal conditions.

Aim: To summarise the current available evidence on the efficacy of BFRT as a novel treatment approach for musculoskeletal conditions as well as to identify the gaps in the literature that may require further research.

Materials and Methods: The following databases were searched systematically– PubMed, MEDLINE, PROSPERO, and PEDro. Articles were included if they described BFRT as a primary intervention.

Results: The BFRT is an effective treatment approach in musculoskeletal conditions and it is also a novel treatment approach. This scoping review suggests that BFRT can be included in the treatment for conditions like osteoarthritis, low back pain, Anterior Cruciate Ligament (ACL) injury, rheumatoid arthritis, and other conditions as well. There is a lack of research on the use of BFRT as a treatment approach and hence there is a need for more qualitative research that needs to be done on the same.

Conclusion: Low-load BFRT is an essential treatment approach, that can be used in musculoskeletal conditions. People contraindicated to high-intensity or high-load training, can adopt low-load BFRT as a primary intervention. This scoping review revealed that there is a lack of qualitative studies to identify the effectiveness of BFRT among patients.

Keywords: Musculoskeletal disorders, Muscle strength, Osteoarthritis, Venous outflow.

Abstract-52

Physiotherapy Interventions for Foot and Ankle Disorders: A Scoping Review

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ABSTRACT

Introduction: Mobility, balance, and quality of life are all impacted by foot and ankle conditions like diabetic foot, plantar fasciitis, Achilles tendinopathy, and ankle sprains. For pain management and functional recovery, physiotherapy therapies such as manual therapy, shockwave therapy, neuromuscular training, and therapeutic

exercises are frequently employed. To map the efficacy and reach of various interventions, a systematic review is necessary.

Aim: To identify common treatment techniques, their efficacy, and research gaps, this scoping review will compile and evaluate the available data on physiotherapy therapies for foot and ankle problems.

Materials and Methods: A thorough search of PubMed, Scopus, and Google Scholar was carried out in accordance with PRISMA-ScR criteria. The keywords included "physiotherapy", "foot disorders," "ankle rehabilitation," along with "podiatric physiotherapy interventions." After eliminating duplicates, 475 of the 510 discovered articles underwent screening. Total 45 papers satisfied the inclusion criteria following a full-text review. Study design, demographics, types of interventions, and results were the main topics of data extraction.

Results: A 45 studies on physiotherapy therapies for foot and ankle diseases were considered in this analysis. The most popular treatments, which showed improvements in pain, function, and mobility, included therapeutic exercise, manual therapy, shockwave therapy, and neuromuscular training. For persistent plantar fasciitis, shockwave therapy proved especially beneficial, and neuromuscular training enhanced stability and reduced the risk of damage. Direct comparisons are, however, limited by the diversity of study designs, underscoring the necessity of standardised research.

Conclusion: By lowering discomfort and enhancing function, physiotherapy treatments efficiently treat foot and ankle conditions. However, more high-caliber research is required to evaluate long-term results and standardise treatment techniques.

Keywords: Ankle rehabilitation, Manual therapy, Shockware theraphy, Therapeutic exercise.

Challenges Faced by Pregnant Women during First Trimester while Lockdown after Second Wave of COVID-19 Pandemic: A Cross-sectional Study

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ABSTRACT

Introduction: The Coronavirus disease 2019 (COVID-19) pandemic has significantly impacted maternity care, maternal support systems, and women's mental health. Pregnant individuals faced a range of psychological, physiological, and emotional challenges, exacerbated by concerns about infection risks. Heightened anxiety and stress were widespread, primarily driven by fears for personal safety and foetal well-being. However, the perceived severity of these impacts and the associated fear were comparatively lower during the second wave than during the initial outbreak.

Aim: To assess the challenges faced by pregnant women in their first trimester during the lockdown period following the second wave of the COVID-19 pandemic.

Materials and Methods: A total of 95 pregnant women, aged 22-30 years, were recruited based on inclusion criteria. A self-reported questionnaire was administered to evaluate the difficulties encountered by these women during their first trimester under lockdown conditions.

Results: Among the 95 participants (mean age: 25.7 years), 45.3% reported a persistent fear of preterm birth, 52.9% expressed significant concerns about perinatal complications, 38.9% experienced considerable psychological distress throughout pregnancy due to the pandemic, 58.9% reported anxiety about contracting COVID-19 during hospital visits for routine prenatal care.

Conclusion: This study highlights the substantial psychological burden experienced by pregnant women during the pandemic. Stress, fear of preterm labour, concerns about perinatal complications, and anxiety about hospital-acquired infections were identified as predominant challenges. These findings emphasise the urgent need for targeted psychological support and improved healthcare strategies to mitigate maternal distress during global health crises.

Keywords: Psychological distress, Prenatal complications, Preterm birth

Personalised Solutions for Foot Health: Machine Learning-based Foot Condition Detection, Classification, and Recommendation of Customised Footwear

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ABSTRACT

Introduction: Foot conditions such as plantar fasciitis and flat feet afflict millions worldwide and often create mobility issues as well as major health complications. Authors propose a machine-learning solution to detect and classify foot conditions and further recommend suitable footwear.

Aim: To develop an Artificial Intelligence (AI)-driven system that can effectively detect foot conditions with machine learning and recommend personalised footwear. This will enhance mobility and prevent complications through early diagnosis and customised footwear design for it.

Materials and Methods: The system leverages three major datasets: (1) a grayscale pressure sensor heatmap dataset for clinical gait analysis for nine-foot posture categories; (2) a physiotherapist-verified foot condition symptom dataset; and (3) a footwear recommendation dataset specifying foot condition-specific features. The system consists of three modules. First, a Convolutional Neural Networks (CNN)-based Visual Geometry Group (VGG)-16-Gated Recurrent Unit (GRU)-based foot disease classifier classifies eight gait postures with an accuracy of 98.34%. Then, based on the symptoms obtained from the symptoms dataset, the auto-encoder-based random forest model identifies the foot conditions appropriately. Secondly, an Long Short-Term Memory (LSTM) Ensembled XGBoost Model provides footwear recommendations based on the identified foot condition. We suggest agentic AI to create realistic custom footwear images, evaluating Stable Diffusion and DALL-E for the best design rendering.

Results: Experimental results show high accuracy: the detection model achieves 98.33% F1-score and 98.34% Recall, and the recommendation system achieves 0.89 Medical Record Review (MRR). DALL E ensures realistic design and improves recommendation quality, transforming AI-driven foot health solutions.

Conclusion: The proposed work improvises the detection of foot disease, classification, and footwear recommendation. Enhanced diagnosis maximises footwear recommendation and revolutionises AI-based foot care solutions.

Keywords: Foot disease detection; Personalised footwear design; Long short-term memory; Pressure sensor heatmaps; DALL-E system.

Abstract-55

Simulation-based Analysis of Environmental Conditions and Material Mechanical Properties for Optimising Impact Force Absorption in Footwear Design

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ABSTRACT

Introduction: Footwear plays a crucial role in reducing the impact forces experienced by the human body during movement. Integrating energy-absorbing materials into insoles can significantly mitigate these forces, reducing the perceived weight by 25-50%. The present study focuses on evaluating the impact absorption capabilities of seven insole materials-D3O, Ethylene Vinyl Acetate (EVA), Cambion, Polyurethane (PU) Gel, Sorbothane, Microcellular Rubber (MCR), and Poron Pain Pressure Threshold (PPT)-under varying dynamic impact forces and environmental conditions. These materials were selected based on their widespread use in footwear for impact reduction and pressure distribution.

Aim: To determine the most effective material for impact mitigation, assess how temperature variations (40±5°C) influence material properties, and optimize insole design for enhanced biomechanical efficiency.

Materials and Methods: Finite Element Analysis (FEA) was performed using Ansys 2025, which includes advanced non-linear material modeling and transient dynamic analysis. A plain insole model with a fixed bottom surface was subjected to dynamic forces replicating walking and running conditions across different terrains. The materials were tested at three temperature conditions (35°C, 40°C, and 45°C), with properties such as Young's modulus, density, Poisson's ratio, and damping coefficients incorporated for accurate simulation. The study evaluates deformation, stress distribution, and energy absorption to understand material behaviour under real-world conditions.

Results: The results shows that PU Gel exhibited the highest energy absorption (34.284 mJ) with minimal deformation (0.15057 mm), making it ideal for high-impact applications. EVA and Poron also showed significant strain energy absorption (33.076 mJ) but with higher deformations (6.6886 mm), indicating their suitability for cushioned support. Sorbothane R and D3O R had lower strain energy values (3.8093 mJ and 2.0979 mJ, respectively), with D3O R showing moderate deformation (5.6071 mm). MCR displayed the highest deformation (9.2303 mm), suggesting its adaptability but reduced durability under extreme loads. Cambion, with the lowest strain energy (1.8909 mJ), provided firm support but limited impact absorption. Higher temperatures led to increased deformation across all materials, impacting their overall effectiveness.

Conclusion: The study provides the insights into optimising insole materials for durability, comfort, and enhanced impact resistance.

Keywords: Footwear biomechanics, Energy-absorbing materials, Finite element analysis, Dynamic impact forces.

Abstract-56

Impact of PNF Stretching and Mobilisation on Pain, Handgrip Strength, and Quality of Life in Cervical Radiculopathy- A Clinical Trial Insights

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ABSTRACT

Introduction: Cervical radiculopathy is a clinical condition resulting from the compression or irritation of the cervical spinal nerves, generally characterised by pain, sensory deficits, and motor weakness in the upper limbs. Proprioceptive neuromuscular facilitation stretching hold relax technique integrates an isometric contraction but allows a longer duration for the muscle to relax before the stretch is applied. The mobilization techniques include a series of manual therapy approaches aimed at improving joint function, relieving pain, and facilitating the healing process through better circulation and mobility.

Aim: To know about the effect of PNF stretching and mobilisation on pain, handgrip strength, and Quality of Life (QoL) in patients with cervical radiculopathy.

Materials and Methods: A total of 50 subjects, aged between 18 to 35 years participated in the study by random sampling method, sample size was calculated using G power. Subjects were randomly and equally assigned to an experimental group A, receving Hot pack, transcutaneous electrical nerve stimulation, PNF stretching and mobilisation and Group B and conservative therapy receving Hot pack, transcutaneous electrical nerve stimulation, isometric exercise for four weeks. Pre and post-assessment pain by the numeric pain rating scale, handgrip strength by dynamometer, quality of life by the World Health Organization Quality of Life brief version, and upper limb function by Upper extremity functional index. Data were analysed using an Independent T-test.

Results: The significance level (alpha) was predetermined (e.g., p-value <0.05) to determine the statistical significance of the results and the confidence level was 95%. The mean difference score for the numeric pain rating scale was 3.08333333, for the dynamometer was -6.9216667, for QoL -2.9999997, and for the Upper extremity functional index it was -13.45833337 respectively. The result showed a statistically significant change. However, the intervention shows very small changes in quality of life.

Conclusion: This study concluded that PNF stretching and mobilisation are beneficial for pain, hand grip strength, and QoL in patients with cervical radiculopathy.

Keywords: Hot pack, Transcutaneous electrical nerve stimulation, Joint function.

Abstract-57

Comparison of MFR and Traditional Physiotherapy Management of Non-specific Chronic Low Back Pain: A Comparative Study

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ABSTRACT

Introduction: Chronic low back pain is a prevalent and debilitating condition affecting millions worldwide, significantly impacting the quality of life and placing a substantial burden on healthcare systems.

Aim: A comparative study to evidence the prevalence and severity of symptoms for non-specific chronic back pain among long-setting nonspecific chronic low back pain of the adult population.

Materials and Methods: This cross-sectional study sample consisted of 40 participants. They were the ones who long settings more than 4 hrs. continue per day Selected 40 Participants will be divided into two groups- Group A–20 subjects (MFR treatment provided) and Group B-20 Subjects (IFT and US treatment provided) Treatment will be provided to the selected participants for the 3 sittings per week, for over 1 month(4weeks).

Results: MFR dramatically lowered pain intensity in patients, according to the t-test findings but its effects do not last long as compared to MFR and IFT, UST hasa long-term effect in lowering chronic low back pain. The MFR can significantly improve lumbar range of motion and quality of life. Whereas, Ultrasound therapy has great effectiveness in reducing the intensity of pain.

In summary, the study meticulously examined the data of 40 participants, focusing on non-specific chronic low back pain. The analysis revealed a significant difference in the MFR and ultrasonic therapy and interferential current variable between the two groups, with Group 1 (MFR) comprising 20 participants and Group 2 (UST) consisting of 40 participants. The study explored the mean age of the participants, identifying a slight variance between the two groups. Moreover, the application of the SLR test emphasised the significance of variances in the MFR and SUT, and IFT values, further highlighting the potential impact of these.

Keywords: Myofascial release, Latent, Trigger point, Exercise

Abstract-58

Performance of Six Minute Walk Test and Grip Strength Correlation among Healthy Young Individuals

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ABSTRACT

Introduction: Understanding the relationship between aerobic capacity and muscle strength in young adults can provide insights into physical fitness assessment and intervention planning.

Aim: To evaluate the performance of the Six Minute Walk Test (6MWT) among healthy young individuals across different age groups.

Materials and Methods: Participants were divided into three age groups: 15-21 years, 22-28 years, and 29-35 years, with 46 subjects in each group. The 6MWT was conducted in a standardised indoor corridor, and grip strength was measured using the Jamar Plus+ Digital Hand Dynamometer. The research used Statistical Package for the Social Sciences (SPSS) software. Initially, the mean, standard deviation, and range for various variables were calculated, including the six-minute walk test distance covered and grip strength tests for both dominant and non-dominant hands across all age groups and genders. An Analysis of Variance (ANOVA) test was used to determine the differences between the groups. A specified significance threshold, set at p-value <0.05, was used for all statistical tests to appropriately interpret the data.

Results: The 15-21 years group showed the highest mean distance in the 6MWT (658.96 M), followed by the 22-28 years group (611.55 M) and the 29-35 years group (604.96 M), with significant differences between groups (F=0.734, p-value=0.02). The 15-21 years group also had the highest mean dominant hand grip strength (40.39 kg) and non-dominant hand grip strength (27.35 kg). Pearson correlation analysis revealed a weak negative correlation between 6MWT performance and dominant hand grip strength (r-value=-0.207, p-value=0.015), while no significant correlation was found with non-dominant hand grip strength.

Conclusion: This study highlighted significant differences in 6MWT performance and grip strength among healthy young individuals across age groups. Younger individuals demonstrated better aerobic capacity and muscle strength. The weak negative correlation between 6MWT performance and dominant hand grip strength suggests that these measures assess different aspects of physical fitness.

Keywords: Aerobic capacity, Dominant handgrip, Non-dominant handgrip, Physical fitness.

Abstract-59

Effect of Craniosacral Therapy on Cervicogenic Headache: A Review

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ABSTRACT

Introduction: The classification of headache disorders is based on the International Classification of Headache Disorders (ICHD-3). Cervicogenic headache is a unilateral headache, and pain that begins in the neck or occipital region. Contraction Stress Test (CST) is commonly used to treat headaches, back and neck pain, mental health, and stress-related issues. This approach employs standardised applications of mild fascia traction, release, and relaxation techniques based on individual palpation limitations, releasing limitations, and adjusting the skull and spine until pelvic balance.

Aim: To determine the effectiveness of craniosacral therapy on cervicogenic headaches to avoid recurrent neck discomfort.

Materials and Methods: A literature review was performed using databases: PubMed, Google Scholar, Scopus, and The Cochrane Library. To perform the search, these MeSH terms used were: "Cervicogenic headache" AND "Neck pain" AND "HIT-6" AND "Craniosacral therapy" between from month January to December.

Results: The review contained certain papers. Overall, published research shows that between 97.5 and 100 percent of patients found the treatment satisfying and effective for pain. CST is very safe and effective for reducing neck pain. Additionally, it may improve functional impairment and quality of life, balance, and help in muscle relaxation. CST could be a useful therapeutic alternative in addition to traditional medical therapy.

Conclusion: According to the review, cervicogenic headaches are effectively treated with CST and help to reduce the risk of recurrent neck discomfort.

Keywords: International classification of headache disorders, Neck pain, Qulity of life.

Abstract-60

Role of Biomechanics in Advancements in Neurological Technologies for Gait Rehabilitation Following Transient Ischaemic Attack

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ABSTRACT

Introduction: Transient Ischaemic Attack (TIA) is traditionally considered a reversible ischaemic event; however, many patients exhibit persistent gait abnormalities beyond six months post-attack. These include slow and cautious gait, stride asymmetry, postural instability, and freezing episodes, resembling features of vascular parkinsonism or corticospinal tract dysfunction. Possible gait abnormalities seen after a TIA include Trendelenburg gait, foot-dragging, decreased step length, impaired balance, and slowed gait speed. As conventional physiotherapy provides limited functional restoration, emerging neurological technologies offer novel avenues for intervention.

Aim: To conduct a scoping review to map current neuro technologies used for post-TIA gait rehabilitation, followed by a systematic review to assess their efficacy.

Materials and Methods: This scoping review follows PRISMA-ScR guidelines and EQUATOR Network recommendations. A thorough search was performed in PubMed, Scopus, and Web of Science for studies published between January 2013- January 2023. Eligibility criteria included studies focused on post-TIA gait dysfunction treated with neurorehabilitation technologies. Two independent reviewers screened studies and extracted data. Key themes explored include Brain-Computer Interfaces (BCIs), non-invasive brain stimulation (TMS/tDCS), AI-driven Virtual Reality (VR) gait training, and bioelectronic medicine (vagus nerve stimulation and functional electrical stimulation). This review provided an overview of existing interventions and their applications. Following PRISMA and EQUATOR Network guidelines, the systematic review evaluated the efficacy of these technologies. The search strategy used terms like "Transient Ischaemic Attack," "Gait Rehabilitation," and "Neuroplasticity." Randomised controlled trials and cohort studies were included. The data synthesis involved narrative analysis where applicable.

Results: The scoping review identified 120 studies, categorised by intervention type. From 250 initially screened articles, 43 met systematic review inclusion criteria. Findings indicate that BCI-integrated robotic gait training enhances neuroplasticity and motor relearning, while non-invasive brain stimulation (TMS/tDCS) modulates cortical excitability. AI-driven VR gait rehabilitation improves gait speed and reduces fall risk. Functional Electrical Stimulation (FES) and Vagus Nerve Stimulation (VNS) improve balance and symmetry.

Conclusion: The scoping review mapped available interventions, and the systematic review evaluated their effectiveness. Although there is no definitive cure, neurotechnological and AI-assisted rehabilitation techniques show considerable potential. Future research should incorporate multimodal approaches and follow EQUATOR Network guidelines for optimal outcomes.

Keywords: Brain-computer interface, Neuroplasticity, Motor relearning, Rehabilitation, Neuromodulation

Abstract-61

Combined Effects of Static Stretching and Ergonomic Modifications on Forward Head Posture among Deskjob Employees

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ABSTRACT

Introduction: Ergonomics is the science of designing a workplace to maximise employee productivity while ensuring they feel safe, secure, and comfortable at their desks. Ergonomics often focuses on matching the job to the person rather than the task to the individual.

Aim: To investigate the impact of static stretching and ergonomic adjustments on workers' forward head posture.

Materials and Methods: The study was a pre-post-test experimental design. There were 30 participants with forward head posture randomly assigned to two groups. All participants will undergo three sets of static stretching per day, with 10 repetitions per set, four times each week for three weeks. Group A received static stretching along with ergonomic adjustments, while Group B received ergonomic modifications and general physical activity. The

outcome measures were craniovertebral angle and Numeric Pain Rating Scale (NPRS) scores.

Results: After giving three weeks of intervention by assessing through craniovertebral angle and NPRS scores we found that group A has a more effect than group B, the p-value p=0.04 for both groups was less than 0.05 showing that there were significant changes in the post data.

Conclusion: Static stretching combined with ergonomic modifications has greater benefits than ergonomic modifications with general activities; however, both stretching and ergonomic modifications, as well as ergonomic modifications with general activities, have significant effects on forward head posture among desk job employees.

Keywords: Forward head posture, Static stretching, Ergonomic modifications, Desk job employees.

Abstract-62

Gender Specific Muscle Imbalance Patterns in Elite Junior University Badminton Players: A Comprehensive Study

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ABSTRACT

Introduction: Muscle imbalance refers to uneven strength between opposing muscle groups or between the dominant and non-dominant sides of the body. In overhead sports like badminton, muscle imbalances are common due to repetitive unilateral movements such as smashes and serves. These imbalances, particularly between the internal and external shoulder rotators, increase the risk of injuries, including tendinopathies and rotator cuff issues. Research suggests that the dominant shoulder often exhibits greater strength due to overuse, potentially impacting performance and increasing injury risk. Despite these findings, limited research explores gender differences in muscle imbalances among elite badminton players.

Aim: To investigate muscle imbalances between the dominant and non-dominant shoulders of elite junior university badminton players and to explore gender differences in these imbalances.

Materials and Methods: A comprehensive cross-sectional study was conducted with 40 elite junior university badminton players (20 males and 20 females), aged 18-25 years, with at least three years of competitive badminton experience and active training at least five times per week. Players with chronic musculoskeletal disorders or recent injuries were excluded. Muscle strength was measured using a hand-held dynamometer. After a five-minute light aerobic warm-up and dynamic stretching, the following muscle groups were tested: shoulder internal/external rotators, shoulder abductors/adductors, and shoulder flexors/extensors. Peak torque was measured at angular velocities of 60°/s and 180°/s to assess muscle strength and asymmetry between the dominant and non-dominant shoulders. Gender differences in muscle imbalance patterns were also analysed.

Results: Male players showed significantly p=0.003 greater strength dominance in the internal rotators of the dominant shoulder, indicating a higher degree of muscle imbalance compared to females. Female players exhibited less upper-body asymmetry. These findings highlight gender-specific muscle imbalance patterns, which could influence performance and injury risk in elite badminton players.

Conclusion: There is significant gender-specific muscle imbalance patterns in elite junior university badminton players, emphasising their impact on performance and injury risk. Male players exhibited greater upper-body strength asymmetry, particularly in the shoulder rotators.

Keywords: Gender differences, Strength asymmetry, Sports performance.

Abstract-63

Effects of Self-stretching Exercises on Managing Lower Back Pain among Young Adulthood Newbie Male Gym Goers

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ABSTRACT

Introduction: Lower back pain is a common issue among adult male beginners in gym workouts, often caused by overworked or strained muscles as they adjust to new exercises. This discomfort can hinder their consistency and progress in fitness routines. Self-stretching exercises are known to relieve muscle tension, improve flexibility, and enhance functional mobility, potentially reducing lower back pain. However, limited research has focused on the effectiveness of self-stretching routines for managing lower back pain among young male gym beginners.

Aim: To evaluate the effectiveness of self-stretching exercises in reducing lower back pain, improving flexibility, and enhancing functional mobility among young adult male gym beginners.

Materials and Methods: This study was a quasi experimental pre-post study. The study was conducted in the Physiotherapy OPD after identifying the gym goers in the Galgotias University between the period of November 2024 to January 2024 after getting CTRI registration (CTRI/2024/11/076435). A total of 60 male gym beginners (aged 18-30) with less than six months of gym experience and mild to moderate lower back pain were recruited. Participants with severe pain requiring medical intervention or recent back injuries/surgeries were excluded from the study. Participants followed a structured self-stretching routine for six weeks, three times per week, after a five-minute warm-up. The routine included: Cat-Cow Stretch- three sets of 10 repetitions, seated forward bend- three sets, holding for 30 seconds each, Child's pose- three sets, holding for 30 seconds, standing hamstring stretch- three sets, holding for 30 seconds, lower back rotational stretch- three sets of 10 repetitions per side. The Outcome measures included the Visual Analog Scale (VAS): For pain level assessment, the Sit-and-Reach Test: To evaluate flexibility, Oswestry Disability Index (ODI): To measure functional mobility. Paired t-tests were used to compare pre-and post-intervention pain levels, flexibility scores, and functional mobility outcomes, with a significance level of p-value <0.05.

Results: Participants showed a significant decrease in lower back pain, along with improvements in flexibility and functional mobility (p-value <0.05). These findings indicate that a structured self-stretching routine can effectively manage lower back pain and enhance functional outcomes in young adult male gym beginners.

Conclusion: The structured self-stretching routine can effectively reduce lower back pain, enhance flexibility, and improve functional mobility among young adult male gym beginners.

Keywords: Flexibility, Gym beginners, Visual Analog Scale, Oswestry Disability Index.

Abstract-64

A Comparative Study on Role of Pilates Exercise in Improving Core Strength and Stability among Young University Adults

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ABSTRACT

Introduction: Core strength and stability are vital for physical fitness, posture, and injury prevention. The core muscles, including the abdominals, lower back, and pelvic stabilisers, support functional movements and athletic performance. Weak core muscles can lead to poor posture, lower back pain, and a higher risk of injury. Pilates exercises are known to enhance core strength and stability, but their effectiveness among young adults remains under-researched.

Aim: To compare the effectiveness of Pilates exercises in improving core strength and stability among young university adults.

Materials and Methods: It is a comparative interventional study. Sixty healthy university students (aged 18-25 years) with no prior Pilates experience and equal Body Mass Index (BMI) were recruited. Participants were divided into two groups: 30 in the Pilates group and 30 in the control group. The Pilates group attended three 45-minute sessions per week for eight weeks, performing exercises such as the Hundred (core endurance), plank variations (core stabilization), single-leg stretch (lower abdominal activation), bridge pose (gluteal and pelvic stability), and leg circles (hip and lower core control). The control group continued their usual fitness routines without specific core training. Outcome measures included the Plank Endurance Test for core strength and the Y Balance Test for stability, assessed before and after the intervention. Paired t-tests were used for within-group comparisons, and independent t-tests were used for between-group analyses.

Results: The Pilates group showed significant improvements in both core strength and stability compared to the control group (p-value <0.01). These findings suggest that pilates effectively enhances core muscle function among university students, promoting better posture and reducing injury risk.

Conclusion: This study demonstrates that Pilate's exercises significantly enhance core strength and stability among young university adults. Participants pilate reformity adults showed substantial improvements in plank endurance and dynamic stability, outperforming the control group engaged in general fitness activities.

Keywords: Leg circles, Pelvic stability, plank endurance test, Y balance test, university students.

Abstract-65

Effect of Mindfulness Training Versus Moderate Aerobic Training in Improving Postpartum Blues among Primiparous Mothers- An Experimental Study

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ABSTRACT

Introduction: Postpartum blues or depression is a prevalent mental health concern that affects many first-time mothers, leading to emotional distress and potential challenges in newborn care. Conventional treatments for Postpartum Depression (PPD) typically include medication and psychotherapy; however, there is increasing interest in alternative and complementary methods such as mindfulness training and moderate aerobic exercise. Mindfulness training involves techniques that encourage present-moment awareness and acceptance, which can help reduce stress and enhance emotional regulation. Research indicates that mindfulness-based interventions effectively alleviate symptoms of depression and anxiety by fostering a non-judgmental awareness of thoughts and emotions. Similarly, moderate aerobic exercise is well known for its positive effects on both physical and mental well-being. Engaging in regular physical activity promotes the release of endorphins and other neurotransmitters associated with improved mood, potentially helping to reduce depressive symptoms.

Aim: To assess the baseline severity of postpartum blues in primiparous mothers using the Edinburgh Postnatal Depression Scale (EPDS) and evaluate the impact of mindfulness training on postpartum blues symptoms over a four-week intervention period.

Materials and Methods: This experimental study included 80 primiparous mothers diagnosed with postpartum blues, randomly allocated into two groups. The mindfulness training group participated in guided mindfulness sessions focusing on breath awareness and emotional regulation for 30 minutes, five times per week for four weeks. The aerobic training group engaged in moderate-intensity aerobic exercises such as brisk walking and cycling, also for 30 minutes, five times per week for four weeks. The primary outcome was measured using the EPDS at baseline and after the intervention. Statistical analysis was conducted using paired and independent t-tests to assess within-group and between-group differences.

Results: Both mindfulness and aerobic training significantly (p=0.003) reduced postpartum blues symptoms in primiparous mothers.

Conclusion: Mindfulness training and moderate aerobic exercise are effective in reducing postpartum blues symptoms in primiparous mothers. Mindfulness training showed a superior effect, suggesting its potential as a primary intervention for emotional regulation during the postpartum period.

Keywords: Postpartum depression, Edinburgh postnatal depression scale, Mental well-being.

Abstract-66

Physiotherapy in ICU Patients with Obstructive and Restrictive Lung Diseases: A Systematic Review of Impact and Outcomes

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ABSTRACT

Introduction: Respiratory diseases, such as obstructive and restrictive lung disorders, have a profound effect on individuals and healthcare systems globally. In Intensive Care Unit (ICU) settings, physiotherapy is essential for managing these conditions, utilising techniques like airway clearance, breathing exercises, and early mobilisation to enhance lung function and improve patient outcomes.

Aim: To assess the effectiveness of physiotherapy interventions in adult ICU patients with obstructive and restrictive lung diseases, emphasising recovery, respiratory function, and overall outcomes. It seeks to compile evidence on essential physiotherapy techniques such as airway clearance, breathing exercises, and mobilisation.

Materials and Methods: This systematic review was conducted in accordance with the PRISMA guidelines to evaluate the impact of physiotherapy interventions on adult ICU patients with obstructive and restrictive lung diseases. It included studies that focused on adult ICU patients diagnosed with these conditions, where physiotherapy interventions—such as airway clearance, breathing exercises, mobilization, and pulmonary rehabilitation—were assessed. Only studies published in English between 2015 March to 2024 April were considered.

Results: A total of 63 articles were identified using keywords related to obstructive and restrictive lung diseases, quality of life, ICU-acquired weakness, and physiotherapy. Following the screening of 33 articles, 13 were excluded due to language limitations, lack of full-text access, or irrelevance based on titles and abstracts, and finally 20 relevant studies were analysed after thorough screening. The results emphasise the vital role of physiotherapy in enhancing respiratory function, preventing ICU-acquired weakness, and improving patient outcomes, despite challenges such as restricted access to multilingual research.

Conclusion: The early physiotherapy plays a crucial role in reducing ICU-acquired weakness, enhancing functional outcomes, and improving the quality of life in critically ill patients. Emphasising early rehabilitation in ICUs can promote faster recovery, decrease hospital stays, and lead to better long-term outcomes.

Keywords: Chest physiotherapy, Pulmonary rehabilitation, Breathing exercises, Airway clearance, Early mobilisation.

Abstract-67

Prevalence and Risk Factors of Varicose Veins among Female Homemakers: A Cross-sectional Study Comparing Rural and Urban Populations

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ABSTRACT

Introduction: Varicose veins, a common venous disorder, primarily affect the lower limbs, resulting in twisted and enlarged veins due to weakened vein walls and valves. This condition is often associated with occupations requiring prolonged standing, such as homemaking, a role largely overlooked in occupational health research. Female homemakers perform tasks involving long hours of standing and physical labour, making them vulnerable to developing varicose veins.

Aim: To determine the prevalence and identify the risk factors associated with varicose veins among female homemakers, comparing rural and urban populations. This study seeks to assess the influence of lifestyle, occupational workload, and socioeconomic factors on the development of varicose veins, providing insights for targeted preventive and management strategies.

Materials and Methods: A cross-sectional observational study was conducted with 600 female homemakers, aged 25 to 60 years, equally divided between rural and urban areas. Participants were recruited using stratified random sampling from community centres, healthcare clinics, and local homemaker associations. Data collection involved a structured questionnaire covering demographic information, lifestyle factors, and varicose vein symptoms. Clinical examination of the lower limbs was performed using the Clinical Etiology Anatomy Pathophysiology (CEAP) classification, and doppler ultrasound was used for suspected cases.

Results: The overall prevalence of varicose veins was 37%, with urban homemakers showing a slightly higher prevalence (39%) compared to rural homemakers (35%). The main risk factors identified were prolonged standing, higher Body Mass Index (BMI), age, and lack of physical activity. Prolonged standing emerged as the strongest risk factor, particularly during household chores. Urban homemakers had a higher average BMI and more sedentary lifestyles, contributing to their higher prevalence. Despite rural homemakers engaging in more physical labour, their varicose vein prevalence remained high due to excessive exertion without adequate breaks. Most participants were unaware of preventive measures such as leg elevation and compression stockings.

Conclusion: Varicose veins are prevalent among female homemakers, affecting both rural and urban populations. Public health interventions should focus on raising awareness and promoting preventive measures, particularly in urban areas where sedentary lifestyles are more common.

Keywords: Household chores, Lifestyle, Physical labour, Sedentary

Abstract-68

Impact of Burpees Exercise and Yoga Asanas on Physical and Cardiovascular Fitness Among Collegiate Females: A Comparative Study

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ABSTRACT

Introduction: Physical and cardiovascular fitness in young females enhances general health, increases vigor, lowers the risk of chronic illnesses, and fosters mental wellness. Persistent, continuous at different intensities improves a wide range of physiological markers, including anatomical, physical, and biochemical health parameters.

Aim: To find out the comparative effect of burpees exercise and Yoga asanas on physical and cardiovascular fitness among collegiate females.

Materials and Methods: Potential female participants were screened for eligibility to participate. Total 30 Subjects who met the criteria for inclusion and exclusion signed an Informed Consent. Subjects were divided into two groups- Group A performed burpees exercise whereas Group B performed Yoga asanas, specifically surya namaskar. The Body Mass Index (BMI) and fitness of each subject from both groups were measured. Maximal Oxygen Consumption (VO2) Max and squat tests were used as physical and cardiovascular fitness tests. Data was compiled and analysed with appropriate methods.

This comparative study was conducted at Galgotias University from August 2022 to November 2022.

Results: The intervention significantly (p-value <0.005) improved the subject's cardiovascular health and physical fitness. Group A has a greater effect (p-value<0.005) as compared with the subjects of Group B in both physical and cardiovascular health (102.72±47.72>89.82±43.73) and (27.765±1.654>25.865±1.876).

Conclusion: There was a significant improvement in both groups; however, the burpee exercise was found to be more effective than Yoga asan as for both cardiovascular fitness and physical fitness. Further research is required, with a larger sample size of the individuals and a longer duration of the study period.

Keywords: Body mass index, Physical Fitness, Surya Namaskar

Abstract-69

Effect of Inspiratory Muscle Training on Cardiovascular Fitness and Falls Prevention in Elderly Smokers: A Narrative Review

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ABSTRACT

Introduction: Smoking and ageing both raise the risk of falls in older persons by causing deterioration in cardiovascular and respiratory function. Strengthening and enhancing the function of respiratory muscles has been demonstrated to be possible with Inspiratory Muscle Training (IMT). The possible advantages of IMT for cardiovascular fitness and fall prevention are examined in this review, with a focus on the susceptible group of senior smokers.

Aim: To review the evidence from Randomised Controlled Trial (RCTs) investigating the effect of IMT on cardiovascular outcomes and fall prevention in elderly smokers. The review seeks to critically assess the methodological quality and clinical relevance of existing research by following the Scale for the Assessment of Narrative Review Articles (SANRA) guidelines.

Materials and Methods: The articles from Web of Science and PubMed searches, as well as Scopus search tools, were examined in the literature study. In order to ascertain the role of physical therapists in sustainable global health initiatives, a study of the literature includes articles published between January 2024-October 2024. Keywords related to “smoking,” “fall prevention,” “inspiratory muscle strength,” “dyspnoea,” and “elderly” were made easier by the Boolean operators.

Results: The IMT results in statistically significant increases in inspiratory muscle strength, according to the included RCTs. While increases in core stability helped lower the risk of falls, improved diaphragmatic function and enhanced oxygen uptake were linked to improved cardiovascular performance. Though encouraging, the data should be interpreted cautiously due to the observed variation in participant characteristics, intervention duration, and outcome assessments.

Conclusion: The current analysis concludes that cardiovascular fitness and inspiratory muscle training reduce the incidence of falls in elderly smokers.

Keywords: Dyspnoea, Functional capacity, Smoking, Oxygen up take

Abstract-70

Efficacy of Swiss Ball Versus Floor Exercises in Mechanical Low Back Pain: A Comparative Study

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ABSTRACT

Introduction: Mechanical Low Back Pain (MLBP) is one of the most common musculoskeletal disorders, affecting individuals of all age groups. It is primarily caused by poor posture, muscle imbalances, or spinal dysfunction, leading to pain, stiffness, and reduced functional capacity. Exercise therapy is a widely recommended intervention for managing MLBP, aiming to improve core stability, flexibility, and strength.

Swiss ball exercises have gained popularity for their ability to enhance core muscle activation through instability training, potentially improving spinal stability and reducing pain. In contrast, traditional floor exercises provide a stable base for strengthening and flexibility training. However, the comparative effectiveness of Swiss ball exercises versus floor exercises in managing mechanical low back pain remains unclear.

Aim: To gauge the effectiveness of the Swiss ball exercise method to turn down pain, and disability, and its effectualness in meliorating the fortitude in mechanical low back pain patients.

Materials and Methods: This comparative study was conducted at the home premises of the residents in Delhi in 2023. The study population included both males and females with mechanical back pain within the age group of 18-30 years. The study sample size was divided into two groups. Where Group A indulged in the moist heat pact on Swiss ball exercise for straight 15 minutes and whereas Group B received the same moist heat pack and continued the research on the floor exercises to find the hindrance due to elements like VAS, ODI, DEET which was undertaken on very first and the last date. The study was conducted for 4 weeks.

Results: Both groups showed significant improvements in pain, disability, and muscle endurance (p=0.04). Group A (Swiss ball + moist heat) had greater reductions in VAS and ODI scores and higher DEET improvements compared to Group B (floor exercises + moist heat) (p =0.04). While both interventions were effective, Swiss ball training yielded slightly superior gains in core endurance and functional mobility.

Conclusion: In the end, it was observed that both groups A and B were successful in lowering the lower back pain.Increase the fortitude and lower the disorder. Little differences were observed in both groups' pre and post-readings due to dependence on variables.

Keywords: Swiss ball, Low back pain,VAS

Effect of Proprioceptive Neuromuscular Facilitation and Stretching Exercise on Scapular Dyskinesia among Gym Trainees: A Clinical Study

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ABSTRACT

Introduction: Dyskinesia is one of the common musculoskeletal problems encountered by trainees in gyms, defined as abnormal movement of the scapula that might lead to pain and dysfunction in the shoulder region. Proprioceptive Neuromuscular Facilitation (PNF) techniques and strengthening exercises have been applied in rehabilitation for the improvement of muscle function and movement patterns.

Aim: To evaluate the effectiveness of a combined PNF and strengthening exercise program in improving scapular mobility, reducing pain, and enhancing postural alignment in individuals with scapular dyskinesis.

Materials and Methods: A total of 60 gym trainees diagnosed with scapular dyskinesia were randomly assigned to either the intervention group (PNF+strengthening exercises) or the control group (regular gym routine). The intervention was done three times a week for four weeks. The baseline and post-intervention assessments were done with standardised clinical tools to measure scapular dyskinesia severity, scapular kinematics, muscle strength, and functional performance.

Results: The intervention group participants had improvements in terms of scapular mobility, reduction in pain, and postural alignment as compared to the control group. The right-hand angle of the scapula decreased from 2.73±0.729 to 1.73±0.726 (p-value<0.001), and the left-hand angle of the scapula improved from 2.84±0.738 to 1.72±0.822 (p-value<0.001). These results reflect the improvement in the movement and stabilisation of the scapula. Pain reduced significantly in intervension group. This may prove the presence of an analgesic effect of PNF exercises. Another improvement is a better postural alignment, that may contribute positively to musculoskeletal health as well as potentially reduce the incidence of injury.

Conclusion: The present study provides preliminary evidence that a combined PNF and strengthening exercise programme can be an effective intervention for scapular dyskinesis in gym trainees. The results support the inclusion of PNF techniques in training programs to improve musculoskeletal health and prevent injuries. Further, large-scale studies are recommended to validate these findings.

Keywords: Musuloskeletal health, Scapular kinematics, Strengthening exercises, Rehabilitation.

Abstract-72

Ergonomic Risk Assessment of Riding Posture in Motorcyclist's using Ruler Scale

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ABSTRACT

Introduction: Motorcycling is a popular mode of transport, but prolonged riding can pose significant risks to the musculoskeletal health of motorcyclists due to poor ergonomic posture. The riding posture, which often involves extended periods of sitting with specific body angles, can lead to discomfort and long-term health issues, such as back, neck, and shoulder pain. The Rapid Upper Limb Assessment (RULA) scale is a widely recognised tool used to assess the ergonomic risks of various postures and movements.

Aim: This research employs the Rapid Upper Limb Assessment (RULA) tool to evaluate ergonomic risks in rider posture. RULA systematically assesses posture-related risks affecting upper body regions, categorizing these into specific risk levels.

Materials and Methods: This study is an observational survey based which was conducted in an outdoor unbiased urban setting in Guna, Madhya Pradesh, India. Total 100 motorcyclist participants were included. Bike of 98-350 cc engine motorcycle, with a minimum of 40km of daily travel, between the age of 18-55 years with valid licence and minimum of 2 years of bike riding experience in the study. Interviews were conducted, questionnaires were filled out with demographic information, and pain and discomfort levels were measured using the discomfort scoring method and the Visual Analogue Scale (VAS) score as a valid approach. Individuals have been asked to do the toe touch test as a valid technique for determining hamstring flexibility. The RULA scale was used to assess the Musculoskeletal Disorder (MSD) risk level of participants in riding posture on their respective motorcycles.

Results: The participants in this study had moderate to high levels of MSD risk associated with motorcycle riding, and thus, as age and riding experience increase, so does the MSD risk, and the occurrence of spinal deformity may gradually arise (p value is 0.05).

Conclusion: The participants in this study had moderate to high levels of MSD risk associated with increase in age and riding experience and hence the prevalence of spinal deformity will increase in the motorcyclists of Guna district.

Keywords: Age, Discomfort, Rapid upper limbassessment

Abstract-73

Effect of Different Warm-up Exercises on Leg Strength in Male Taekwondo Athletes

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ABSTRACT

Introduction: Warm-up exercises are an integral part of an athlete's routine, particularly in combat sports like Taekwondo, where explosive movements and powerful leg strength are critical for performance. Proper warm-up routines not only prepare the body for physical activity but also enhance muscle function and prevent injury. In Taekwondo, where leg power is central to techniques such as kicks, jumps, and rapid movements, optimizing warm-up exercises to improve leg strength could have a significant impact on athletic performance.

Aim: To examine the effect of various warm-up exercises on leg strength in male Taekwondo athletes.

Materials and Methods: There were 30 participants in the study. Those who didn't meet the inclusion or exclusion criteria were removed from consideration. As a pre-test, the subjects completed a one rep max strength test. Post data was also collected using the One-Repetition Maximum (1 RM) teams test after warm-up exercises. The warm-up exercises included walking lunge, lateral and forward leg swing, Kneeling thoracic twist, brisk walk, and glute bridge abductors.

Results: The result of the study on Taekwondo male subjects has shown significant changes in the 1 RM scores as pre score was 30.00±1.54 which after the session of warm-up workout changes in post results as 45.00±1.722.The p-value of the paired t-test was p-value<0.05 which shows that a significant difference was seen in the subjects so the alternative hypothesis for the study is accepted.

Conclusion: The warm-up exercise had substantial impacts on the individuals, which have significantly boosted their leg strength. More research has to be done on the subjects of various games to better understand their impact in various settings.

Keywords: Brisk walk, Lower extremity, Performance, Sport

Abstract-74

Assessment of Cardiorespiratory Fitness and Stress Level among Mess Workers: A Cross-sectional Study

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ABSTRACT

Introduction: Cardiorespiratory Fitness (CRF) and stress levels are critical health indicators, especially for physically demanding occupations like mess work. Mess workers often experience prolonged standing, heavy workloads, and stressful environments, which may impact their cardiovascular endurance and mental well-being. Despite these concerns, limited research has explored their CRF and stress levels.

Aim: To assess the cardiorespiratory fitness and stress levels among mess workers.

Materials and Methods: A total of 50 mess workers, predominantly male, aged 23 to 47 years, from various shifts and job roles participated in this study. CRF was evaluated using the 6-minute walk test and Chester Step Test, while stress levels were assessed using the Perceived Stress Scale (PSS). Observational assessments documented physical activity, work environment factors, and biometric measurements, including continuous heart rate and periodic blood pressure monitoring during work shifts.

Results: The findings indicated moderate emotional stress levels among participants, suggesting a need for targeted workplace interventions. Continuous monitoring of heart rate and blood pressure provided real-time insights into physiological responses to work-related stressors. Observational data highlighted significant (P=0.04) variations in stress and CRF levels linked to workload intensity, noise exposure, and interpersonal interactions.

Conclusion: The present study underscores the importance of workplace modifications, stress management programmes, and structured physical activity initiatives to enhance the well-being of mess workers. Addressing key occupational stressors, including long working hours, physical exertion, and job instability, could improve both CRF and mental health outcomes. The findings contribute to occupational health research, offering insights for developing workplace wellness programs and public health policies.

Keywords: Occupational stress, Physical activity, Workplace health.

Abstract-75

Impact of Childhood Obesity on Mental Health, Behavioural Challenges, and Quality of Life: A Cross-sectional Study

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ABSTRACT

Introduction: Childhood obesity has become a global health concern, with significant implications for both physical and mental well-being.

Aim: To explore the impact of childhood obesity on mental health, behavioural challenges, and QoL in children aged 6-14.

Materials and Methods: This cross-sectional study included children aged 6 to 14 years, Stratified random sampling was used to select 200 children (100 obese and 100 non-obese children) from urban and semi-urban schools for a cross-comparative survey. The study participants filled various forms of validated questionnaires, such as Paediatric Quality of Life Inventory (PedsQL), Strengths and Difficulties Questionnaire (SDQ), Depression Anxiety Stress Scale–Youth (DASS-Y). The data were analysed using SPSS v28 with ANOVA, Pearson correlations, and independent t-tests.

Results: As compared to children who were not obese, obese children were significantly more stressed ($p<0.001$), anxious ($p<0.001$), and depressed ($p<0.001$). Girls and teenagers between the age of 12 and 14 had more behavioural emotional problems. There were no apparent differences in overall QoL (PedsQL) and behavioural functioning (SDQ). However, emotional distress, such as stress and depression, was moderately positively correlated with BMI.

Conclusion: The need for early interdisciplinary therapies is evident from the strong correlation between childhood obesity and emotional distress, especially in females and early adolescence. Physiotherapists can be extremely important in integrated care for both physical and psychological health in obtaining better outcomes for obese children in conjunction with educators and mental behaviour specialists.

Keywords: Depression, anxiety, stress, mental health, physical health.

Abstract-76

Automated Classification of Diabetic Ulcers and Ordinary Wounds using YOLOv7 for Medical Diagnosis

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ABSTRACT

Introduction: Diabetic ulcers are a major global health concern, contributing to over 80% of lower limb amputations. Nearly one in four diabetic patients develop these wounds, leading to prolonged hospital stays and increased mortality rates. Current diagnostic methods rely on manual inspection, which is slow, subjective, and error-prone. The recent advancements in deep learning and computer vision have paved the way for automated ulcer classification and diagnosis. While models like Convolutional Neural Networks (CNNs), Faster R-CNN, and Efficient Net have been explored, they exhibit limitations such as high computational costs, false positives, and slow inference times. YOLOv7 offers a promising alternative due to its speed and accuracy in object detection.

Aim: To develop an automated classification system for distinguishing between diabetic ulcers and non-ulcer wounds using YOLOv7. The objective is to improve diagnostic accuracy, reduce misdiagnosis rates, and facilitate early intervention for diabetic patients.

Materials and Methods: A dataset comprising 1,140 labeled images, including both ulcer and non-ulcer wounds, was used. Preprocessing techniques such as image augmentation, contrast enhancement, and resizing were applied. The dataset was split into 80% for training and 20% for validation. YOLOv7 was trained using multiple hyperparameter tuning strategies, and its performance was evaluated against Faster R-CNN and EfficientNet using accuracy, precision, recall, F1-score, and mean Average Precision (mAP).

Results: YOLOv7 achieved an accuracy of 92.5%, outperforming Faster R-CNN (88.7%) and EfficientNet (89.4%). The model effectively detected ulcer boundaries, severity levels, and key features. Compared to traditional methods, the rate of misdiagnosis was reduced by 30%.

Conclusion: The present study demonstrates that YOLOv7 can significantly enhance diabetic ulcer classification by improving detection speed and accuracy. The model's application in medical imaging can assist clinicians in early ulcer diagnosis and treatment planning. Future research will explore integrating thermal and infrared imaging, as well as deploying the model on mobile AI platforms for real-time healthcare applications.

Keywords: Wound Classification, YOLOv7, Deep learning, Medical image processing, Object detection, Healthcare AI

Abstract-77

Role of Pelvic Floor Exercises and Diet Supplementation in Primary Dysmenorrhea Among Adolescents- A Systematic Review

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ABSTRACT

Introduction: Primary Dysmenorrhea (PD) is a common condition characterised by chronic pelvic pain related to menstruation. It affects 70-91% of teenagers, starting before menstruation and lasting 8-72 hours. Limited literature is available on sustainable physiotherapeutic non-pharmacological intervention of PD along with diet supplementation.

Aim: To evaluate the role of pelvic floor exercises and diet supplementation in managing primary dysmenorrhea among adolescents.

Materials and Methods: A comprehensive search was conducted on online databases, including Google Scholar, PubMed, Scopus, and Mendeley. Keywords related to "pelvic floor exercise," "diet," and "primary dysmenorrhea" were used. Only Randomized Controlled Trials (RCTs) published in English from January 2014-October 2024 were included. The studies were screened using the Pedro scale, and only those with a score above 5 were selected.

Results: Six articles met the inclusion criteria, demonstrating that Papillary Fibroelastoma (PFE) and certain dietary supplements can alleviate menstrual pain in adolescents with PD. Significant results showed that PFE reduces pain intensity, while Drug Substance (DS) improves Quality of Life (QOL) and reduces pain levels.

Conclusion: This systematic review highlights the potential role of PFE and DS in managing PD among adolescents. Incorporating these non-pharmacological interventions into comprehensive treatment plans can provide a holistic approach to addressing menstrual pain and improving QOL for adolescents with PD.

Keywords: Menstrual pain, Multivitamin, Non-pharmacological intervention, Nutrition, Premenstrual syndrome.

Effect of Transdermal Magnesium on Sleep Quality and Perception of Change in Chronic Neck Pain in an Army Personnel: A Case Report

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ABSTRACT

Introduction: Persistent neck pain is common among military personnel which causes both sleep problems and diminished quality of life. Reports indicate magnesium demonstrates potential effectiveness in relieving pain while sustaining muscle relaxation and nerve operation. From direct skin absorption, we might attain better efficacy of treatment.

Aim: To evaluates sleep duration and pain sensations in Indian army personnel using magnesium as a non-invasive treatment option.

Materials and Methods: The subject, a 43-year-old male Indian army personnel went through three years of persistent neck pain. The medical condition he experienced with moderate to severe intensity led to sleep disturbances and daily functionality problems. Sleep quality at baseline was marked as poor (PSQI score: 12) while functional impairment level was high (NDI: 21/50) alongside moderate quality of life levels (WHOQOL-BREF: 70/100). A four-week daily transdermal magnesium treatment was administered without any changes to his current physical and medical therapy processes. The patient used transdermal magnesium spray on their neck region while performing a structured isometric exercise program during four weeks of nighttime application. The patient received assessments for sleep quality and pain levels together with overall well-being through the PSQI, WHOQOL-BREF, and NDI tests at all timeframe points including baseline, week two, and week four.

Results: Sleep quality together with pain perception exhibited noticeable enhancements for the patient after the intervention was completed. The PSQI score improved to 6 while the NDI score decreased to 6/50 and the WHOQOL-BREF score rose to 75/100. Throughout the intervention, the patient experienced better overall well-being together with easier everyday functioning. All treatment effects remained free of negative side effects during the entire therapeutic period.

Conclusion: The application method of transdermal magnesium shows promise as a joint therapy for prolonged neck pain by improving treatment effectiveness and sleep quality. The presented scenario demonstrates the positive effects of non-invasive pain management approaches on military personnel who suffer from enduring musculoskeletal discomfort. Randomized controlled trials assessing these findings in bigger populations need to be conducted to validate the research findings.

Keywords: Transdermal magnesium, chronic neck pain, sleep quality, Indian military personnel, pain management.

Abstract-79

Role of Resilience Factors affecting Work Performance among Allied Health Professionals: A Systematic Review

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ABSTRACT

Introduction: Health services worldwide increasingly recognize the need for allied health professionals to provide the most appropriate and timely care. However, the pressures of heavy workloads, time constraints, emotional demands, and the need to collaborate with multiple professional groups and clients can lead to significant stress, affecting both physical and mental well-being. In such demanding settings, resilience—the capacity to recover quickly or adapt smoothly to challenges—plays a crucial role in sustaining performance. This study aimed to identify resilience elements that influence the work performance of allied health professionals.

A systematic review was conducted using electronic databases such as Scopus, PubMed, Google Scholar, Cochrane, and Pedro. Keywords included "allied health professionals," "resilience factors," "resilience," and "performance," combined with Boolean operators. The search, covering publications from January 2013 to December 2023, initially identified 291 articles. After applying eligibility criteria, 63 articles remained, with 14 included in the final review.

Findings revealed that primary resilience factors such as coping strategies, communication skills, mindfulness, and self-efficacy directly enhanced work performance by improving stress management, focus, and confidence. Secondary factors like positive emotions, self-management, and grit contributed to sustained productivity and perseverance, while tertiary factors including life experience, maturity, optimism, social support, and healthy habits indirectly reinforced resilience, promoting overall well-being and long-term effectiveness.

Results: The resilience factors affecting work performance of allied health professionals were found from the literature. Primary resilience factors like coping, communication, mindfulness, and self-efficacy directly enhance work performance by improving stress management, focus, and confidence. Secondary factors such as positive emotions, self-management, and grit support sustained productivity and perseverance. Tertiary factors including life experience, maturity, optimism, social support, and healthy habits indirectly strengthen resilience, promoting well-being and long-term effectiveness. Together, these factors build a foundation for consistent, high-level work performance in challenging environments.

Conclusion: The review concluded that effective coping, strong communication skills, mindfulness practice, and confidence in one's abilities are key elements in enhancing the performance of allied health professionals, enabling them to thrive in challenging and high-pressure environments.

Keywords: Mindset, Self-efficacy, Stress, Emotional well-being.

Abstract-80

Impact of Aerobic Exercises on Reducing Nonspecific Low Back Pain and Improving the Flexibility among Post-menopausal Women

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ABSTRACT

Introduction: Nonspecific Low Back Pain (NSLBP) is a prevalent issue among post-menopausal women, often leading to decreased mobility and reduced quality of life. There are many pharmacological approaches and interventions.

Aim: To investigate the effects of an eight-week aerobic exercise program on reducing nonspecific low back pain (NSLBP) and enhancing flexibility in post-menopausal women.

Materials and Methods: A randomised controlled trial was conducted over eight weeks to evaluate the effects of aerobic exercises on NSLBP and flexibility. Total Sample of 50 post-menopausal women (aged 50-65 years) divided into two groups: Aerobic exercise group (n=25): included where women Participated in a structured aerobic exercise programme and control Group (n=25): maintained their usual daily activities without specific exercise intervention inclusion criteria was all post-menopausal women aged 50–65 years diagnosed with mild to moderate nonspecific low back pain (VAS score 4-7). Post-menopausal women with recent back injuries or spinal surgery and chronic low back pain are excluded from the study. The study procedure is for eight weeks, three sessions per week (45 minutes per session). The exercises included warm-up (10 min), light stretching and mobility drills, followed by aerobic activity (30 min) which includes brisk walking (15 min) and stationary cycling (15 min). Finally, Cool-down (5 min) is Static stretching for back and hamstrings. Pain Assessment is done by Visual Analog Scale (VAS), and flexibility measurement is done by Sit-and-Reach Test performed before and after the intervention. Paired T-tests were used for within-group comparisons and Independent T-tests for between-group comparisons with significance level where p-value<0.05 considered statistically significant.

Results: Participants in the aerobic exercise group experienced a significant (p=0.04) decrease in nonspecific low back painafter the eight-week intervention, while the control group showed no notable improvementin pain levels.

Conclusion: Participants engaging in moderate-intensity aerobic activities experienced a notable decrease in pain levels and increased spinal flexibility, highlighting the effectiveness of structured aerobic workouts as a non-invasive and accessible intervention.

Keywords: Cycling, Mobility drills, Sit and reach test, Stretching.

Rehabilitation of SLAP Lesion - A Case Study

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ABSTRACT

Recurrent Superior Labrum Anterior and Posterior (SLAP) lesions are commonly observed in athletes involved in repetitive overhead activities and present notable management challenges. This case report describes the physiotherapy-based, non-surgical management of a 33-year-old male weightlifter who presented with right shoulder pain eight years after an initial SLAP lesion diagnosis. The patient underwent a structured rehabilitation program including manual therapy, strengthening, and functional exercises tailored to meet the specific demands of his sport. Over the course of treatment, the patient reported a reduction in pain during overhead activities from 8/10 to 2/10 on the Visual Analog Scale. Improvements were also observed in shoulder flexion range of motion, assessed using goniometry, and in overall shoulder strength. These gains supported a progressive return to weightlifting. The case underscores the potential benefits of a well-designed physiotherapy regimen in addressing the functional limitations and pain associated with recurrent SLAP lesions, particularly in athletic populations.

Keywords: SLAP lesion, Shoulder pain, Physiotherapy, Weightlifting, Case report, Rehabilitation.

Abstract-82

Prevalence and Associated Risk Factors Affecting the Functional Activity of College Students with Medial Tibial Stress Syndrome: A Cross-sectional Study

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ABSTRACT

Introduction: Medial Tibial Stress Syndrome (MTSS) is a common condition seen in athletes, particularly college students. It is characterised by pain along the inner edge of the shinbone, resulting from repetitive stress.

Aim: To assess the prevalence of MTSS among college students and to identify the risk factors influencing their functional activity.

Materials and Methods: A cross-sectional study involved 218 college students who met the inclusion criteria according to Yates criteria, age group 18-25 years, and pain localised anterior and posteromedial side of the shin and having local tenderness were included in the study. Raosoft software was used to calculate the sample size. Standardised questionnaires and physical assessments were utilised to collect information on demographics, levels of physical activity, past injuries, and biomechanical factors. The Numerical Pain Rating Scale (NPRS) and the Lower Extremity Functional Scale (LEFS) were used to assess pain and functional activity.

Results: The prevalence of MTSS was higher $p<0.05$ in males (53.2%) than in females (46.8%). The NPRS scores revealed varying levels of pain among the participants, with a substantial proportion reporting moderate to severe pain. College students with MTSS show a greater impact on running (40%) functional activities compared to other activities.

Conclusion: MTSS significantly impacts the functional activity of college students, with a moderate to high level of pain and functional limitations. Addressing risk factors like proper footwear, training practices, and biomechanical corrections can potentially reduce the prevalence and severity of MTSS. Regular assessments using NPRS and LEFS can help in monitoring the condition and effectiveness of interventions.

Keywords: Lower extremity, Running injury, Shin pain.

Prevalence of Selfie Elbow among University Students and Associated Risk Factors on Behaviour: A Cross-sectional Study

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ABSTRACT

Introduction: The increasing use of smartphones and digital devices has led to a rise in the prevalence of musculoskeletal disorders, with one of the emerging concerns being "Selfie Elbow." This condition, characterised by elbow pain or discomfort associated with prolonged holding of a phone at an awkward angle while taking selfies, has gained attention in recent years. University students, who are frequent smartphone users, may be particularly at risk due to the high amount of time spent on mobile devices for socialising and academic purposes.

Aim: To study the prevalence of Selfie Elbow among university students, focusing on the condition's occurrence and its associated risk factors on behaviour.

Materials and Methods: A cross-sectional survey design was employed, involving 120 university students recruited through simple random sampling. Data were collected using a structured questionnaire assessing sociodemographic characteristics, selfie-taking frequency, and musculoskeletal pain. Data were analysed using Statistical Package for the Social Sciences (SPSS) version 27, applying descriptive statistics, Pearson correlation, and linear regression to identify significant patterns and associations.

Results: The study included 120 participants (60% female, 40% male), predominantly aged 21-22 years (40%). Most students (60%) reported taking selfies daily, with 50% experiencing pain in the wrist, elbow, or shoulder. Analysis indicated a significant correlation between selfie-taking frequency and pain severity (p-value<0.05). Risk factors included prolonged smartphone use and awkward postures during selfie-taking.

Conclusion: Selfie Elbow is a prevalent issue among university students, linked to excessive smartphone use and poor ergonomic practices. Awareness campaigns and ergonomic interventions are recommended to mitigate the risk of developing musculoskeletal pain due to digital habits. This cross-sectional study aims to explore the prevalence of Selfie Elbow among university students, as well as the associated risk factors linked to their behaviour. By understanding these factors, the study seeks to contribute to preventive strategies and improve awareness regarding this condition among young adults.

Keywords: Ergonomics, Musculoskeletal disorders, Smartphone overuse, Young adults.

Abstract-84

Effect of Dynamic Taping and Thera Band Training on Pain and Overall Well-being in a 19 Year Old NCC Cadet with Chronic Heel Pain: A Case Report

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ABSTRACT

Introduction: Many physically active individuals who are also NCC cadets are often exposed to repetitive stress, improper biomechanics, and high-impact activities that can lead to chronic heel pain. Persistent discomfort not only limits mobility but also reduces performance and overall quality of life. Dynamic taping offers biomechanical support by helping the body move more efficiently, reducing strain, and alleviating discomfort. TheraBand training, on the other hand, focuses on strengthening and improving functional stability. When used together, these interventions can address both pain management and rehabilitation needs effectively. A 19-year-old NCC cadet with months-long heel pain caused by overuse and insufficient recovery underwent a combined treatment involving dynamic taping and TheraBand training. The pain had significantly limited participation in both training sessions and daily activities, with only minimal relief from rest and standard pain medication. Dynamic taping was applied to protect the affected area, minimize tissue strain, and improve sensory feedback to prevent unnecessary joint movements. TheraBand exercises targeted the strengthening of foot and lower leg muscles, addressing possible muscular imbalances contributing to the pain. The Foot Function Index was used to assess foot functionality, while the Short Form-36 questionnaire measured overall health-related quality of life. The intervention led to reduced pain and improved functional capacity, with dynamic taping providing joint stability during exercises and TheraBand training enhancing muscular strength and balance. This combined approach supported the cadet's recovery, enabling a return to physical activity with improved mobility and well-being.

Keywords: Dynamic Taping, TheraBand training, Chronic Heel Pain, Plantar Fasciitis, Pain, NCC cadet.

Association between Screen Time Related Musculoskeletal Symptom among Desk Job Employees: A Cross-Sectional Study

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ABSTRACT

Introduction: Some body areas are more commonly impacted by musculoskeletal problems due to prolonged screen time.

Aim: To investigate the association between screen time and musculoskeletal symptoms among desk job employees. It seeks to identify the prevalence, severity, and distribution of musculoskeletal discomfort related to prolonged screen exposure and sedentary work habits. Additionally, the study aims to analyse potential risk factors and ergonomic considerations that may contribute to musculoskeletal issues in this population.

Materials and Methods: This cross-sectional study was conducted desk job employees. Three components made up the questionnaire that was used; the first section included demographic detail questions, the second included the Nordic musculoskeletal questionnaire (NMQ) checklist to assess Musculoskeletal symptoms, and the third included the Musculoskeletal Health Questionnaire (MHK-QH) to evaluate the outcome, screen time to assess the open question. Statistical analyses were performed by Statistical Package for the Social Sciences (SPSS) software and find the correlation.

Results: The study found a significant correlation (r=0.83) between increased screen time and the prevalence of musculoskeletal symptoms among desk job employees. Higher screen time was associated with more frequent and severe musculoskeletal complaints.

Conclusion: The findings suggest that longer screen time is linked to a higher risk of developing musculoskeletal symptoms in desk job employees. It highlights the need for interventions to reduce screen time and promote musculoskeletal health in the workplace.

Keywords: Nordic musculoskeletal questionnaire, Health, Work place

Poster Presentation(s)		
S.No	**Name**	**Title**
1	Shafaque Aazmi	Impact of Plantar Arches on Foot Biomechanics
2	Anuj Kumar Sharma	Impact of Plantar Arches on Foot Biomechanics
3	Farheen Naaz	Role of Footwear in Acquired Flatfoot in Adults
4	Mohammad Faisal	Role of Footwear in Acquired Flatfoot in Adults
5	Chanchal Rani	Biomechanical Comparison of Different Running Shoes
6	Abhimanu Tiwari	Lower Back Pain - The Muscle Culprit
7	Bhumika Gupta	AI-Driven Motion Analysis Treated by Exoskeletal Shoes
8	Surya Pratap Singh Gaur	AI-Driven Motion Analysis Treated by Exoskeletal Shoes
9	Himanshu Kumar	AI-Driven Motion Analysis Treated by Exoskeletal Shoes
10	Prajwal Chaurasiya	Clinical Gait Evaluation of Patients with Knee Osteoarthritis
11	Ashwani Jaiswal	Lower Back Pain - The Muscle Culprit
12	Sakshi Parmar	Physical Therapy Exercises for Lower Back Pain
13	Aanchal Dwivedi	Lower Cross Syndrome
14	Alice	Biomechanics of Posture and Its Significance
15	Dhruv Chauhan	Role of Biomechanics in Posture and Movement
16	Suha Tariq	Rehabilitation in Arthritis Patients
17	Pooja Mandal	The Future of Smart Adaptive Walking in Gait
18	Kartik Kumar Singh	Footwear for Geriatrics
19	Divyanshi Sheoran	Role of Smart Insoles for Early Fall Detection in Neurological Patients