هوالحامی

پنجمین کنگره بین‌المللی و سی‌وششمین کنگره سالیانه انجمن فیزیوتراپی ایران

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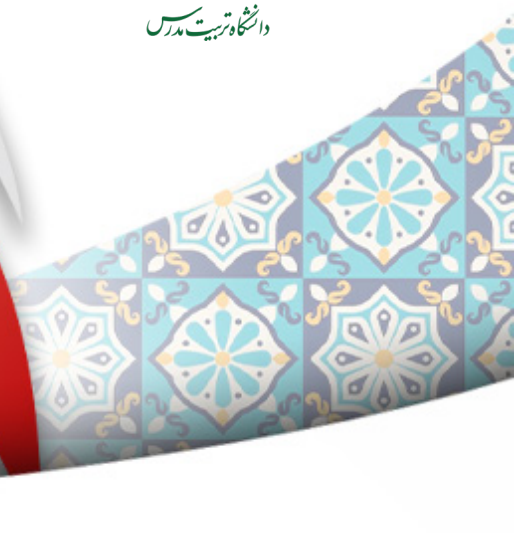

پنجمین کنگره بین‌المللی و سی‌وششمین کنگره سالیانه انجمن فیزیوتراپی ایران

به کوشش: **محمدرضا آشتیانی**

امور اجرایی و بازرگانی: **حمیدرضا اسکندری**

گرافیک: **حامد کاظمی - حامد خلیلی**

نوبت چاپ: **اول/ ۱۴۰۴**

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پیام رئیس کنگره

دکتر ایرج عبداللهی

رئیس پنجمین کنگره بین‌المللی
و سی‌وششمین کنگره سالیانه
انجمن فیزیوتراپی ایران

به نام خداوند جان و خرد
کزین برتر اندیشه برنگذرد

برگزاری پنجمین کنگره بین‌المللی و سی‌وششمین کنگره سالیانه انجمن فیزیوتراپی ایران، هم‌زمان با شصتمین سال تأسیس این انجمن پرافتخار، فرصت ارزشمندی است تا بار دیگر نقش برجسته فیزیوتراپی در ارتقای نظام سلامت کشور مورد تأکید قرار گیرد. امروز، فیزیوتراپی به عنوان یکی از ارکان اساسی نظام سلامت، با تکیه بر دانش تخصصی، شواهد علمی و رویکردهای نوین، سهم مهمی در بهبود کیفیت زندگی بیماران و کاهش بار بیماری‌ها ایفا می‌کند. انجمن فیزیوتراپی ایران در این کنگره میزبان تعداد کثیری از همکاران عزیز فیزیوتراپیست و متخصصین رشته‌های مختلف می‌باشد که در قالب سخنرانی، پوستر، پنل‌های تخصصی، کارگاه‌های عملی و همینطور نمایشگاه بزرگ تجهیزات فیزیوتراپی و توانبخشی برگزار خواهد شد. بر خود لازم می‌دانم مراتب قدردانی صمیمانه خود را از تیم پرتلاش برگزاری کنگره به ویژه دبیران علمی و اجرایی و همه عزیزانی که با تلاش پیوسته و برنامه‌ریزی دقیق، زمینه برگزاری این رویداد علمی را فراهم کرده‌اند، ابراز کنم. امید است این کنگره با تبادل دانش، طرح پژوهش‌های نوآورانه و گسترش همکاری‌های بین رشته ای، مسیر توسعه علمی فیزیوتراپی کشور را بیش از پیش هموار سازد و موجب ارتقای استانداردهای حرفه‌ای در سطح ملی و فراملی گردد.

پیام دبیر علمی کنگره

دکتر گیتی ترکمان

دبیر علمی پنجمین کنگره
بین‌المللی و سی‌وششمین کنگره
سالیانه انجمن فیزیوتراپی ایران

به نام خداوند صاحب قلم
خرد باید و دانش و راستی

همکاران گرامی و شرکت‌کنندگان ارجمند، مفتخریم که با لطف خداوند مهربان و یاری شما عزیزان، بزرگترین رویداد علمی سالانه فیزیوتراپی را برگزار نماییم. در سی و ششمین کنگره ملی و پنجمین کنگره بین المللی تلاش کرده‌ایم برنامه‌ای علمی و کاربردی فراهم کنیم که دانش، تجربه بالینی و فناوری‌های نوین را در هم آمیزد تا در راستای ارتقای فیزیوتراپی برای بهبود سلامت جامعه قدمی برداشته شود. در شرایطی که با روند رو به رشد جمعیت سالمندی مواجهیم، ضرورت تقویت و توسعه فیزیوتراپی بیش از پیش آشکار می‌شود؛ فیزیوتراپی نه تنها حرفه‌ای بالینی است بلکه نیرویی راهبردی برای حفظ استقلال عملکردی و ارتقای کیفیت زندگی است. روند سالمندی با تغییرات ساختاری و عملکردی در سیستم های عصبی-عضلانی-اسکلتی، قلبی-تنفسی و عصبی-شناختی همراه است که خطر افتادن، شکستگی استخوانی، ناتوانی و وابستگی را افزایش می‌دهد. برنامه‌های پیشگیرانه و درمان های فیزیوتراپی مبتنی بر شواهد می‌تواند روند تحلیل عضلانی-اسکلتی و کاهش عملکرد را کند نماید، سطح فعالیت روزمره را حفظ کند و از ورود زودهنگام به چرخه عدم استقلال عملکردی و مراقبت های پرهزینه جلوگیری نماید. علاوه بر این با توجه به شیوع سرطان، برنامه ریزی برای رشد توانمندی های علمی وبالینی فیزیوتراپیست ها برای ورود به چرخه چند وجهی وطولانی‌مدت درمان این بیماری، یک ضرورت است. این بیماران در مراحل تشخیص ودرمان با مشکلاتی مانند ضعف عضلانی، خستگی و درد مزمن، کاهش ظرفیت تنفسی و محدودیت‌های حرکتی روبرو می‌شوند که توانایی انجام فعالیت‌های روزمره و کیفیت زندگی آنان را تحت تأثیر قرار می‌دهد. مداخلات تخصصی فیزیوتراپی در کنترل و کاهش عوارض شایع اولیه و ثانویه مانند لنف-ادم در این بیماران بسیار اهمیت دارد. در سی و ششمین کنگره سالانه و پنجمین کنگره بین المللی فیزیوتراپی تلاش شده است که به کمک استادان، پژوهشگران و متخصصان فیزیوتراپی و سایر رشته‌های تخصصی پزشکی، رویکرد های بالینی با تاکید بر تکنولوژی های نوین درسیزده پانل تخصصی بحث و بررسی شود. در این راستا برای اولین بار دو پانل اختصاصی در ارتباط با نقش فیزیوتراپی در استئوپروز و سارکوپنیای سالمندی و سرطان با تمرکز بر لنف-ادم، برگزار خواهد شد. پیشاپیش از همکاری شایسته و بی چشمداشت اساتید و همکاران گرامی در داخل کشور و اساتید فیزیوتراپی خارج از کشور که بصورت حضوری و یا با ارسال سخنرانی ضبط شده ما در نشست های علمی یاری می رسانند، سپاسگزاری می نمایم. امیدوارم این کنگره بستری برای تبادل دانش، توسعه روش‌های مبتنی بر شواهد و تقویت همکاری های بین رشته ای باشد تا فیزیوتراپی به‌عنوان رکن محوری در حفظ عملکرد فیزیکی و استقلال فردی، موجب ارتقای سلامت جامعه باشد. از همه اساتید، پژوهشگران،فیزیوتراپیست ها، دانشجویان و حامیانی که این رویداد علمی را ممکن ساختند صمیمانه قدردانی می‌کنم و امیدوارم کنگره امسال، پربار، الهام‌بخش و منشأ همکاری‌های نوین بین رشته ای برای ارتقای سلامت جامعه باشد.

پیام دبیر اجرایی کنگره

دکتر
پرهام پارسانژاد

دبیر اجرایی پنجمین کنگره
بین‌المللی و سی‌وششمین کنگره
سالیانه انجمن فیزیوتراپی ایران

در آستانه برگزاری پنجمین کنگره بین المللی و سی و ششمین کنگره سالیانه انجمن فیزیوتراپی ایران، بزرگترین گردهمایی صاحبان اندیشه های درمانگر و دستان شفابخش، اشتیاق وصف ناپذیرم را برای دیدار یکایک شما میهمانان گرانقدر ابراز می دارم. به میمنت قدوم مبارکتان با همراهی ریاست محترم کنگره، دبیر علمی پرتوان، همکاران گرانقدرم در هیأت مدیره و دبیرخانه انجمن و کمیته های پرتلاش علمی و اجرایی، در یکی از جدیدترین مجموعه های بزرگ و تخصصی همایش کشور، برای رقم زدن سه روز پربار، خاطره انگیز و فراموش نشدنی آماده می شویم، که تنها رضایت خاطر و خوشحالی شما می تواند انگیزه دهنده و نیروبخش، برای ادامه راه سخت و پرفراز و نشیب خدمتگزاری در این عرصه باشد. در همین آغاز خدمت شما و تمامی استوره هایی که روزهای پرافتخار تأسیس، توسعه آموزش، استقلال حرفه ای و ارتقاء فیزیوتراپی به دی پی تی را در تقویم این رشته به ثبت رساندند، درود می فرستم و باور دارم "فروتنی"، "همدلی" و "تلاش" کلیدواژه های اقتدار و سربلندی ما در رسیدن به تمامی رؤیاهای دست نیافتنی می باشند. احترام متقابل و تکریم استاد، همکار و دانشجو می تواند قطره قطره های فیزیوتراپی را به دریا بدل سازد و با دور کردن اختلاف و انشقاق، سرعت پیشرفت و توسعه را شتابی مضاعف ببخشد. مقدم شما را به کنگره امسال، نمایشگاه بزرگ تجهیزات با همراهی همیشگی شرکتهای تولیدکننده و وارد کننده و جشن ۶۰ سالگی انجمن فیزیوتراپی ایران گرامی میداریم و امیدواریم این کنگره هم همچون سالهای گذشته منشاء دستاوردهای ارزشمند و نوینی برای فیزیوتراپی کشور باشد.

اعضای هیئت مدیره انجمن فیزیوتراپی ایران

فیزیوتراپیست دکتر ایرج عبداللهی	رئیس انجمن
فیزیوتراپیست دکتر احمدموذن زاده	نائب رئیس
فیزیوتراپیست دکترپرهام پارسانژاد	دبیر
فیزیوتراپیست دکتر اشکان آذرکیش	خزانه دار
فیزیوتراپیست دکتر محمدرضا پوراحمدی	عضو هیات مدیره انجمن مسئول کمیته علمی
فیزیوتراپیست همایون آبایی	عضو هیات مدیره انجمن مسئول کمیته تهران و کمیته حقوقی
فیزیوتراپیست دکتر ناهید رحمانی	عضو هیات مدیره انجمن مسئول کمیته دانشجویی
فیزیوتراپیست دکتر علیرضا شهاب	عضو هیات مدیره انجمن مسئول شاخه ورزشی
فیزیوتراپیست امین مرید مشتاق	عضو هیات مدیره انجمن مسئول کمیته بیمارستانی
فیزیوتراپیست دکتر علی الستی	بازرس

اعضای کمیته ی علمی (به ترتیب حروف الفبا)

دبیر علمی: **دکتر گیتی ترکمان**

فیزیوتراپیست دکتر اسماعیل ابراهیمی تکامجانی	دانشگاه علوم پزشکی ایران
فیزیوتراپیست دکتر جلال احدی	دانشگاه علوم پزشکی تبریز
فیزیوتراپیست دکتر عاطفه امینیان‌فر	دانشگاه علوم پزشکی سمنان
فیزیوتراپیست دکتر سحر بوذری	دانشگاه تربیت مدرس
فیزیوتراپیست دکتر محمد رضا پور احمدی	دانشگاه علوم پزشکی ایران
فیزیوتراپیست دکتر سیدمجید حسینی	دانشگاه علوم پزشکی شهید بهشتی
فیزیوتراپیست دکتر خسرو خادمی	دانشگاه علوم پزشکی شهید بهشتی
فیزیوتراپیست دکتر طاهره رضائیان	دانشگاه علوم پزشکی کرمان
فیزیوتراپیست دکتر حسین رفسنجانی	دانشگاه علوم پزشکی مشهد
فیزیوتراپیست دکتر رویا روانبد	دانشگاه تربیت مدرس
فیزیوتراپیست دکترآزاده شادمهر	دانشگاه علوم پزشکی تهران
فیزیوتراپیست دکتر مریم السادات صبا	دانشگاه علوم پزشکی تهران
فیزیوتراپیست دکتر جواد صراف زاده	دانشگاه علوم پزشکی ایران
فیزیوتراپیست دکتر آیلین طلیم خانی	دانشگاه علوم پزشکی همدان
فیزیوتراپیست دکتر مریم عباس زاده امیردهی	دانشگاه علوم پزشکی بابل
فیزیوتراپیست دکتر سهیلا عباسی	دانشگاه علوم پزشکی کرمانشاه
فیزیوتراپیست دکتر ایرج عبدالهی	دانشگاه علوم توانبخشی و سلامت اجتماعی
فیزیوتراپیست دکتر فاطمه غیاثی	دانشگاه علوم پزشکی زاهدان
فیزیوتراپیست دکتر فریبا قادری	دانشگاه علوم پزشکی تبریز
فیزیوتراپیست دکتر احسان قاسمی	دانشگاه علوم پزشکی اصفهان
فیزیوتراپیست دکتر سروناز کریمی	دانشگاه علوم پزشکی گیلان
فیزیوتراپیست دکتر زهرا کوثریان	دانشگاه علوم پزشکی اهواز
فیزیوتراپیست دکتر صدیقه کهریزی	دانشگاه تربیت مدرس
فیزیوتراپیست دکتر محمد علی محسنی بند پی	دانشگاه علوم توانبخشی و سلامت اجتماعی
فیزیوتراپیست دکتر حسین نگهبان	دانشگاه علوم پزشکی مشهد
فیزیوتراپیست دکتر فرزانه یزدانی	دانشگاه علوم پزشکی شیراز

اعضای کمیته اجرایی

دبیر اجرایی: **دکتر پرهام پارسانژاد**

مسئول هماهنگی مجموعه همایش رزمال دکتر احمد مؤذن زاده	**مسئول دبیرخانه کنگره** سرکار خانم الهه کرامتی
مسئول روابط عمومی کنگره دکتر پرهام پارسانژاد	**مسئول غرفه انجمن** سرکار خانم رها قربانی
مسئول امور مالی دکتر اشکان آذرکیش	**مسئول هماهنگی پوسترهای کنگره** فیزیوتراپیست زینب واشقانی
بازرس کنگره دکتر علی الستی	**مسئول پذیرایی میان وعده و ناهار** فیزیوتراپیست محمد مسعودی
مسئول نمایشگاه تجهیزات فیزیوتراپی فیزیوتراپیست همایون آبایی، سرکار خانم الهه کرامتی، فیزیوتراپیست مرتضی احمدی	**مسئول بخش VIP** فیزیوتراپیست علی آشیانی
مسئول کمیته دانشجویی دکتر ناهید رحمانی	**مجری کنگره** فیزیوتراپیست مرضیه کردی
مسئول جلسه مسئولین شعب و شاخه‌ها و منتخبین نظام پزشکی فیزیوتراپیست امین مرید مشتاق	**مسئول طراحی لوگو و پوستر** دکتر پویا مشکبار
مسئول برگزاری مجمع عمومی دکتر احمد مؤذن زاده، دکتر محمدرضا جاجرمی	**رابط مطبوعاتی** سرکار خانم سمیرا محمدعلی
مسئول تشریفات و ضیافت شام دکتر اشکان آذرکیش، دکتر علیرضا شهاب	**مسئول پرتال کنگره و ثبت نام** شرکت همایش برنا، مهندس مهدی قاضی عسگر، مهندس مرید گوران
مسئول هماهنگی سخنرانان سالن اصلی دکتر ساناز محبی،دکتر الهام باقری یکتا، دکتر زهره زکی	**مسئول عکس، فیلمبرداری و کلیپ کنگره** آقای مجید طرقی، گروه یکتا طرح مانی
مسئول هماهنگی کارگاه‌های کنگره دکتر مطهره عباباف بهبهانی دکتر مهدیه ساجدی فر	**ناشر کتاب کنگره** رسانه تخصصی
	خدمات آقای صمدحسین‌زاده، آقای محسن شریفی

اعضای کمیته دانشجویی

باران نجفی	ریحانه قدیری	فرهاد اسدی
سونیا الماسی	علی ابراهیمی	آیسان نعمتی
محمد امین حیرانی	محمد حسین ناطقی	نسیم کرمی
محمدامین فروهی	آرمین قلاوند	سپهر رضاییان
مهدی مقبل	مهدی خسروجردی	امیرحسین بختیاری
امیرحسین رحیمی	سارا گوزل زاده	سوران عباسی
فاطمه شکوهی مهر	امیرحسین زرینه	سپهر میرزایی
زهرا یاوری فروشانی	ملینا نوراللهی	فهیمه ماستری فراهانی

برنامه علمی روزانه

First Day, Wednesday 17 December 2025

Welcome to Congress
Holly Quran recitation and playing the National Anthem of the Islamic Republic of Iran
(8.15-8.30)

Physiotherapy in Lymphedema and Oncology		
Chairpersons: Dr. Saam Eslami, Dr. Narges Meftahi, Dr. Soulmaz Rahbar Dr. Najmeh Sedighi Mehr **Panel Moderator**: Dr. Shahpar Haghighat		
Presenter	Title	Time
Dr. Shahpar Haghighat (MD, PhD, Certified Lymphologist) Professor, Breast Cancer Research Center, Motamed Cancer Institute	Lymphedema Management Diagnosis to Treatment	8.30-8.40
Physiotherapist **Dr. Saam Eslami** PT, MA, tDPT, GCOR	Cancer Prehabilitation and Lymphedema	8.40-8.50
Physiotherapist **Dr. Narges Meftahi** Assistant Professor, Shiraz University of Medical Science	Lower Extremity/Genitalia Lymphedema	8.50-9.00
Physiotherapist **Dr. Soulmaz Rahbar** Assistant Professor, Hamadan University of Medical Science	Breast Cancer Related Lymphedema	9.00-9.10
Physiotherapist **Dr. Najmeh Sedighi Mehr** Assistant Professor, Shahid Beheshti University of Medical Science	Physiotherapy Interventions in Lymphedema: Scientific Evidence to Clinical Practice	9.10-9.20

First Day, Wednesday 17 December 2025

Physiotherapist **Sahar Zamani** PhD Candidate of Physiotherapy, Tehran University of Medical Sciences	Evaluation of the Effect of Combined Decongestive Therapy on Tissue Thickness and Stiffness Changes Using Sonoelastography in Women with Breast Cancer-Related Lymphedema	9.20-9.30
Discussion and Q & A		9.30-9.40
Official Opening Ceremony (9.40-11.00)		
Coffee Break 11.00-11.30		

Geriatric Physiotherapy: Assessment, Treatment, and Prognosis of Osteoporosis and Osteosarcopenia

Chairpersons: Dr. Ahmad Delbari, Dr. Keyvan Davatgaran Taghipour
Dr. Tayebeh Roghani, Dr. Leila Agha Ghazvini, Dr. Fatemeh Sadat Mirzadeh
Panel Moderator: Dr. Giti Torkaman

Presenter	Title	Time
Dr. Ahmad Delbari Professor of Gerontology, Iranian Research Center on Aging, University of Social Welfare and Rehabilitation Sciences	The Silver Opportunity: Expanding Physiotherapy's Role in Aging Care	11.30-11.40
Physiotherapist **Dr. Keyvan Davatgaran Taghipour** Member of the Aging Research Center, University of Social Welfare and Rehabilitation Sciences	International Clinical Guideline: 8 Steps for Screening, Diagnosis, and Management of Sarcopenia in Older Adults (ICSFSR)	11.40-11.50
Dr. Fatemeh Sadat Mirzadeh Geriatric Medicine Specialist, Assistant Professor, Tehran University of Medical Sciences	Frailty: Clinical Diagnosis and Treatment	11.50-12.00

First Day, Wednesday 17 December 2025

Physiotherapist **Dr. Tayebeh Roghani** Assistant Professor, Isfahan University of Medical Science	Age-related Hyperkyphosis and its Consequences	12.00-12.10
Dr. Leila Aghaghazvini Professor, Shariati Hospital, Musculoskeletal Imaging Research Center, Tehran University of Medical Sciences	Musculoskeletal Sonoelastography Assessment in Sarcopenia	12.10-12.20
Physiotherapist **Dr. Giti Torkaman** Professor, Tarbiat Modares University	Bone-Muscle Relation: Balance and Cognitive Impairment	12.20-12.30
Physiotherapist **Dr. Elham Bagheri Yekta** Tarbiat Modares University	Achilles Tendon and Gastrocnemius Muscle Stiffness as Predictors of Sarcopenia in Postmenopausal Women: Clinical Implications for Physiotherapy	12.30-12.40
Physiotherapist **Dr. Fatemeh Sangtarash** Assistant Professor, Zanjan University of Medical Sciences	Effects of Bone-loading Exercises and Pulsed Electromagnetic Fields on Bone Mineral Density and Metabolism, and Quality of Life in Postmenopausal Osteoporotic Women	12.40-12.50
Discussion and Q & A		12.50-13.00
Lunch		13.00-14.00

First Day, Wednesday 17 December 2025

Physiotherapy in the Knee Functional Impairments

Chairpersons: Dr. Abolfazl Bagheri Fard, Dr. Mohamad Razi, Dr. Esmaeil Ebrahimi Takamjani, Dr. Alireza Shahab, Dr. Ali Alasti
Panel Moderator: Dr. Khosro Khademi Kalantari

Presenter	Title	Time
Dr. Mohammad Razi Associate Professor Department of Orthopaedic Surgery, Rasoul Akram Hospital, Fellowship in Knee Surgery, Iran University of Medical Sciences	Effective Factors for Weight Bearing (Partial-Full Weight) after Knee Reconstructive Surgery	14.00-14.10
Dr. Abolfazl Bagherifard Professor, Bone and Joint Reconstruction Research Center Shafa Yahyaeian Orthopedics Hospital, Fellowship in Knee Surgery, Iran University of Medical Sciences	Knee Intra-articular Injections: Indications and Contraindications	14.10-14.20
Physiotherapist **Dr. Esmaeil Ebrahimi Takamjani** Professor, Iran University of Medical Sciences	Exercise Therapy in Functional Knee Disorders	14.20-14.30
Physiotherapist **Dr. Khosro Khademi Kalantari** Professor, Shahid Beheshti University of Medical Sciences	Exercise Therapy in Knee Impingement	14.30- 14.40
Physiotherapist **Dr. Alireza Shahab** Head of the Sport Branch, IPA	Return-to-Sport Parameters in Knee Injuries	14.40-14.50
Discussion and Q&A		14.50-15.00

First Day, Wednesday 17 December 2025

Lumbopelvic Instability: Clinical Updates

Chairpersons: Dr. Sedigheh Kahrizi, Dr. Amir Hossein Kahlaei, Dr. Mohammad Bagher Shamsi, Dr. Zahra Salahzadeh
Panel Moderator: Dr. Mohammad Taghipour

Presenter	Title	Time
Physiotherapist **Dr. Amir Hossein Kahlaee** Professor, University of Social Welfare and Rehabilitation Sciences	Structural and Functional Contribution in Low Back Pain Symptoms	15.00-15.10
Physiotherapist **Dr. Sedigheh Kahrizi** Associate Professor, Tarbiat Modares University	Pathophysiology of Thoracolumbar Fascia in Low Back Pain	15.10-15.20
Physiotherapist **Dr. Mohammad Taghipour** Professor, Babol University of Medical Science	The Role and Alteration of Muscles Contributing lumbopelvic Stability	15.20-15.30
Physiotherapist **Dr. Mohammad Bagher Shamsi** Professor, Kermanshah University of Medical Science	Surface Electromyography Biofeedback for Assessment of Core Muscle Function in Chronic low Back Pain	15.30-15.40
Physiotherapist **Dr. Zahra Salahzadeh** Professor, Tabriz University of Medical Science	Practice Stability Exercises without the fear of re-injury: Virtual Reality Therapy	15.40-15.50
Discussion and Q & A		15.50-16.00
Coffee Break		16.00-16.20

First Day, Wednesday 17 December 2025

Oral Presentations

Chairpersons: Dr. Mohammad Mohsen Roostaee, Dr Jalal Ahadi, Dr Farzaneh Yazdani, Dr. Meissam Sadeghisani, Physiotherapist Amin Morid Moshtagh
Moderator: Dr. Ali Asghar Norasteh

Presenter	Title	Time
Physiotherapist **Dr. Maryam Abbaszadeh Amirdehi** Assistant professor Babol University of Medical Sciences	Association Between Neurodynamic Disorders and Demographic and Clinical Characteristics in Patients with Patellofemoral Pain Syndrome	16.20-16.30
Physiotherapist **Dr. Saeedeh Monjezi** Assistant professor Ahvaz Jondishapur University of Medical Sciences	Lower Extremity Coordination during Walking with and without Optic Flow Perturbations in Athletes with Anterior Cruciate Ligament Reconstruction and Healthy Controls: A Case-Control Study	16.30-16.40
Physiotherapist **Elham Rostami Mehr** PhD Candidate, Tarbiat Modares University	The Relationship between Hip Abductor Strength and Endurance, WOMAC Scores, and Knee and Hip Kinetics and Kinematics during Stair Descent in Individuals with Knee Osteoarthritis	16.40-16.50
Physiotherapist **Fatemeh Bakhshi Feleh** Ahvaz Jondishapur, University of Medical Sciences	Differences in Cognitive Function Based on the Pain Catastrophizing Level in Individuals with Non-specific Chronic Low Back Pain	16.50-17.00
Physiotherapist **Fereshteh Rezazadeh** PhD Candidate, Ahvaz Jondishapur, University of Medical Sciences	Investigating Muscular Structural Differences Between Patients with LBP Classified into the Movement System Impairments Subgroups	17.00-17.10

First Day, Wednesday 17 December 2025

Physiotherapist **Mahdieh Sajedifar** PhD Candidate,Tarbiat Modares University	Influence of Central Sensitization and Fear-Avoidance Beliefs on Center of Pressure Displacement Velocity in Patients with Chronic Low Back Pain	17.10.17.20
Physiotherapist **Dr. Ebrahim Ramezani** Iran University of Medical Sciences	Investigation of Cervical Muscle Dimensions During Craniocervical Flexion Task in Various Functional Positions of the Upper Limbs and Lumbar Spine in Individuals with and Without Chronic Non-Specific Neck Pain	17.20-17.30

Second Day, Thursday 18 December 2025

A Comprehensive Overview of Pelvic Floor Physiotherapy		
Chairpersons: Dr. Afsaneh Nikjooy, Dr. Ilia Khajeh, Dr. Saeideh Babazadeh, Dr. Hoda Niknam **Panel Moderator**: Dr. Fariba Ghaderi		
Presenter	Title	Time
Physiotherapist **Dr. Fariba Ghaderi** Professor, Tabriz University of Medical Sciences	Physiotherapy in Bowel Dysfunctions	8.00-8.10
Physiotherapist **Dr. Saeideh Babazadeh** Assistant Professor, Arak University of Medical Science	Chronic Pelvic Pain in Women	8.10-8.20
Physiotherapist **Dr. Afsaneh Nikjooy** Assistant Professor, Iran University of Medical Sciences	The Role of Physiotherapy in Female Infertility	8.20-8.30
Physiotherapist **Dr. Hoda Niknam** Assistant Professor, Shahid Beheshti University of Medical Science	Pelvic Floor Physiotherapy Following Surgery for Colorectal Cancer and Radiotherapy	8.30-8.40
Physiotherapist **Dr. Ilia Khajeh** Pelvic Floor Branch, IPA	High-Tesla Magnets in Pelvic Floor Dysfunction: Evidence and Clinical Practice	8.40-8.50
Physiotherapist **Dr. Fatemeh Oraki** Jondishapur University of Medical Sciences	Comparing the Effects of Biofeedback and Transcutaneous Tibial Nerve Stimulation, Alone or in Combination, in Women with Coexisting Complaints of Dyssynergic Defecation and Stress Urinary Incontinence: RCT	8.50-9.00

Second Day, Thursday 18 December 2025

Physiotherapist **Ghazal Roshdi** PhD Candidate Shiraz University of Medical Sciences	Experience of Iranian Women With Multiple Sclerosis About Urinary Dysfunctions Consequences: A Qualitative Study	9.00-9.10
Physiotherapist **Zahra Etminan** Shiraz University of Medical Sciences	Clinical Outcomes of Physical Therapy in a Patient with Pudendal Nerve Entrapment Syndrome: Case Report	9.10-9.20
Discussion and Q & A		9.20-9.30

Myofascial Release Techniques

Chairpersons: Dr. Ghazi Sarhan,Dr. Farid Bahrpeyma, Dr. Afsaneh Zeinalzadeh
Panel Moderator: Dr. Azadeh Shadmehr

Presenter	Title	Time
Physiotherapist **Dr. Ghazi Sarhan** Certified Instructor of the USA Hawk Grips, Bahrain	Instrument Assisted Soft Tissue Mobilization	9.30-9.45
Physiotherapist **Dr. Azadeh Shadmehr** Professor, Tehran University of Medical Science	Myofascial Release Facts	9.45-9.55
Physiotherapist **Dr. Farid Bahrpeyma** Associate Professor, Tarbiat Modares University	Manual Soft Tissue/Fascia Release Techniques in Musculoskeletal Disorders	9.55-10.05

Second Day, Thursday 18 December 2025

Physiotherapist **Dr. Afsaneh Zeinalzadeh** Associate Professor, Mashhad University of Medical Sciences	Effects of Functional Mobilization with and without Dry Needling on Pain, Disability, Quality of Life, Balance, and Treatment Effectiveness in Patients with Patellofemoral Pain Syndrome: A Randomized Controlled Trial	10.05-10.15
Physiotherapist **Dr. Majid Shahbazi** Assistant Professor, Mashhad University of Medical Sciences	Effect of Thoracic Soft Tissue Release and Mobilization on Chronic Pain and Disability in Patients Undergoing Total Knee Arthroplasty	10.15-10.25
Physiotherapist **Dr. Tahere Rezaeian** Assistant Professor, Mashhad University of Medical Sciences	Comparison of the Effects of Dry Needling Technique versus Femoral Nerve Neural Mobilization on the Pain, Functionality, and Knee Range of Motion in Patients with Patellofemoral Pain Syndrome	10.25-10.35
Discussion and Q & A		10.35-10.40
Coffee Break		10.40-11.00

Physiotherapy in Cardiorespiratory Disorders and Intensive Care

Chairpersons: Dr. Navid Shafigh, Dr. Zahra Rezaeian, Dr.Mohammad Javaherian
Panel Moderator: Dr. Mohsen Abedi

Presenter	Title	Time
Dr. Navid Shafigh Assistant Professor, Fellowship of Intensive Care Medicine, Department of Anesthesiology, Shahid Beheshti University of Medical Sciences	Physiotherapy in ICU: The Importance, Precautions, and Contraindications	11.00-11.10

Second Day, Thursday 18 December 2025

Physiotherapist **Dr. Zahra Rezaeian** Associate Professor, Isfahan University of Medical Sciences	Errors in Incentive Spirometer Training in Cardiac Inpatients	11.10-11.20
Physiotherapist **Dr. Mohammad Javaherian** Assistant Professor, University of Social Welfare and Rehabilitation Sciences	Respiratory Exercises in COVID	11.20-11.30
Physiotherapist **Dr. Mohsen Abedi** Associate Professor, Shahid Beheshti University of Medical Sciences	Exercise Therapy Protocols for Respiratory Disease	11.30-11.40
Physiotherapist **Dr. Bahareh Mehreganfar** Shahid Beheshti University of Medical Sciences	The Impact of Threshold-loaded Inspiratory Muscle Training and Respiratory Biofeedback on Preserving Inspiratory Muscle Strength and Vital Capacity after CABG: RCT	11.40-11.50
Discussion and Q & A		11.50-12.00

Innovative Technologies in Neuromuscular Rehabilitation and Cognition

Chairpersons: Dr. Ali Irani, Dr. Mohammad Hasan Azarsa, Dr. Nastaran Ghotbi, Dr. Iman Rezaei
Moderator: Dr. Mohsen Razeghi

Presenter	Title	Time
Physiotherapist **Dr. Ali Irani** Professor, Head of Department of Physiotherapy and Sports Medicine, Nanavati Max Hospital, Mumbai, India	Brain Mapping in Physiotherapy	12.00-12.15

Second Day, Thursday 18 December 2025

Physiotherapist **Dr. Hoda Salsabili** Assistant Professor, Samuel Merritt University, USA	Patient Monitoring with AI	12.15-12.25
Physiotherapist **Dr. Mohsen Razeghi** Professor, Shiraz University of Medical Sciences	The Future of Physiotherapy in Light of Technological Approaches and Innovations	12.25-12.35
Physiotherapist **Dr. Mohammad Hasan Azarsa** Assistant Professor, University of Social Welfare and Rehabilitation Sciences	Assessment of Joint Stiffness with Robotic Devices; Challenges and Future Directions	12.35-12.45
Physiotherapist **Dr. Nastaran Ghotbi** Professor, Tehran University of Medical Sciences	Inpatient Assessment Simulator Software	12.45-12.55
Physiotherapist **Dr. Iman Rezaei** Associate Professor, Shiraz University of Medical Sciences	Virtual Reality Training in Neck Pain	12.55-13.05
Discussion and Q & A		13.05-13.10
Lunch		13.10-14.00

Second Day, Thursday 18 December 2025

Distal Radius Fractures		
Chairpersons: Dr. Farid Najd Mazhar, Dr Roshanak Moradi, Dr. Aref Saidi, Physiotherapist Parham Parsanezhad **Panel Moderator**: Dr. Mohamadreza Pourahmadi		
Presenter	Title	Time
Dr. Farid Najd Mazhar Professor, Hand Surgeon, Shafa Yahyaeian Hospital, Iran University of Medical Sciences	Open Treatment of Distal Radius Fractures	14.00-14.10
Dr. Roshanak Moradi Orthopedic Surgeon, Fellowship in Hand Surgery	Closed Treatment of Distal Radius Fractures	14.10-14.20
Physiotherapist **Dr. Mohamadreza Pourahmadi** Assistant Professor, Iran University of Medical Science	Evidence-Based Physiotherapy after Distal Radius Fractures	14.20-14.30
Physiotherapist **Parham Parsanezhad** PhD Candidate, Iran University of Medical Science	Complications of Distal Radius Fractures	14.30-14.40
Physiotherapist **Dr. Aref Saidi** Head of Corrective Exercises Branch IPA	Therapeutic Exercises Post-Operation Distal Radius Fractures	14.40-14.50
Discussion and Q & A		14.50-15.00

Second Day, Thursday 18 December 2025

Oral Presentations

Chairpersons: Dr. Ailin Talimkhani, Dr Sarvenaz Karimi, Dr Zahra Kosarian, Physiotherapist Anooshirvan Mohammadi, Physiotherapist Vahdat Mohammadi
Moderator: Dr. Rozita Hedayati

Presenter	Title	Time
Physiotherapist **Dr. Motahareh Hashem Boroojerdi** Oman College University Lecturer	Enhancing Body Awareness in Rehabilitation	15.00-15.10
Physiotherapist **Seyyed Mohammadreza Hoseini** Iran University of Medical Sciences	Comparison of Kinesio Tape, Counterforce Brace and Corticosteroid Injection in Patients with Tennis Elbow: A Prospective RCT	15.10-15.20
Physiotherapist **Dr. Masoome Ebrahimzadeh** Assistant Professor, Hormozgan University of Medical Sciences	Diffusion Tensor Imaging of Corticospinal Tract Connectivity after Dry Needling on Muscle Spasticity in Stroke Patients	15.20-15.30
Physiotherapist **Fateme Abrishami Gale** Jondishapur University of Medical Sciences	The Effect of Cognitive Task on lower limb Kinematics during Gait in Athletes with Chronic Ankle Instability Compared to Copers	15.30-15.40
Physiotherapist **Narjes Saadi** Jondishapour University of Medical Sciences	Comparing the Effects of Cognitive Task and Attentional Focus on Intra-limb Coordination during Walking in People with Multiple Sclerosis: A Case-Control Study	15.40-15.50
Physiotherapist **Dr. Ghazal Hashemi Zenooz** University of Social Welfare and Rehabilitation Sciences	The Effect of Adding Virtual Reality-Based Rehabilitation to Conventional Physiotherapy on Pain, Functional Ability and Static Balance Control in Patients with Total Knee Arthroplasty	15.50-16.00
General Assembly of the Iranian Physiotherapy Association		16.00-18.00

Third Day, Friday 19 December 2025

Therapeutic Approaches to Foot Problems

Chairpersons: Dr. Arash Maleki, Physiotherapist Homayoun Setudeh, Dr. Hassan Saeedi, Dr. Sahar Boozari
Panel Moderator: Dr. Amin Kordi Yoosefinejad

Presenter	Title	Time
Dr. Arash Maleki Associate Professor, Pediatric Orthopedic Surgeon,Shahid Beheshti University of Medical Sciences	Effective Treatments for Achilles Tendon Tightness, Flat Foot, Genu Varum and Genu Valgum	8.00- 8.10
Dr. Hassan Saeedi Professor, Orthotics and Prosthetics Department, Iran University of Medical Sciences	Proposed Theories in Leg and Foot Orthoses Prescription	8.10-8.20
Physiotherapist **Homayoun Setudeh**	Physiotherapy in Plantar Fasciitis	8.20-8.30
Physiotherapist **Dr. Sahar Boozari** Assistant Professor, Tarbiat Modares University	The Effects of Kinesio Tape and Exercise Therapy on Flat Foot	8.30-8.40
Physiotherapist **Dr. Amin Kordi Yoosefinejad** Associate Professor, Shiraz University of Medical Sciences	Exercise Therapy for Flat Foot	8.40-8.50
Physiotherapist **Dr. Seyed Mehdi Mohsenipour** Iran University of Medical Sciences	Comparative Effects of Chain vs. Local Myofascial Release on Clinical Outcomes and Plantar Fascia Thickness in Chronic Plantar Fasciitis	8.50-9.00

Third Day, Friday 19 December 2025

Physiotherapist Dr. Saman Salehi Tehran University of Medical Sciences	Ultrasonographic Changes in Plantar Fascia Thickness and Echogenicity after Conservative Interventions for Plantar Fasciitis	9.00-9.10
Discussion and Q & A		9.10-9.20

Physiotherapy in Shoulder Girdle Syndromes

Chairpersons: Dr. Morteza Nakhaei, Dr. Soheil Mansour Sohani, Physiotherapist Ashkan Azarkish
Panel Moderator: Dr. Roya Ravanbod

Presenter	Title	Time
Professor Ann Cools Head of Education for Rehabilitation Sciences and Physiotherapy, Ghent University, Belgium	Subacromial Pain: Theoretical Background, Assessment, and Treatment	9.20-9.40
Dr. Morteza Nakhaei Amroodi Associate Professor, Fellowship in Shouldr and Elbow Surgery, Bone and Joint Reconstruction Research Center, Iran University of Medical Sciences	The Importance of Physiotherapy after Supraspinatus Surgery	9.40-9.50
Physiotherapist **Dr. Soheil Mansour Sohani** Associate Professor, Iran University of Medical Science	Electrotherapy Modalities in Shoulder Impingement Syndrome	9.50-10.00

Third Day, Friday 19 December 2025

Physiotherapist **Dr. Roya Ravanbod** Associate Professor, Tarbiat Modares University	Exercise Therapy in Scapular Dyskinesia	10.00-10.10
Physiotherapist **Ashkan Azarkish** PhD Candidate Shiraz University of Medical Sciences	Physiotherapy in Rotator cuff Tendinopathy	10.10-10.20
Physiotherapist **Sayeh Moosavi Chavoshi** Tehran University of Medical Sciences	Effects of Integrating kinetic Chain Exercises into a Scapular Stabilization Program on Pain, Function, and Scapular kinematics in Overhead Athletes with Shoulder Impingement Syndrome	10.20-10.30
Discussion and Q & A		10.30-10.40
Coffee Break		10.40-11.00

Neuro-Rehabilitation

Chairpersons: Dr. Mohammadreza Hadian, Dr. Fatemeh Ehsani, Dr.Ehsan Ghasemi, Physiotherapist Omolbanin Alirezaei
Panel Moderator: Dr. Minoo Khalkhali Zavieh

Presenter	Title	Time
Physiotherapist **Dr. Abbas Tabatabaei** Research Fellow, Department of Physical Therapy and Rehabilitation Sciences, KS, USA	Chronic Lower Body Pain in People with Multiple Sclerosis and Treatment Techniques	11.00-11.10
Physiotherapist **Dr. Mohammadreza Hadian** Professor, Tehran University Of Medical Sciences	Noninvasive Stimulation of the Central Nervous System: A Conjunct Protocol for Rehabilitation	11.10-11.20

Third Day, Friday 19 December 2025

Physiotherapist **Dr. Fatemeh Ehsani** Professor, Semnan University of Medical Sciences	TDCS in Postural Stability	11.20-11.30
Physiotherapist **Dr. Minoo Khalkhali Zavieh** Professor, Shahid Beheshti University of Medical Sciences	TDCS in Neuro-Rehabilitation of Children	11.30-11.40
Physiotherapist **Omolbanin Alirezaei** Head of Pediatric Neurology Branch, IPA	Physiotherapy Approaches in Pediatric Neurology	11.40-11.50
Physiotherapist **Dr. Ehsan Ghasemi** Assistant Professor, Isfahan University of Medical Sciences	Investigating the Effect of Reactive and Proactive Exercises on Balance Performance and Balance Confidence in Patients with Multiple Sclerosis: RCT	11.50-12.00
Physiotherapist **Mahdi Esmaeeli** Tehran University of Medical Sciences	Combined Effects of Dry Needling and Static Stretching on Plantar Flexor Spasticity, Function, and Quality of Life in Chronic stroke: A Double-Blind Randomized Sham-Controlled Trial	12.00-12.10
Physiotherapist **Dr. Maryam Niajalili** Shahid Beheshti University of Medical Sciences	Cognitive Training Combined with Physiotherapy Enhances Plantar Sensation and Quality of Life in Patients with Diabetic Peripheral Neuropathy: RCT	12.10-12.20
Discussion and Q & A		12.20-12.30
Lunch		12.30-13.30

Third Day, Friday 19 December 2025

Emerging Evidence on Electrotherapy

Chairpersons: Dr. Iraj Abdollahi, Dr. Dr. Arista Shojaeddin, Dr. Mohamad Reza Asadi, Dr. Basir Majdoleslami, Dr. Hamid Zamani
Panel Moderator: Dr. Javad Sarrafzadeh

Presenter	Title	Time
Physiotherapist **Dr. Iraj Abdollahi** Professor, University of Social Welfare and Rehabilitation Sciences	Fundamentals of Clinical Decision Making in Electrotherapy	13.30-13.40
Physiotherapist **Dr. Javad Sarrafzadeh** Professor, Iran University of Medical Science	High Power Laser Therapy in Tendinopathy Management and Challenges	13.40-13.50
Dr. Arista Shojaeddin President of Iranian Medical Laser Association (IMLA)	Laser Acupuncture in Musculo-skeletal Pain	13.50-14.00
Physiotherapist **Dr. Mohamad Reza Asadi** Assistant Professor, Hamadan University of Medical Science	High Power Laser Therapy on the Myofascial Trigger Points	14.00-14.10
Physiotherapist **Dr. Basir Majdoleslami**	Quantum in Laser Field Therapy	14.10-14.20
Physiotherapist **Dr. Zohreh Zaki** Tarbiat Modares University	Effectiveness of High-Power Laser Therapy on Partial Tears of the Supraspinatus Tendon: RCT	14.20-14.30

Third Day, Friday 19 December 2025

Physiotherapist **Mohammad Sheibanifar** Shahid Beheshti University of Medical Sciences	The Effect of High-Intensity Laser Therapy on Diabetic Foot: RCT	14.30-14.40
Physiotherapist **Fatemeh Keshavarzi** Shiraz University of Medical Sciences	Shockwave Therapy Augments Exercise for Traumatic Meniscal Tears: A Pilot RCT	14.40-14.50
Discussion and Q & A		14.50-15.00
Coffee Break		15.00-15.10

Oral Presentations

Chairpersons: Dr. Soheila Abbasi, Dr. Hosein Rafsanjani, Dr. Tahereh Rezaeian, Dr. Maryam Saba, Physiotherapist Hadieh Tehrani
Moderator: Dr. Mohsen Mir

Presenter	Title	Time
Physiotherapist **Dr. Parsa Salemi** Assistant Professor, Shahid Beheshti University of Medical Sciences	The Immediate Effect of Trigger Point Dry Needling on Postural Stability and Functional Performance in Athletes with Chronic Ankle Instability	15.10-15.20
Physiotherapist **Mehrab Rezaee Moghaddam Roudbane** Iran University of Medical Sciences	Ultrasound Assessment of the Diaphragm and Abdominal Muscles among Elite Wrestlers with and without Low Back Pain- a Case-Control Study	15.20-15.30
Physiotherapist **Dr. Vahid Mazloum** University of Social Welfare and Rehabilitation Sciences	The Effects of Adding a Selective Neuromuscular Training Program to Traditional Basketball Exercises on Musculoskeletal Risk Factors in Semi-professional Basketball Players	15.30-15.40

Third Day, Friday 19 December 2025

Physiotherapist **Amin Rastgar Sangari** Shiraz University of Medical Sciences	Anodal vs Cathodal TDCS Priming Effects on Exercise Training Outcomes in Patients with Knee Osteoarthritis	15.40-15.50
Physiotherapist **Parsa Safapour** Tehran University of Medical Sciences	Effects of Caffeine and Total Motion Release on Cognitive Function in Semi-Professional Sprinters: RCT	15.50-16.00
Physiotherapist **Dr. Mehdi Ahmadi** University of Social Welfare and Rehabilitation Sciences	The Different Effects of Diaphragmatic Breathing and Aerobic Exercise on the Quality of Life in Reflux Patients: A Comparative Study	16.00-16.10
Physiotherapist **Dr. Mitra Parsa** University of Social Welfare and Rehabilitation Sciences	The effect of frontal-plane focused balance training on fall prevention in chronic stroke survivors: A randomized controlled trial	16.10-16.20
Closing Ceremony		16.20-17.00

First Day-Wednesday 17 December 2025

سالن استاد محسن هاشمی

بررسی چالش های صنفی فیزیوتراپی

اعضای پانل: فیزیوتراپیست همایون آبایی، فیزیوتراپیست علی کیانی، فیزیوتراپیست زهرا حاجیلو، فیزیوتراپیست حسن نوری، فیزیوتراپیست موسی طیبی فر، فیزیوتراپیست سعید شجری، فیزیوتراپیست بابک رجائیان،دکتر احمد رضا نعمت الهی، دکتر پوپک معتمد وزیری، دکتر هوشنگ امامی، دکتر شهرام حسینی، فیزیوتراپیست طاهره نجفی

گرداننده پانل: دکتر احمد موذن زاده

موضوع	زمان
چالش‌های صنفی فیزیوتراپی	۱۳:۳۰-۱۵:۱۰
پرسش و پاسخ	۱۵:۱۰-۱۵:۳۰

Second Day-Thursday 18 December 2025

سالن استاد محسن هاشمی

جلسه کمیته بیمارستانی انجمن فیزیوتراپی با همکاران شاغل در بیمارستان ها

گرداننده: فیزیوتراپیست امین مرید مشتاق

زمان: ۱۳:۳۰-۱۵:۳۰

Third Day-Friday 19 December 2025

سالن دکتر اسماعیل ابراهیمی

بررسی رویکردهای حقوقی در مسائل صنفی فیزیوتراپی

اعضای پانل: فیزیوتراپیست کیانوش کفشچی، فیزیوتراپیست محمد محمد نیا، فیزیوتراپیست یوسف شیخانی، فیزیوتراپیست محمد حسن معصومی، فیزیوتراپیست مهدی سرافراز، فیزیوتراپیست محمد اکرم میر صادقی، فیزیوتراپیست عباس پیری، فیزیوتراپیست مرتضی احمدی، فیزیوتراپیست حمید رضا یار احمدی، وکیل انجمن فیزیوتراپی آقای احسان فرزانه

گرداننده پانل: فیزیوتراپیست همایون آبایی

موضوع	زمان
رویکردهای حقوقی در مسائل صنفی فیزیوتراپی	۱۳:۳۰-۱۵:۱۰
پرسش و پاسخ	۱۵:۱۰-۱۵:۳۰

کارگاه‌های تخصصی- روز اول- چهارشنبه ۱۴۰۴/۰۹/۲۶

سالن	عنوان کارگاه	مدرس	برگزارکننده	زمان
۱	High-Tesla مگنت در آسیب‌های اسکلتی-عضلانی	فیزیوتراپیست **دکتر شاهین گوهرپی** دانشیار دانشگاه علوم پزشکی جندی شاپور اهواز	انجمن فیزیوتراپی ایران با همکاری شرکت سپیدجامگان	۱۴:۰۰-۱۶:۰۰
۲	فیزیوتراپی در سرطان خون و سرگیجه و عدم تعادل پس از شیمی‌درمانی	فیزیوتراپیست **دکتر سام اسلامی**	انجمن فیزیوتراپی ایران	۱۴:۰۰-۱۶:۰۰
۳	Cold Plasma Therapy & Matrix Rhythm Therapy (Quantum Resonance Therapy from Real to Myth)	فیزیوتراپیست **شقایق فولادوندی**	انجمن‌فیزیوتراپی ایران با همکاری شرکت آویژه درمان	۱۴:۰۰-۱۶:۰۰
۴	راهکارهای نوین تحریکات الکتریکی و الکتروآکوپانکچر بر مبنای نیازهای درمانی در فیزیوتراپی	فیزیوتراپیست **دکتر جواد صراف زاده** استاد دانشگاه علوم پزشکی ایران فیزیوتراپیست **دکتر سیامک بشر دوست** دانشیار دانشگاه علوم پزشکی تهران	انجمن‌فیزیوتراپی ایران با همکاری شرکت ایران سپتا	۱۴:۰۰-۱۶:۰۰
۱	Hand Therapy: Robotic-Based Exercise Training with Multi Feedback	فیزیوتراپیست **دکتر محمدحسن آذرسا** استادیار دانشگاه علوم توانبخشی و سلامت اجتماعی	انجمن فیزیوتراپی ایران با همکاری شرکت فیدار توانبخش صبا	۱۶:۰۰-۱۸:۰۰
۲	Deep Microvibration Therapy	فیزیوتراپیست **دکتر بصیر مجدالاسلام**	انجمن فیزیوتراپی ایران با همکاری شرکت نگار پژوهان طب	۱۶:۰۰-۱۸:۰۰
۳	اصول فیزیکی و بیولوژیکی لیزرتراپی و کاربرد آن در اختلالات شایع ارتوپدی و نورولوژی در حیوانات	فیزیوتراپیست **مجید رجبیان** فیزیوتراپیست **مهدی اسماعیلی**	انجمن فیزیوتراپی ایران	۱۶:۰۰-۱۸:۰۰

کارگاه‌های تخصصی- روز دوم- پنج‌شنبه ۱۴۰۴/۰۹/۲۷

سالن	عنوان کارگاه	مدرس	برگزارکننده	زمان
۱	Instrument-Assisted Soft Tissue Mobilization	**Dr. Ghazi Sarhan** Certified Instructor of the USA Hawk Grips, Bahrain	انجمن فیزیوتراپی ایران	۱۳:۰۰-۱۸:۰۰
۲	تشخیص افتراقی در آسیب های ورزشی و کاربرد درمان های ترکیبی	**دکتر علیرضا شهاب** مسوول شاخه ورزشی انجمن فیزیوتراپی	انجمن فیزیوتراپی ایران با همکاری شرکت ایران سپتا	۱۴:۰۰-۱۶:۰۰
۳	روش‌های نوین در ارزیابی پاسچر	فیزیوتراپیست **دکتر سهیل منصور سوهانی** دانشیار دانشگاه علوم پزشکی ایران	انجمن فیزیوتراپی ایران با همکاری شرکت آرمان تجهیز مدیسا	۱۴:۰۰-۱۶:۰۰
۴	تکار تراپی در اختلالات کف لگن	فیزیوتراپیست **دکتر فریبا قادری** استاد دانشگاه علوم پزشکی تبریز فیزیوتراپیست **دکتر عباس سلطانی** استادیار دانشگاه علوم پزشکی تبریز	انجمن فیزیوتراپی ایران با همکاری شرکت نوآوران آذر بهبود	۱۴:۰۰-۱۶:۰۰
۵	از انجماد تا ذوب: یک پارادایم درمانی مبتنی بر جدیدترین شواهد علمی برای شانه یخ‌زده	فیزیوتراپیست **دکتر سلمان نظری مقدم** دانشیار دانشگاه علوم پزشکی مشهد	انجمن فیزیوتراپی ایران با همکاری شرکتMDF	۱۴:۰۰-۱۶:۰۰

کارگاه‌های تخصصی - روز سوم - جمعه ۱۴۰۴/۰۹/۲۸

سالن	عنوان کارگاه	مدرس	برگزارکننده	زمان
۱	فیزیوتراپی و بازتوانی قلبی	فیزیوتراپیست **منیر ظفرنژاد** (فیزیوتراپی و بازتوانی قلبی (Phase I))	انجمن فیزیوتراپی ایران	۸:۳۰-۹:۱۰
		فیزیوتراپیست دکتر **بهاره مهرگان فر** (رویکردهای درمانی نوین در فاز I فیزیوتراپی قلبی)		۹:۱۰-۹:۳۰
		فیزیوتراپیست **دکتر سمیه آذرنیا** استادیار دانشگاه علوم پزشکی گیلان (ملاحظات بالینی بر اساس پرونده و یافته‌های تشخیصی بیماران در فاز I)		۹:۳۰-۹:۵۰
		پرسش و پاسخ		۹:۵۰-۱۰:۰۰
		فیزیوتراپیست **منیر ظفرنژاد** (فیزیوتراپی و بازتوانی قلبی (Phase II))		۱۰-۱۰:۱۵
		فیزیوتراپیست دکتر **مریم‌السادات صبا** (فیزیوتراپی و بازتوانی قلبی(Phase III))		۱۰:۱۵-۱۰:۴۰
		فیزیوتراپیست دکتر **مریم السادات صبا** استادیار دانشگاه علوم پزشکی تهران (پرونده‌نویسی بیماران قلبی در فاز سرپایی)		۱۰:۴۰-۱۰:۵۰
		فیزیوتراپیست دکتر **ارغوان حاجی باشی** (فیزیوتراپی و بازتوانی قلبی از راه دور)		۱۰:۵۰-۱۱:۰۰
۲	شاک ویو و اکوپانکچر در درمان ضایعات عضلانی اسکلتی	فیزیوتراپیست دکتر **وحید مظلوم**	انجمن فیزیوتراپی ایران با همکاری شرکت مهندسی پزشکی میکروتکنولوژی	۱۰:۳۰-۱۲:۳۰
۳	LSVT BIG در درمان بیماران نورولوژی	فیزیوتراپیست دکتر **افسانه زینل‌زاده** دانشیار فیزیوتراپی، دانشگاه علوم پزشکی مشهد	انجمن فیزیوتراپی ایران	۱۰:۰۰-۱۲:۰۰

حامیان مالی کنگره

گروه حامیان پلاتینیوم

ردیف	نام شرکت
۱	MDF
۲	ایران سپتا
۳	نوین
۴	NPT
۵	اطلس آزما پیشرفته

ضیافت شام

ردیف	نام شرکت
۱	سپید جامگان

گروه حامیان طلایی

ردیف	نام شرکت
۱	مایکروتکنولوژی
۲	مهندسی پزشکی پرتو
۳	طب و صنعت شریف
۴	آویژه درمان

ردیف	نام شرکت
۵	اکسون
۶	فیدار توانبخش صبا
۷	ناریاتک
۸	دنیز

حامیان مالی کنگره

گروه حامیان نقره‌ای

ردیف	نام شرکت
۱	بلوریک
۲	موج پرداز تصویر
۳	آوین طب
۴	طب صبا

ردیف	نام شرکت
۵	سپهران
۶	آذر بهبود
۷	نوآوران

گروه حامیان برنز

ردیف	نام شرکت
۱	ثمر
۲	ساختار شناسان
۳	تسکا صنعت
۴	رایمند
۵	نهال

ردیف	نام شرکت
۶	رایمند آستر طب پیشرو
۷	نرم افزار بقراط
۸	TDS
۹	پایامهر تجهیز

سایر حامیان

ردیف	نام شرکت
۱	آرمان پویا
۲	ایده پزشکی اشکان
۳	نوین صنعت
۴	ماندگار نام اصفهان
۵	پویا
۶	بهبود گستر
۷	دایان پژوه ایده آل

ردیف	نام شرکت
۸	ارتعاشات طبی ایرانیان
۹	توانبخشی امید
۱۰	رهاورد مهر ایرانیان
۱۱	آرمان تجهیز مدیسا
۱۲	الیاآوید راد
۱۳	فناوری اطلاعات میهن رایان

خلاصه مقالات

ABSTRACTS

- خلاصه مقالات سخنرانی
  Oral Presentations
- خلاصه مقالات پوستر
  Poster Presentations

خلاصه
مقالات
سخنرانی

Oral Presentations

Evaluation of the Effect of Combined Decongestive Therapy on Tissue Thickness and Stiffness Changes Using Sonoelastography in Women with Breast Cancer-Related Lymphedema

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Introduction: In the management of lymphedema, particularly in patients following breast cancer treatment, the primary focus of therapeutic interventions has traditionally been on reducing the volume of the affected limb. However, qualitative aspects of tissue condition, such as fibrosis, stiffness, and structural alterations of soft tissue, have been less systematically evaluated. These qualitative changes can significantly influence limb function, treatment response, and patients' quality of life. The present study aimed to investigate the effect of Combined Decongestive Therapy on tissue qualitative parameters in patients with lymphedema using sonoelastography

Materials and Methods: In this pilot study, 10 female patients with stage II lymphedema secondary to breast cancer treatment underwent ten sessions of Combined Decongestive Therapy, consisting of Manual Lymph Drainage (MLD), multilayer compression bandaging, and therapeutic exercises. Sonoelastography was employed to assess qualitative tissue changes. The outcomes included the thickness of cutaneous and subcutaneous tissues, shear wave velocity, and tissue stiffness in three regions: the dorsal hand, mid-forearm, and mid-arm. Measurements were taken before and after the intervention

Results: Data analysis showed that following the therapeutic interventions, the thickness of the subcutaneous tissue decreased in all three measured regions; however, the reduction in cutaneous tissue thickness was statistically significant only in the mid-forearm region. Moreover, both shear wave velocity and tissue stiffness values in the forearm area decreased, indicating an improvement in the mechanical and structural properties of the soft tissue after the intervention. No significant changes were observed in the dorsal hand or mid-arm regions

Conclusion: Findings from this preliminary study support the effectiveness of Combined Decongestive Therapy not only in reducing limb volume but also in improving the qualitative properties of the affected tissue in lymphedema. Sonoelastography, as a novel and noninvasive method for assessing biomechanical tissue changes, demonstrates strong potential for use in monitoring tissue responses to therapy in these patients. Considering that elastographic assessment of lymphedematous limbs is classified within the domain of musculoskeletal ultrasonography, this technique can be incorporated into the specialized practice of physiotherapists as a valuable clinical tool for assessment and treatment planning.

Keywords: Lymphedema, Cancer, Sonoelastography

Achilles Tendon and Gastrocnemius Muscle Stiffness as Predictors of Sarcopenia in Postmenopausal Women: Clinical Implications for Physiotherapy

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Introduction: Sarcopenia is a major risk factor for falls, disability, and reduced quality of life in postmenopausal women. Identifying simple and clinically relevant predictors is essential for early detection and effective rehabilitation strategies.
Materials and Methods: Fifty-two postmenopausal women were classified into healthy, osteoporotic, and osteosarcopenic groups according to EWGSOP criteria. Assessments included appendicular skeletal muscle mass index (ASMI) measured using a Hologic DXA device, maximal plantar flexor strength, medial gastrocnemius (MG) stiffness at rest and during contraction(MVC), and Achilles tendon stiffness at rest and contraction. Elastography of the Achilles tendon was performed using a Supersonic MACH30 ultrasound system. Multinomial logistic regression and Pearson correlation analyses were applied.
Results: Logistic regression revealed that ASMI, plantar flexor strength, MG stiffness (rest and MVC), and Achilles tendon stiffness at rest were significant independent predictors of sarcopenia status ($p < 0.01$). Achilles tendon stiffness during contraction was not a significant predictor. Pseudo R^2 (Nagelkerke = 1.0) indicated excellent model fit. Correlation analysis demonstrated strong positive associations between ASMI and both plantar flexor strength ($r = 0.588$, $p < 0.001$) and stiffness measures (r ranging from 0.688 to 0.713, $p < 0.001$). These findings highlight the interdependence of plantar flexor strength, ASMI, and gastrocnemius and Achilles tendon stiffness during MVC.
Conclusion: Reduced Achilles tendon and gastrocnemius stiffness during MVC may be a key indicator of sarcopenia in postmenopausal women. From a physiotherapy perspective, combining simple measure of leg muscle strength with the elastography of gastrocnemius and Achilles tendon (especially during MVC) may offer additional sensitivity for early detection and monitoring of the sarcopenia. Incorporating these parameters into physiotherapy practice may guide individualized exercise prescription and tendon-loading interventions to counteract sarcopenia and improve postural stability and functional outcomes.
Keywords: Sarcopenia, Achilles tendon stiffness, Muscle stiffness, Postmenopausal

Effects of Bone-Loading Exercises and Pulsed Electromagnetic Fields on Bone Mineral Density and Metabolism, and Quality of Life in Postmenopausal Osteoporotic Women

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Introduction: Given the bone sensitivity to mechanical stimulus, bone-loading exercises and applying the Pulsed Electromagnetic Fields (PEMF(s)) are recommended for osteoporosis patients. In this randomized controlled clinical trial with a 12-week follow-up, the effects of three intervention programs: application of pulsed electromagnetic field (PEMF), exercises and exercises+PEMF on postmenopausal women with osteoporosis were investigated. The primary outcomes of this research were bone mineral density (BMD) and bone metabolism (bone formation and resorption biomarkers), and secondary outcomes included postural angles, functional balance, muscle strength, quality of life (QOL), and fear of falling (FoF).
Materials and Methods: Patients were randomly divided into three groups: PEMF (A), exercises (B) and the combination of two interventions PEMF+exercises (C). The intervention program in group A was: PEMF (30Hz and 45G intensity), group B: progressive resistance exercises, and group C: a combination of A and B interventions. All three groups received the intervention for 12 weeks (2 sessions per week). All patients were evaluated before the intervention, immediately after the intervention and after a 12-week follow-up (in three times). BMD was the only outcome which was evaluated before the intervention and after the 12-week follow-up (in two times).
Results: Significant improvement in primary outcomes BMD and NTX (bone resorption biomarkers) was showed in all three intervention groups at the times of evaluation ($p < 0.05$). The C group had greater significant changes to these two outcomes than the other two groups. But regarding the bone formation biomarker BSALP, no significant increase in any of the intervention groups was observed ($p > 0.05$). All secondary variables improved in the B and C groups, and there was no significant difference between these groups after the end of intervention. However, the C group was more effective than B at maintaining changes after follow-up. In contrast, A group only had an significant effect on the functional balance after the end of intervention and improved FOF and QOL after follow -up ($P < 0.05$).
Conclusion: Based on the results, the combination of PEMF+exercises is the most effective program for improving BMD and reducing bone resorption. However, in the improvement of secondary variables, immediately after the end of the intervention, the combination of these two programs did not show a significant difference compare to applying exercise alone. However, applying exercises + PEMF was more effective in maintaining the changes

after follow up. Meanwhile, our study showed that the use of PEMF alone is effective in improving BMD and functional balance, and reducing bone resorption biomarker immediately after the intervention and improving the FoF and QoL after follow-up.
Keywords: Pulsed-Electromagnetic-field, Exercises, Bone-Mineral-Density, Bone-Metabolism

Association Between Neurodynamic Disorders and Demographic and Clinical Characteristics in Patients with Patellofemoral Pain Syndrome

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Introduction: Patellofemoral pain syndrome (PFPS) is among the most prevalent causes of knee pain in young adults. Emerging evidence suggests that musculoskeletal pain syndromes, including PFPS, may be associated with neurodynamic disorders. The aim of this study was to examine the association between these disorders and various clinical and demographic variables, including age, sex, body mass index, pain intensity, history of low back pain, functional ability, and rectus femoris shortness.
Materials and Methods: In this cross-sectional study, 100 patients with unilateral PFPS aged 18-44 years participated. The femoral slump test (FST) and the prone knee bending (PKB) test were employed to assess neurodynamic disorders of the femoral nerve. The associations between the results of neurodynamic tests and selected clinical and demographic variables were evaluated using logistic regression analysis.
Results: Prone knee bending (PKB) test results demonstrated significant associations with functional ability (OR=0.96; 95% CI=0.93-0.99), rectus femoris shortness (OR=2.9; 95% CI=1.15-7.33), and pain intensity (OR=2.04; 95% CI=1.36-3.07). In contrast, no significant associations were identified between femoral slump test (FST) results and the demographic or clinical variables of PFPS patients.
Conclusion: Considering the significant associations observed, focusing on and addressing the clinical variables linked to neurodynamic impairments—such as functional ability, rectus femoris shortness, and pain intensity—may contribute to reducing the likelihood and severity of neurodynamic dysfunction in patients with PFPS. Therefore, targeted interventions aimed at improving these factors should be prioritized in the management of these patients.
Keywords: Patellofemoral Pain Syndrome, Neurodynamic Femoral Nerve Slump Test, Prone Knee Bending

Lower Extremity Coordination during Walking with and without Optic Flow Perturbations in Athletes with Anterior Cruciate Ligament Reconstruction and Healthy Controls: A Case-Control Study

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Introduction: One of the new approaches for gait assessment is the use of optic flow perturbation that can simulate actual challenges of training and competition for athletes and provide detailed information on gait control in athletes with anterior cruciate ligament reconstruction (ACLR) who over-rely on visual information. This study aimed to compare the effect of optic flow perturbation on lower extremity coordination during walking in athletes with ACLR and healthy controls.
Materials and Methods: 18 male athletes with ACLR and 18 healthy controls matched based on age, body mass index, and activity level participated. Treadmill walking in front of a virtual corridor was assessed in two conditions- with and without optic flow perturbation- along with motion capture by the Vicon system. The perturbation was in the form of virtual corridor movement in the medial-lateral direction. The coordination of the lower limb during walking was evaluated by calculating the Mean Absolute Relative Phase (MARP), Deviation Phase (DP), Root Mean Square Error (RMSE), and cross-correlation coefficient.
Results: two-way repeated measures ANOVA showed significant interaction for the MARP of the shank-thigh (p-value=0.027) and foot-shank (p-value=0.002) segments during the stance phase and for the DP of the shank-thigh segments during the stance (p-value=0.041) and foot-shank segments during the swing (p-value=0.024) phases of the gait cycle. Also, the main effects of group and optic flow were significant for the DP of the foot-shank segments during the stance phase and shank-thigh segments during the swing phase. Mann-Whitney U test showed no significant differences in the RMSE and the cross-correlation coefficient in the entire gait cycle between the two groups (p-value<0.05).
Conclusion: results show differences in the coordination between the lower limb segments in the face of the optic flow perturbation during gait in athletes with ACLR compared to healthy athletes. These results can indicate the persistence of sensory-motor disorders related to movement control, including over-reliance on visual information to control gait in athletes with ACLR, even after completing the rehabilitation period and returning to sports.
Keywords: Perturbation, Gait, ACL

The Relationship between Hip Abductor Strength and Endurance, WOMAC Scores, and Knee and Hip Kinetics and Kinematics during Stair Descent in Individuals with Knee Osteoarthritis

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Introduction: This study aimed to investigate the relationship between hip abductor strength and endurance, WOMAC scores, and knee and hip kinetics and kinematics during stair descent in individuals with medial knee osteoarthritis (OA).
Materials and Methods: Twenty-five adults aged 45-70 years with medial compartment knee OA (Kellgren-Lawrence grades 2-3, according to ACR criteria) participated in this cross-sectional study. Hip abductor strength and endurance were measured using a hand-held dynamometer. A 3D motion capture system recorded lower limb kinematics, frontal plane joint moments, and contralateral pelvic tilt during two stair descent strategies: step-by-step (SBSD) and step-over-step (SOSD).
Results: In the SBSD condition, hip abductor endurance was negatively correlated with knee adduction moment impulse (P = 0.030). In the SOSD condition, hip abductor strength was positively correlated with hip adduction moment impulse (P = 0.035), and endurance was positively associated with knee flexion moment impulse (P = 0.030). Lateral pelvic tilt was positively correlated with peak hip adduction and flexion angles (P = 0.002 and P = 0.000, respectively), negatively correlated with knee adduction moment impulse (P = 0.017), and positively associated with peak knee flexion moment and angle (P = 0.030 and P = 0.000, respectively). Significant negative correlations were observed between WOMAC pain score and hip abductor strength of the affected limb (P = 0.025), as well as with the average hip abductor strength of both limbs (P = 0.019).
Conclusion: Hip abductor strength and endurance are strongly associated with frontal plane mechanics, pelvic stability, and lower limb alignment during stair descent. WOMAC pain demonstrated significant negative correlations with hip abductor strength, suggesting that interventions targeting hip abductor function may improve stair negotiation and potentially slow knee OA progression.
Keywords: Knee OA, Hip abductor strength, Endurance, WOMAC

Differences in Cognitive Function based on the Pain Catastrophizing Level in Individuals with Non-Specific Chronic Low Back Pain

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Introduction: Researchers suggested that the interruptive effects of chronic pain on cognitive functions may be modulated by the level of pain catastrophizing (PC). However, in individuals with chronic low back pain (CLBP), domains of cognitive function that may be affected by the level of PC remain largely unclear. Therefore, this study aimed to compare cognitive functions between individuals with CLBP with high and low PC and pain-free controls.

Materials and Methods: This cross-sectional study examined cognitive functions of 42 individuals with CLBP and 21 pain-free controls. The PC scale was used to stratify participants with CLBP into high and low PC. PCS is a 13-item self-reported questionnaire that measures the degree of catastrophic thoughts about pain. Participants performed 5 cognitive tests from the Cambridge Neuropsychological Test Automated Battery (CANTAB), namely 5-choice reaction time, rapid visual processing, spatial working memory, attention switching task, and stop signal task.

Results: The statistical analyses revealed that compared with individuals with CLBP with low PC and pain-free controls, individuals with high PC demonstrated greater values of the between errors (P=0.01), reaction latency (P<0.001), and stop signal reaction time variables (P=0.004, 0.003, respectively) but lower values of probability of hit (P=0.02, 0.01, respectively), A' (P=0.01, <0.001, respectively), and percent correct trials variables (P=0.002, <0.001, respectively).

Conclusion: The results of the current study showed deficits in sustained attention, working memory, cognitive flexibility, and inhibitory control in individuals with CLBP with high PC. From a clinical perspective, therapeutic interventions targeting PC should be considered to decrease catastrophic thinking about pain in individuals with CLBP. Additional research is warranted to explore cognitive functioning as an outcome of these interventions in individuals with CLBP.

Keywords: Chronic Low Back Pain, Cognition, Pain Catastrophizing

Investigating muscular structural differences between patients with LBP classified into the movement system impairments subgroups.

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Introduction: Background: Based on the kinesiopathologic model, the Movement System Impairment (MSI) classification of LBP has shown that repetitive movements could contribute to pathoanatomic tissue changes. However, these changes have not been evaluated in different MSI classification subgroups of patients with LBP.

Objective: This study compared the grades of fatty infiltration as one of the muscle's pathologic changes in the lower lumbar paraspinal and psoas muscles between the two subgroups of patients diagnosed with MSI syndromes having opposite movement direction impairments.

Design: Observational cross-sectional study.

Materials and Methods: Method: Forty-five participants with chronic LBP were enrolled in the study, with 23 patients in the lumbar flexion-rotation (FlexRot) subgroup and 22 in the lumbar extension-rotation (ExtRot) subgroup of MSI. Magnetic resonance imaging (MRI) and the Goutallier Classification System (GCS) were used for fatty grading of lumbar paraspinal and psoas muscles. After the reliability of this grading scale was evaluated, the results were compared between the two subgroups.

Results: The Mann-Whitney U Test showed significantly higher fat infiltration of lower lumbar multifidus and erector spinae muscles in the lumbar ExtRot subgroup, with no significant difference between the two subgroups in terms of psoas muscles ($P \leq 0.05$). Inter-rater reliability of GCS was acceptable to excellent, and intra-rater reliability was good to excellent.

Conclusion: The fatty infiltration grade of lumbar paraspinal muscles in L4-L5 and L5-S1 levels are significantly different between the two LBP subgroups of MSI that have two opposite movement direction impairments. The lumbar paraspinal muscles, which contribute to extension, have a higher grade of fat in the ExtRot subgroup, whose symptoms are aggravated by lumbar extension.

Keywords: LBP, MSI, Muscular fat, MRI

Influence of Central Sensitization and Fear-Avoidance Beliefs on Center of Pressure Displacement Velocity in Patients with Chronic Low Back Pain

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Introduction: Central sensitization (CS), characterized by increased sensitivity of central nervous system neurons to both painful and non-painful stimuli, has been associated with altered sensory and motor processing in chronic low back pain (CLBP). Fear-avoidance beliefs (FAB), the excessive fear of movement or physical activity, may also affect postural strategies. However, the relative impact of CS and FAB on static balance control remains unclear. This study therefore aimed to investigate the influence of CS levels and FAB on center of pressure (COP) displacement velocity during static balance tasks under varying sensory conditions in individuals with CLBP.
Materials and Methods: In this cross-sectional study, 98 participants (42 men, 54 women) with CLBP were categorized into four groups based on CS severity (subclinical, mild, moderate, severe) and further divided according to the presence or absence of FAB. Body sway velocity was measured with a force plate under four visual-surface conditions (eyes open/closed on firm or foam) in AP and ML directions for 30 s. Repeated measures ANOVA was conducted to analyze main and interaction effects with a significance level set at $p < 0.05$.
Results: CS levels were not significantly associated with COP displacement velocity in either AP or ML directions across test conditions. FAB also showed no main effect. However, a significant three-way interaction between FAB, eye condition, and surface type was observed in the AP direction ($p = 0.022$), suggesting that FAB influences postural control mainly under challenging sensory conditions (e.g., eyes closed on foam).
Conclusion: CS did not significantly affect static sway velocity, whereas FAB showed stronger interactions with sensory conditions, suggesting a greater role in static postural control. These findings indicate that FAB may play a more significant role than CS in the postural balance of CLBP patients.
Keywords: Central Sensitization, Fear-Avoidance, Postural Control.

Investigation of Cervical Muscle Dimensions During Craniocervical Flexion Task in Various Functional Positions of the Upper Limbs and Lumbar Spine in Individuals with and Without Chronic Non-Specific Neck Pain

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Introduction: This study aimed to investigate changes in the anterior-posterior thickness, lateral thickness, and cross-sectional area (CSA) of cervical flexor muscles during rest and functional contraction, including craniocervical flexion (CCF), in individuals with chronic non-specific neck pain (CNSNP) compared to an asymptomatic control group.

Materials and Methods: In this cross-sectional study, 25 individuals with CNSNP and 25 healthy individuals with similar characteristics were evaluated. The thickness and CSA of cervical flexor muscles, including the sternocleidomastoid (SCM), longus colli, and longus capitis, were assessed using ultrasonography in rest (supine and seated) and contractile states (CCF at 50% and 100% of maximum voluntary isometric contraction [MVIC] alone, and CCF at 50% MVIC combined with abdominal hollowing, bilateral scapular protraction, bilateral shoulder abduction and external rotation, and bilateral D2F upper limb pattern in a seated position on a designed chair). In addition to raw data, muscle dimensions were normalized to body mass index and reported.

Results: The results of a two-way repeated-measures ANOVA revealed a significant main effect of condition on all variables of thickness and CSA of cervical muscles in both raw and normalized states ($p<0.05$), with higher mean values in contractile conditions compared to rest. Furthermore, between-group differences indicated that the dimensions of superficial and deep cervical flexor muscles were significantly smaller in the CNSNP group compared to the healthy group ($p<0.05$). However, the interaction of group by condition showed no significant effect on the thickness or CSA of superficial and deep cervical flexor muscles ($p>0.05$).

Conclusion: The seated position and the combination of CCF with upper limb movements significantly increased the dimensions of cervical flexor muscles, but variations in CCF intensity had no notable impact. The reduction in muscle dimensions in individuals with CNSNP appears to be a persistent structural or functional issue, unaffected by specific functional conditions (e.g., contraction). This underscores the need for targeted therapeutic interventions focused on activating and strengthening deep cervical flexor muscles while enhancing the coordinated function of superficial flexors to improve cervical stability and function.

Keywords: Chronic Neck Pain, Muscle Dimensions, Craniocervical Flexion, Ultrasonography

Comparing the effects of Biofeedback and Transcutaneous Tibial Nerve Stimulation, Alone or in Combination, in Women with Coexisting Complaints of Dyssynergic Defecation and Stress Urinary Incontinence: A Randomized Controlled Trial

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Introduction: To compare the efficacy of electromyography biofeedback therapy (EMG-BFT), transcutaneous tibial nerve stimulation (TTNS), and combination of EMG-BFT with TTNS in women with stress urinary incontinence (SUI) and dyssynergic defecation (DD) disorders.

Materials and Methods: In this single-blinded, three-arm, randomized controlled trial, eighty-seven women (18-60 years) with concurrent SUI and DD disorders randomly allocated into three groups (29 per group) including TTNS, EMG-BFT and combined treatment group. Participants in each group received fifteen treatment sessions (3 days per week with at least 48-hour break between sessions). Then, Patient Assessment Constipation Quality Of Life (PAC-QOL), Incontinence Impact Questionnaire, Short Form (IIQ-7) and EMG activity level of the pelvic floor muscle (PFM) during maximal voluntary contraction (MVC), straining, and coughing were assessed as treatment outcomes measured at baseline and immediately after sessions 5,10 and 15.

Results: A two-way repeated-measure analysis of variance showed that group interaction by time was significant for all measured variables. Further analysis by the Tukey post hoc test showed significant difference of PAC-QOL, IIQ-7 and EMG activity level values in the EMG-BFT group compared with TTNS group ($p < 0.001$) and in combined treatment group compared with TTNS group ($p < 0.001$) in sessions 10 and 15.

Conclusion: EMG-BFT and combined treatment significantly improved defecatory and urinary-related symptoms and PFM performance in women with SUI and DD disorders.

Keywords: Dyssynergic Defecation, Constipation, Stress Urinary Incontinence, Biofeedback, TTNS

Experience of Iranian Women With Multiple Sclerosis About Urinary Dysfunctions Consequences: A Qualitative Study

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Introduction: Multiple Sclerosis (MS) is an inflammatory neurological disease of unknown cause, damaging the myelin sheath. Bladder dysfunction, affecting 75% of MS patients, is a common symptom. Spinal plaques cause urinary issues like increased frequency, imposing costs for pads, equipment, and hospital services. In women with MS (WwMS), these issues harm physical, psychological, and social well-being. Incontinence increases fall risks, while enuresis reduces sleep quality, causing fatigue and depression. Stigma discourages discussion, with only one-third seeking treatment, often leading to harmful strategies like reduced fluid intake. The WHO (2016) advocates patient-centered care, considering cultural context. Qualitative research provides deep insights into patient experiences. This study explores Iranian WwMS's experiences with urinary dysfunction consequences.
Materials and Methods: This qualitative study with the content analysis approach included 10 women with MS (age range: 29 to 59 years), who were recruited using a purposive sampling method with maximum variation. Through semi-structured in-depth interviews, the participants explained their experiences of urinary dysfunctions consequences. The obtained data were analyzed based on the content analysis method of Graneheim and Lundman.
Results: The content analysis revealed three key themes: Physical consequences, psycho-emotional consequences, and economic consequences.
Conclusion: Urinary dysfunctions cause widespread physical, psychological, and economic problems for women with MS. Therefore, treatment staff should address the MS patient's concerns caused by urinary dysfunctions, in a non-threatening atmosphere, and help them to fearlessly manage their urinary problems.
Keywords: Qualitative content analysis, Multiple Sclerosis, Urinary dysfunctions, Lived experiences

Clinical Outcomes of Physical Therapy in a Patient with Pudendal Nerve Entrapment Syndrome: Case Report

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Introduction: Pudendal nerve entrapment (PNE), caused by compression, stretching, or injury of the nerve or its branches, commonly presents with neuropathic pain that is often worsened by prolonged sitting. This report describes a patient who was diagnosed with PNE and achieved significant improvement through a targeted physical therapy program.
Case Presentation: A 40-year-old male pharmacist presented with a 4-year history of erectile dysfunction, penile numbness, intermittent penile discoloration, urgency urinary incontinence (UUI), and chronic pelvic pain, all of which had progressively worsened. He reported fluctuating erectile difficulties and discomfort in certain sexual positions. He underwent multiple medical evaluations and treatments without sustained relief. Electromyography (EMG) of the sacral nerves revealed irritation at S1. Laboratory investigations demonstrated abnormally low levels of luteinizing hormone (LH) and follicle-stimulating hormone (FSH) (both 0.1 mIU/mL). On referral in 2023, internal anal exam revealed a tender bundle at the obturator internus and a trigger point at the gluteus maximus insertion. Based on symptoms, exams, and literature criteria, he was diagnosed with PNE. The treatment protocol consisted of: ¬ Internal fascial and trigger point release: Performed with a pelvic wand for 10 minutes per session. ¬ Dry needling: Applied to the obturator internus muscle using an 80 × 30 mm needle with the patient in the lithotomy position. ¬ Stretching exercises: Targeting the obturator internus muscle, performed three times daily, 10 repetitions per session, each stretch maintained for 30 seconds. The patient provided informed consent for the proposed treatment Outcome measurements To quantify treatment outcomes, the International Index of Erectile Function (IIEF) and the Visual Analog Scale (VAS) for pain were assessed at baseline and after three treatment sessions. Initial scores were VAS = 10 and IIEF = 44.
Results: During the following three sessions, the patient reported substantial improvement. His VAS score decreased from 10 to 2, and his IIEF score increased from 44 to 57. Repeat blood tests showed LH at 1.99 mIU/mL and FSH at 2.70 mIU/mL, values closer to the normal reference range.
Conclusion: This case report suggests that physical therapy, incorporating internal manual releasing techniques, trigger point release, and stretching exercises, can be an effective intervention for alleviating symptoms and improving sexual and urinary function in patients with PNE.
Keywords: Pudendal Nerve Entrapment, Sexual Dysfunction

Effects of Functional Mobilization with and without Dry Needling on Pain, Disability, Quality of Life, Balance, and Treatment Effectiveness in Patients with Patellofemoral Pain Syndrome: A Randomized Controlled TrialMajid

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Introduction: Patellofemoral pain syndrome (PFPS) is a prevalent knee disorder causing anterior knee pain, functional limitations, and reduced quality of life. This study compared functional mobilization (FM) alone versus FM combined with dry needling (DN), alongside conventional physiotherapy on pain, disability, quality of life, balance, and treatment effectiveness in PFPS patients.

Materials and Methods: In a double-blind randomized controlled trial, 56 patients with PFPS (aged 18-40 years) were randomized to FM (n=28) or FM+DN (n=28). Both groups received 12 sessions of conventional physiotherapy (strengthening, stretching, neuromuscular electrical stimulation) over 4 weeks, with FM+DN receiving additional quadriceps DN. Outcomes included pain (Visual Analog Scale, VAS), function (Kujala questionnaire), quality of life and function (Knee Injury and Osteoarthritis Outcome Score, KOOS), balance (Star Excursion Balance Test, SEBT), and treatment effectiveness (Global Rating of Change, GRC), assessed at baseline, post-treatment (4 weeks), and 3-month follow-up. Data were analyzed using Repeated Measures ANOVA, Independent t-tests, or Mann-Whitney U tests.

Results: Both groups showed significant within-group improvements in all outcomes ($p<0.001$). FM+DN outperformed FM in KOOS quality of life (3-month: 53.31 ± 12.47 vs. 56.96 ± 15.14, $p=0.02$), SEBT (3-month: 1.06 ± 0.13 vs. 1.13 ± 0.16, $p=0.01$), and GRC (post-treatment: 4.00 [4-5] vs. 3.50 [3-4], $p=0.009$; 3-month: 4.00 [4-5] vs. 4.00 [3-4], $p=0.006$). The FM group had a higher KOOS sports/recreation score at 3-month follow-up (65.00 ± 21.25 vs. 59.64 ± 15.51, $p=0.001$). No differences were found in VAS pain, Kujala, or other KOOS subscales ($p>0.05$).

Conclusion: Both FM and FM+DN significantly improve PFPS outcomes, with FM+DN superior for quality of life, balance, and perceived effectiveness due to trigger point release via DN. FM may excel in sports/recreation function for some patients. Integrating DN with FM offers a cost-effective, rapid approach for PFPS management. Keywords: Patellofemoral Pain Syndrome, Dry Needling, Functional Mobilization, Balance, Quality of Life

Keywords: PFPS, Functional Mobilization, Dry Needling

Effect of Thoracic Soft Tissue Release and Mobilization on Chronic Pain and Disability in Patients Undergoing Total Knee Arthroplasty

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Introduction: With the growing elderly population, the number of total knee arthroplasty (TKA) surgeries has increased. Despite the overall success of TKA, a significant proportion of patients experience chronic pain, disability, anxiety, and dissatisfaction, which may be associated with autonomic nervous system (ANS) dysfunction. This study aimed to evaluate the effects of thoracic soft tissue mobilization and manipulation on pain, disability, satisfaction, anxiety, and ANS function in patients following TKA.
Materials and Methods: In this single-blind randomized clinical trial, 30 patients with chronic pain after TKA were randomly assigned to intervention or control groups. The control group received 10 sessions of routine physiotherapy, while the intervention group received the same plus thoracic soft tissue release and mobilization. Outcomes were measured using VAS, WOMAC, OKS, BAI, blood pressure, and heart rate.
Results: Significant improvements were observed in the intervention group in pain, systolic blood pressure, and heart rate compared to the control group. While disability, satisfaction, anxiety, and diastolic pressure showed no significant differences, but effect sizes were higher in the intervention group.
Conclusion: Thoracic mobilization techniques may reduce pain, enhance ANS function, and partially improve disability and satisfaction in post-TKA patients. These findings support the potential role of thoracic interventions in managing chronic post-TKA symptoms.
Keywords: Knee Arthroplasty, Thoracic Mobilization

Comparison of the Effects of Dry Needling Technique versus Femoral Nerve Neural Mobilization on the Pain, Functionality, and Knee Range of Motion in Patients with Patellofemoral Pain Syndrome

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Introduction: One of the most common knee problems is patellofemoral pain syndrome (PFPS). It is important to pay attention to the muscles of the lumbar, hip, and knee area in patients with PFPS and femoral nerve entrapment under these shortened muscles. Hence, using therapeutic interventions to eliminate trigger points and release the femoral nerve beneath these muscles are required. Therefore, the present study aimed to compare the efficacy of dry needling (DN) versus femoral neural mobilization in patients with PFPS.

Materials and Methods: One hundred and twenty young non-athlete subjects aged between 18 and 40 years old with diagnosis of PFPS were randomly divided into 4 groups of femoral nerve neural mobilization (n = 30), dry needling (n=30), combined dry needling and femoral nerve neural mobilization (n= 30), and control (n = 30) through the simple and convenience sampling method. The experimental groups received interventions three times a week up to 6 sessions. Pain intensity, functionality, and knee flexion range of motion (ROM) of patients with PFPS were measured by the numerical pain rating scale (NPRS), the Kujala questionnaire and step-down performance, and clinical goniometer, respectively. Variables were collected in three stages of before, immediately after and one month after performing the treatment sessions.

Results: After the intervention, the combined group showed the greatest reduction in pain intensity compared to all other groups ($p < 0.001$). DN and neural mobilization groups showed similar improvements ($p > 0.999$). Also, the DN and neural mobilization groups demonstrated significant and clinically meaningful improvements in functionality scores ($p \leq 0.05$). The both treatment groups had similar results ($p > 0.999$), but the combined group demonstrated the most substantial improvement. Finally, both DN and neural mobilization groups also showed large effects in knee flexion ROM ($p < 0.001$). The combined group showed the greatest improvement ($p < 0.001$).

Conclusion: The combined intervention was the most effective in improving outcomes compared to DN and femoral neural mobilization alone. Also, DN and neural mobilization groups showed similar improvements in the pain intensity, functionality scores, knee flexion ROM after intervention and at the end of one month.

Keywords: Patellofemoral, Dry Needling, Femoral Nerve

The Impact of Threshold-Loaded Inspiratory Muscle Training and Respiratory Biofeedback on Preserving Inspiratory Muscle Strength and Vital Capacity after CABG: a Randomized Clinical Trial

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Introduction: Postoperative pulmonary complications (POPC) are common after cardiac surgeries such as coronary artery bypass grafting (CABG) and are influenced by factors including anesthesia and surgical trauma. Inspiratory muscle training (IMT) with visual biofeedback may mitigate these complications. This study investigates the impact of threshold loading inspiratory muscle training (TL-IMT) combined with respiratory biofeedback on the dynamic strength of inspiratory muscles (S-index) in patients undergoing CABG surgery during their hospitalization phase.

Materials and Methods: A single-blind study was conducted with 38 CABG candidates at Shahid Modares Hospital, Tehran. Participants were randomized into two groups: the TL-IMT with biofeedback group and the placebo IMT group. TL-IMT exercises were performed at 30% of maximum dynamic inspiratory strength using the Power Breath K5 device, with visual biofeedback displayed on the screen. The placebo group performed the same exercises at minimal load without biofeedback. Both groups received standard respiratory physiotherapy. Measurements of S-index, peak inspiratory flow (PIF), and vital capacity (VC) were taken before surgery (T1), one day after surgery (T2), and at discharge (T3).

Results: Both groups showed significant changes, with a decrease from T1 to T2 and an increase from T2 to T3. In the study group, T3 values remained the same as at T1, while the placebo IMT group experienced a significant decrease. After surgery, both groups had a drop in the S-index. However, the study group saw more pronounced changes between T3-T2 and T3-T1 compared to the control group, although no significant difference was found between T2-T1. By the time of discharge, the TL-IMT group had higher S-index values than the placebo group, returning to preoperative levels. Additionally, the TL-IMT group showed improvements in PIF and VC

Conclusion: TL-IMT with visual biofeedback effectively maintains dynamic inspiratory muscle strength and improves key pulmonary parameters in cardiac surgery patients. These findings suggest that integrating TL-IMT with biofeedback can enhance postoperative recovery and reduce the incidence of POPC

Keywords: TL-IMT, Respiratory Biofeedback, Cardiac Surgery

Comparison of Kinesio Tape, Counterforce Brace, and Corticosteroid Injection in Patients with Tennis Elbow: A Prospective, Randomized, Controlled Study

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Introduction: The aim of the study was to compare the effects of corticosteroid injection, Kinesio tape, and counterforce brace on pain intensity, Common Extensor Tendon thickness, grip strength, and functional status in the treatment of lateral epicondylitis.

Materials and Methods: A total number of 51 patients were randomized into three groups. Group 1 was given Kinesio tape, group 2 received a corticosteroid injection, and group 3 received a counterforce brace. Pain was measured using a visual analog scale, common extensor tendon thickness was measured with ultrasonography, functional status was measured using the disabilities of arm, shoulder, and hand questionnaire and grip strength was measured using a dynamometer. All evaluations were performed before treatment and at the second and fourth weeks after the treatment.

Results: No significant differences between the groups were observed for the visual analog scale scores, common extensor tendon thicknesses, grip strength, and disabilities of arm, shoulder, and hand questionnaire score compared to the baseline ($P > 0.05$). A statistically significant difference was found between the pretreatment and post treatment evaluations of pain intensity and common extensor tendon thickness in all groups at the second and fourth weeks after treatment. According to the disabilities of arm, shoulder, and hand questionnaire scale, the condition improved significantly in the brace group and corticosteroid group, whereas it had not improved in the Kinesio taping group compared to before treatment. None of the treatment methods increased the patients' grip strength ($P > 0.05$).

Conclusion: The corticosteroid injection, Kinesio tape, and especially counterforce brace effectively reduced pain and tendon thickness. However, none of these treatment methods were superior to the others.

Keywords: Injection, Tape, Braces

Diffusion Tensor Imaging of Corticospinal Tract Connectivity after Dry Needling on Muscle Spasticity in Stroke Patients

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Introduction: Spasticity is a frequent complication in patients with stroke, often linked to damage in the corticospinal tract (CST). Dry needling (DN) has positive impacts on post-stroke spasticity and improvement in the motor function.

Objective: This study aims to evaluate the effects of DN on CST connectivity and spasticity levels in adults post- stroke.

Materials and Methods: Sixteen individuals with chronic stroke were randomly assigned to a DN group or a control group. The DN group received three sessions of DN, while the control group underwent three sessions of sham needling targeting the spastic wrist flexors. Primary outcomes were CST connectivity assessed via Diffusion Tensor Imaging (DTI) and spasticity levels of wrist flexors measured by the Modified Modified Ashworth Scale (MMAS. Secondary outcomes included hand dexterity [Box and Block Test (BBT)] and wrist active and passive extension range of motion. All outcomes were evaluated pre- and post- intervention.

Results: The DN group experienced a significant reduction in spasticity (MMAS, P=0.007) and a significant increase in passive wrist extension (PROM, $p < 0.001$) compared to the control group, Although the DN group demonstrated improvements in fractional anisotropy (FA) of the affected CST ($P = 0.03$), hand dexterity (BBT, $P = 0.03$), and active wrist extension (AROM, $p < 0.001$), these differences were not statistically significant when compared between groups.

Conclusion: Three sessions of DN applied to spastic wrist flexor muscles significantly reduced spasticity and improved passive wrist extension in individuals with chronic stroke.

Keywords: Stroke, Dry-Needling, Spasticity, Corticospinal -Tract

The effect of Cognitive Task on lower limb Kinematics during Gait in Athletes with Chronic Ankle Instability Compared to copers

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Introduction: Individuals with chronic ankle instability have shown differences in gait kinematics such as increased ankle inversion compared to healthy individuals and copers, which can lead to recurrent ankle sprains. In addition to biomechanical factors, cognitive demands may also increase the risk of injury in individuals with chronic ankle instability during motor tasks. Therefore, the aim of this study was to investigate the effect of a cognitive task on gait kinematics in individuals with chronic ankle instability compared to copers.

Materials and Methods: participants in this study included 26 athletes with chronic ankle instability (14 men and 12 women) and 22 copers (11 men and 11 women) who walked barefoot at a self-selected speed on a treadmill. Assessment of kinematics was performed under single-task and dual-task conditions. The cognitive task used in this study was a visual Stroop task (color and word). Kinematic variables, including the average joint angles of the lower limb (hip, knee, ankle), were measured using a motion analysis system.

Results: Statistical analyses in the frontal plane showed that the average ankle inversion in the CAI group was significantly higher than in copers ($p = 0.043$). Additionally, in the chronic ankle instability group, visual Stroop task resulted in a significant increase in ankle inversion compared to the single task situation ($p = 0.002$). In the sagittal plane, results showed that participants reduced their mean hip and knee flexion angles and increased ankle plantarflexion in response to the visual Stroop task ($p = 0.007$, $p = 0.003$, and $p = 0.027$, respectively). Furthermore, the CAI group exhibited a decrease in knee flexion angle and an increase in average plantarflexion angle under the visual Stroop task compared to the single task ($p = 0.000$ and $p = 0.000$). Lastly, in relation to transverse plane kinematics results showed that participants increased their mean external rotation angles of the hip and ankle in response to the cognitive task ($p = 0.005$ and $p = 0.042$).

Conclusion: The results of the present study indicate that individuals with chronic ankle instability exhibited greater inversion and plantarflexion at the ankle and less flexion at the knee while performing a cognitive task during gait. Thus, cognitive load may increase the risk of recurrent ankle sprains in individuals with chronic ankle instability by placing the joint in a loose-packed position and closer to an injury mechanism. Additionally, cognitive load may increase the risk of injury throughout the entire lower limb kinetic chain by altering joint kinematics during gait.

Keywords: Ankle, Instability, Gait, Kinematics, Cognition

Comparing the Effects of Cognitive Task and Attentional Focuses on Intra-limb Coordination during Walking in People with Multiple Sclerosis: A Case-Control Study

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Introduction: Gait disturbance is one of the most common and debilitating consequences of multiple sclerosis. It is important to adopt appropriate strategies in physiotherapy interventions to improve automatic and unconscious control of gait. Accordingly, the present study aimed to investigate and compare the effects of cognitive tasks and attentional focus on intra-limb coordination during walking in people with multiple sclerosis and compare it with healthy control subjects.
Materials and Methods: Twenty-four individuals with multiple sclerosis (14 women and 10 men) and 24 healthy individuals (14 women and 10 men) matched for age and body mass index participated in this study. Lower limb intersegmental coordination during treadmill walking was examined in four conditions: no intervention, internal attention focus, external attention focus, and cognitive task using the Vicon motion analysis system. The coordination pattern was compared using the absolute mean of relative phase and the variability of coordination using the phase deviation in different conditions and between groups
Results: Two-way repeated measures analysis of variance showed a significant interaction effect for the absolute mean of relative phase in the calf-thigh segments (p-value = 0.035) and the deviation phase in the foot-calf segments (p-value = 0.015) during the swing phase of gait. Also, for the absolute mean of relative phase in the stance phase, the main effect of group in the leg-thigh segments (p-value < 0.001) and foot-calf segments (p-value < 0.001) and the main effect of gait posture in the foot-calf segments (p-value = 0.021) were significant. In addition, the main effect of group for the mean deflection phase in the calf-thigh and foot-calf segments in the stance phase and the calf-thigh in the swing phase (p-value < 0.001) and the main effect of posture for the calf-thigh (p-value = 0.002) and foot-calf (p-value < 0.001) segments in the stance phase and the calf-thigh in the swing phase (p-value < 0.001) were significant.
Conclusion: The results of the present study indicated impaired lower limb intersegmental coordination during walking in individuals with multiple sclerosis. In addition, the use

of an external attention focus strategy resulted in different changes in walking coordination in healthy individuals compared to the patient group. While performing the cognitive task along with walking resulted in improved gait coordination and stability in both groups. Further clinical studies are needed in the future to confirm these findings.

Keywords: Cognitive-Task, Attentional-Focus, Gait, Intra-Limb-Coordination, Multiple-Sclerosis

The Effect of Adding Virtual Reality-Based Rehabilitation to Conventional Physiotherapy on Pain, Functional Ability and Static Balance Control in Patients with Total Knee Arthroplasty

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Introduction: Physiotherapy in patients with total knee arthroplasty (TKA) is necessary to reduce pain, return to daily activities, and maintain balance. Today, virtual reality (VR) is being used to provide real-time visual feedbacks during the exercise. Hence, the aim of the present study was to evaluate the effect of adding virtual reality-based therapy in comparison to conventional physiotherapy on the pain, functional ability, and static balance in the acute phase after TKA.

Materials and Methods: Fifty-two patients who underwent TKA (11male, 41 female, mean age 61.92 ± 6.91 years) were randomly assigned into two groups: a control group (n = 24) and an intervention group (n = 28). The control group received conventional physiotherapy, whereas the intervention group participated in a combination of VR-based therapy and conventional physiotherapy. The primary outcome was functional ability, assessed using the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC). Secondary outcomes included pain, measured using the Numeric Rating Scale (NRS), and static balance, assessed with the Wii Balance Board. Static balance control was evaluated using center of pressure (COP) parameters, including COP area and mean velocity, under two conditions: open eyes and closed eyes. Pain and functional ability were evaluated at baseline, post-treatment, and at the one-month follow-up. Static balance measurements were taken at baseline and post-treatment.

Results: The intervention group demonstrated significant improvements compared to the control group. The WOMAC scores and pain levels showed greater reductions at both the post-treatment and follow-up phases (effect size [ES] = 36%, $P < 0.001$). The static balance

parameters improved in both groups; however, the intervention group exhibited significantly greater reductions in COP ellipse area in the standing position ($P < 0.001$) and mean velocity in the mediolateral direction ($P < 0.001$, ES = 23%). Additionally, anteroposterior mean velocity with open eyes decreased significantly only in the intervention group ($P < 0.001$). No significant changes were observed in static balance parameters under the eyes-closed condition.

Conclusion: This study demonstrated that VR-based exercise therapy significantly improved knee function, static balance, and pain management in TKA patients during early rehabilitation. The intervention group exhibited superior improvements compared to the control group, highlighting the effectiveness of integrating VR-based therapy with conventional physiotherapy. These findings suggest that this combined approach can optimize recovery and improve rehabilitation outcomes in the early phase following TKA.

Keywords: VR, TKA, Posture, Pain

Comparative Effects of Chain vs. Local Myofascial Release on Clinical Outcomes and Plantar Fascia Thickness in Chronic Plantar Fasciitis

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Introduction: Myofascial tissues are interconnected, forming a continuous web known as the myofascial chains. This study investigated whether incorporating myofascial release along the superficial backline provides additional benefits compared with a localized gastrocnemius release in improving clinical symptoms and plantar fascia thickness among individuals with chronic plantar fasciitis.

Materials and Methods: This single-blind, add-on randomized clinical trial was conducted on 30 participants with chronic plantar fasciitis. Subjects were randomly assigned to one of two groups: the Gastrocnemius Myofascial Release (G-MFR) group or the Chain Myofascial Release (C-MFR) group. Each participant received four sessions of MFR over a two-week period. Outcome measures included the Numeric Pain Rating Scale (NPRS), the Foot Function Index (FFI), and ultrasound-based assessment of plantar fascia thickness. Because the change scores were not normally distributed, between-group comparisons were analyzed using the Mann-Whitney U test with the Hodges-Lehmann estimator, and effect sizes were reported as r values.

Results: Both groups demonstrated significant post-intervention improvements in NPRS and FFI scores ($P < 0.001$). The C-MFR group showed greater reductions in both pain and functional limitation (for NPRS: $P = 0.004$, $r = 0.686$; for FFI: $P = 0.004$, $r = 0.518$). Although plantar fascia thickness significantly decreased in the C-MFR group ($P = 0.001$, $r = 0.829$), no significant change was observed in the G-MFR group ($P = 0.422$, $r = 0.206$). The be-

tween-group difference in thickness reduction was not statistically significant (P = 0.233, r = 0.222).
Conclusion: Myofascial release applied along the superficial backline appears to be more effective than isolated gastrocnemius release in improving pain and foot function in individuals with chronic plantar fasciitis. Further studies with larger samples and longer follow-up periods are recommended to clarify the long-term effects of these interventions on plantar fascia thickness.
Keywords: Plantar fasciitis, Myofascial Release, Ultrasonography

Ultrasonographic Changes in Plantar Fascia Thickness and Echogenicity after Conservative Interventions for Plantar Fasciitis

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Introduction: Plantar fasciitis (PF) is associated with increased plantar fascia thickness and reduced echogenicity. Sonography offers a reliable, non-invasive tool to assess these structural changes and monitor treatment outcomes. However, evidence on the effects of conservative interventions, particularly stretching and dry needling, on sonographic features of PF remains limited. So, this study aimed to compare the effects of stretching exercise alone versus stretching combined with dry needling on plantar fascia thickness and echogenicity in individuals with PF.
Material and Methods: In this single-blinded randomized controlled trial, 37 participants (40 feet) with PF were allocated to a stretching-only group or a stretching plus dry needling group. Ultrasound imaging was performed at baseline and after six weeks using a 7-10 MHz linear transducer. Plantar fascia thickness was measured at the insertion, 1 cm, and 3 cm from the insertion, and echogenicity was quantified in two regions of interest (ROI1: insertion-1 cm; ROI2: 1-2 cm) using ImageJ software.
Results: After six weeks, the experimental group (stretching plus dry needling) demonstrated a significant reduction in plantar fascia thickness at the insertion compared with the control group ($p < 0.001$). No significant differences were observed at 1 cm and 3 cm. Echogenicity significantly increased in both ROI1 and ROI2 in the experimental group compared with the control ($p < 0.05$). Effect sizes indicated large efficacy for thickness reduction at the insertion and moderate-to-high efficacy for echogenicity improvement.
Conclusion: Dry needling combined with stretching exercises leads to significant ultrasonographic improvements in plantar fascia morphology, reflected by decreased thickness and increased echogenicity, supporting its role as an effective conservative intervention for plantar fasciitis
Keywords: Plantar Fasciitis, Imaging, Dry Needling

Effects of Integrating Kinetic Chain Exercises into a Scapular Stabilization Program on Pain, Function, and Scapular Kinematics in Overhead Athletes with Shoulder Impingement Syndrome

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Introduction: Shoulder impingement syndrome is highly prevalent among overhead athletes due to repetitive stress. While scapular stabilization exercises are a rehabilitation cornerstone, the benefits of incorporating kinetic chain exercises remain unclear. This study compared scapular exercises alone versus combined with kinetic chain exercises on scapular position, pain, and function in these athletes

Materials and Methods: This double-blind, randomized controlled trial assigned twenty-four overhead athletes with SIS to a scapular stabilization group (n=12) or a combined scapular stabilization and kinetic chain exercise group (n=12). Both groups completed a 4-week intervention. Outcomes included pain (VAS), disability (DASH), scapular kinematics (anterior tilt, upward rotation), dynamic stability (CKCUEST, UQYBT), and scapular asymmetry (LSST). Data were analyzed using independent t-tests and Mann-Whitney U tests for between-group comparisons, and paired t-tests and Wilcoxon signed-rank tests for within-group pre-post comparison.

Results: Both groups significantly reduced pain and disability ($p<0.05$) with no between-group differences. Scapular upward rotation improved at 45° and 90° of abduction only in the stabilization group ($p<0.05$), with a significant between-group difference at 45° ($p= 0.028$). Anterior tilt at 90° improved in the stabilization group ($p= 0.016$). Both groups showed large improvements in dynamic stability tests ($p< 0.01$) with no group differences. No changes were observed in LSST

Conclusion: Both scapular stabilization and combined exercise programs effectively reduced pain and disability in overhead athletes with impingement syndrome, with no extra significant benefit from adding kinetic chain exercises for these main outcomes. The key clinical point is that scapular stabilization exercises should be the core part of rehabilitation because they are better at directly improving scapular upward rotation and reducing anterior tilt. However, the positive trends in dynamic stability seen in the kinetic chain group support a phased rehabilitation approach: clinicians should start with scapular stabilization to reduce pain and improve core movement control, then later add kinetic chain exercises to improve whole-body coordination and dynamic stability for athletes returning to high-level sports. This method takes advantage of the strengths of each type of exercise effectively.

Keywords: Scapular-Stabilization, Kinetic-Chain, Shoulder-Impingement, Overhead-Athletes

Investigating the effect of reactive and proactive exercises on balance performance and balance confidence in patients with multiple sclerosis: a randomized clinical trial

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Introduction: Multiple sclerosis is a chronic neurodegenerative disease in the central nervous system. One of the most common symptoms in these patients is balance disorder, which increases the risk of falling. The aim of this study is comparing the effect of various balance therapy exercises on balance performance in people with multiple sclerosis.
Materials and Methods: In this study, 45 patients were selected and randomly distributed evenly among three groups. One of experimental group received reactive and conventional balance exercises, the other experimental group received proactive and conventional balance exercises, and the control group received only conventional balance exercises for 3 sessions per week and a total of 12 sessions. For each patient, the Mini-BESTest and ABC Scale were used to measure the level of balance and balance confidence respectively, and to measure the frequency of falls, the questionnaire was used before the beginning of the treatment, after the treatment, and after one month of follow-up. The data were analyzed through SPSS27 software.
Results: Within-group analysis showed that balance and balance confidence increased significantly in all groups ($P<0.05$). Inter-group comparisons also showed that the reactive and proactive groups had a significant improvement in balance and balance confidence compared to the control group ($P<0.05$). Also, the frequency of falling in the reactive and proactive groups significantly decreased compared to the control group ($P<0.05$).
Conclusion: The use of reactive and proactive exercises for 12 sessions improves balance and balance confidence and reduces the frequency of falls in people with multiple sclerosis.
Keywords: Multiple Sclerosis, Balance,Exercise Therapy

Combined Effects of Dry Needling and Static Stretching on Plantar Flexor Spasticity, Function, and Quality of Life in Chronic Stroke: A Double-Blind Randomized Sham-Controlled Trial

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Introduction: Chronic stroke patients commonly experience spasticity, balance impairments, and gait difficulties. Static stretching (SS) and dry needling (DN) independently can reduce spasticity by lowering alpha motor neuron excitability. Exploring the combined effects of these interventions is crucial to determine if they yield better outcomes for managing spasticity and improving daily activities.

Materials and Methods: To evaluate the effectiveness of combining SS and DN in reducing plantar flexor spasticity compared to SS alone. This double-blind, randomized sham-controlled trial included 26 chronic stroke patients with plantar flexor spasticity, randomly assigned to either an intervention group (n=13) or a control group (n=13). The intervention group received DN (60 seconds, 3 times/week for 5 days) combined with SS (20 minutes, 5 times/week for 5 days), while the control group received sham DN and the same SS protocol. Outcome measures included the Modified Modified Ashworth Scale (MMAS), active and passive range of motion (ROM), H-reflex latency, Hmax/Mmax ratio, Timed Up and Go (TUG) test, and the Euro Quality of Life (QoL) Questionnaire. Assessments were conducted at baseline, post-intervention, and after one-week follow-up.

Exposure: DN plus SS or sham DN plus SS

Results: The study included 26 participants (21 men) with a mean age of 57.5 ± 8.9 years, mean weight of 80.1 ± 8.9 kg, mean height of 172.0 ± 7.0 cm, and a mean time since stroke of 36.4 ± 46.0 months. The intervention group showed significantly greater improvements in spasticity, and Euro QoL scores than the control group ($p<0.05$). Within-group comparisons showed that the intervention resulted in improvements in all variables for both groups ($p<0.05$). These improvements were maintained one week post-intervention, except for H-reflex latency. Additionally, reductions in spasticity correlated with increased ROM, and greater ROM was associated with shorter TUG times.

Conclusion: The combination of DN and SS is more effective in reducing spasticity and improving balance and QoL in chronic stroke patients compared to SS alone.

Trial registration: Iranian Registry of Clinical Trials (IRCT): IRCT20230719058844N1 (https://irct.behdasht.gov.ir/trial/71395)

Keywords: Stroke, Spasticity, Stretching, Dry Needling

Cognitive Training Combined with Physiotherapy Enhances Plantar Sensation and Quality of Life in Patients with Diabetic Peripheral Neuropathy: A Randomized Controlled Trial[۳]

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Introduction: Diabetic peripheral neuropathy (DPN) affects more than 50% of patients with long-standing diabetes and is a leading cause of impaired plantar sensation, balance dysfunction, foot ulcers, falls, and reduced quality of life (QOL). Standard physiotherapy and balance training offer partial improvements, yet many patients remain functionally limited. Recent evidence suggests that cognitive training may enhance sensory-motor integration and cortical plasticity, providing an innovative adjunct to conventional rehabilitation. However, robust clinical data on its impact on plantar tactile sensation and QOL in DPN are still scarce.
Objective: To evaluate the effectiveness of cognitive training combined with routine physiotherapy versus physiotherapy alone on plantar tactile sensation and QOL in patients with DPN.
Materials and Methods: In this randomized controlled trial, 28 patients with clinically confirmed DPN were allocated to either an intervention group (cognitive training + Conventional physiotherapy) or a control group (Conventional physiotherapy only). Plantar sensation was assessed using the 10 g Semmes-Weinstein monofilament, and QOL was measured with the validated SF-36 questionnaire at baseline, post-intervention (4 weeks), and 6-week follow-up. Data were analyzed using SPSS version 25. Normality was checked with the Kolmogorov-Smirnov test. Group and time effects were examined using repeated-measures ANOVA, and Statistical significance was set at $\alpha < 0.05$
Results: A significant main effect of time was observed for both plantar sensation and QOL ($P < 0.001$), indicating improvements across participants. A significant main effect of group ($P < 0.01$) demonstrated superior outcomes in the intervention group compared with controls. Moreover, a significant time × group interaction ($P < 0.01$) confirmed that improvements were greater and more sustained in the cognitive training group.
Conclusion: Cognitive training, when combined with routine physiotherapy, significantly improves plantar tactile sensation and QOL in patients with DPN. These findings underscore the translational potential of cognitive-based rehabilitation as a cost-effective, scalable, and evidence-based adjunct to standard diabetic care.
Keywords: Cognitive Training, Plantar Sensation Quality

Effectiveness of High-Power Laser Therapy on Partial Tears of the Supraspinatus Tendon: A Randomized Controlled Trial

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Introduction: High-power laser therapy (HPLT) has potential in treating shoulder disorders. However, the impact of HPLT on supraspinatus partial thickness tear (SS-PTT) remains unexplored.
Objective: To evaluate the effects of HPLT on pain, function, and musculoskeletal ultrasound (MSK-US) parameters in SS-PTT.
Materials and Methods: A randomized, assessor-blinded, placebo-controlled clinical trial was conducted. Forty-six patients with SS-PTT were randomized into the HPLT+ exercise (Exs) group or the sham+ Exs group. Twenty-three age-matched healthy subjects were evaluated for MSK-US parameters as the control group. Ten treatment sessions were administered three times per week. The HPLT was used with a maximum power of 20 watts (W), 2478 joules (J), and 24.78 J/cm2 for the first three sessions, followed by 4678 J and 46.78 J/cm2 for the subsequent seven sessions. Both intervention groups performed the Low Row, scapular squeeze with arm, and scapular retraction exercises four times daily, with 10 repetitions per session. Every third session, the repetition count was increased by 5 to promote progressive loading. Musculoskeletal parameters include (tendon thickness in short and long axis, AHD, tendon echogenicity, occupation ratio, tear size in short and long axis, and tear area echogenicity), visual analog scale (VAS), and shoulder pain and disability index (SPADI) were measured before and 48 hours after the final treatment session.
Results: At baseline, short-axis (SAX) thickness (P=0.000, η^2p=0.403, power=1/00), long-axis (LAX) thickness (P=0.035, η^2p= 0.097, power=0.638), echogenicity (P=0.000, η^2p=0.231, power=0.980), and occupation ratio (OR) (P=0.042, η^2p=0.092, power=0.610) were different between patient groups with control. All measured parameters significantly improved in the HPLT. After treatment, sham + Exs still showed significant differences in SAX thickness (P=0.001, η^2p=0.202, power=0.950), echogenicity (P=0.019, η^2p=0.112, power=0.717) and OR (P=0.003, η^2p=0.160, power=0.885) with control. Tear area in both SAX view (P=0.044, η^2p = 0.089, power=0.529) and LAX view (P=0.001, η^2p= 0.222, power= 0.934) in HPLT +Exs significantly decreased. Also, echogenicity of the tear area significantly increased in the HPLT +Exs group (P=0.000, η^2p =0.279, power= 0.981).
Conclusion: High-power laser therapy was an effective modality for patients with SS-PTT. Its ability to decrease pain and improve MSK-US parameters, especially tear size, enhances its value as part of conservative treatments.
Keywords: Supraspinatus, Ultrasonography, High Power Laser

The Effect of High-Intensity Laser Therapy on Diabetic Foot: A Clinical Trial on 24 Patients

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Introduction: Diabetic foot is one of the most serious complications of type 1 and type 2 diabetes, with a reported prevalence of about 15-25% in chronic patients. If left untreated effectively, diabetic foot ulcers (DFU) can lead to infection, osteomyelitis, and ultimately, amputation. Common treatments include debridement, advanced dressings, infection control, offloading, and physiotherapy interventions. In recent years, the use of High-Intensity Laser Therapy (HILT) has garnered attention as a supplementary method. The proposed mechanisms of HILT include stimulating microcirculation, improving tissue oxygenation, reducing inflammation, and stimulating fibroblasts to accelerate the healing process. The aim of this study was to investigate the effect of HILT on the healing process of diabetic foot ulcers, pain reduction, and functional improvement in patients referred to the Imam Hossein Hospital Physiotherapy Clinic over an 8-week period.

Materials and Methods: This study was designed as an 8-week quasi-experimental clinical trial (pre-post design) to investigate the effect of High-Intensity Laser Therapy (HILT) as an adjunct to standard care for Diabetic Foot Ulcers (DFUs). 24 patients with active DFUs, classified as Wagner Grade I-II, were recruited. Inclusion criteria included age 40-70 years and HbA1c < 9%. Exclusion criteria involved severe infection (osteomyelitis), severe peripheral arterial disease (ABI < 0.7), and prior use of energy-based therapies within the last 3 months. The HILT intervention was administered 3 times per week for 8 weeks (24 sessions). The device utilized a 1064 nm wavelength, 10 Watts of power, and a 2500 Hz frequency, delivered in a non-contact, scanning motion for 10 minutes per session. All patients concurrently received Standard Wound Care (SWC), including debridement and strict off-loading measures. Outcome measures were collected at Baseline (Week 0) and Post-Intervention (Week 8) by a blinded assessor: Primary Outcomes: Wound Size (measured by digital planimetry using ImageJ) and Wound Healing Progression (assessed by the Bates-Jensen Wound Assessment Tool: BWAT). Secondary Outcomes: Pain Intensity (Visual Analog Scale: VAS), Diabetic Quality of Life (DQOL), and Functional Status (Diabetic Foot Index: DFI). Data analysis was performed using Paired-Samples t-test to compare pre- and post-intervention mean scores, with the statistical significance level set at $p < 0.05$.

Results: Wound Size: The mean wound area decreased from 2.1 \pm 0.6 \text{ cm}^2 at the start of the study to 0.8 \pm 0.4 \text{ cm}^2 at the end of 8 weeks ($p<0.001$). VAS: Pain intensity decreased from a mean of 6.2 \pm 1.1 to 2.4 \pm 0.9 ($p<0.001$). DQOL: The patients' quality of life score significantly improved (mean change: +15 points; $p=0.002$). DFI: The Diabetic Foot Index showed a 25% improvement ($p=0.01$). BWAT: The mean wound improvement score decreased from 23 to 13, which is indicative of advanced healing ($p<0.001$).

Conclusion: The study results confirm that High-Intensity Laser Therapy (HILT), as an adjunct to standard care, leads to a significant improvement in all primary and secondary outcomes, specifically wound size reduction, decreased pain, and enhanced quality of life and functional status in Diabetic Foot Ulcer (DFU) patients. The efficacy is likely due to proposed mechanisms such as accelerated ATP synthesis, improved microcirculation, and anti-inflammatory effects. This outcome is consistent with other literature. Conclusion: HILT is an effective and safe therapeutic option that should be recommended in diabetic foot treatment protocols. Key limitations included the small sample size and quasi-experimental design, suggesting a strong need for future Randomized Controlled Trials (RCTs) with larger cohorts and extended follow-up periods.
Keywords: Diabetic Foot Ulcer High-Intensity Laser

Shockwave Therapy Augments Exercise for Traumatic Meniscal Tears: A Pilot RCT

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Introduction: Traumatic meniscal tears are common knee injuries in young adults, causing pain, functional impairment, and reduced balance. Exercise therapy is a cornerstone of conservative management, but the added benefit of extracorporeal shockwave therapy (SWT) remains unclear. This pilot study evaluated whether combining SWT with structured exercise training yields greater improvements in pain, function, balance, and quality of life (QoL) than exercise alone. Primary outcomes were pain reduction (Numerical Pain Rating Scale, NPRS) and functional improvement (Knee Injury and Osteoarthritis Outcome Score, KOOS); secondary outcomes included balance (modified Star Excursion Balance Test, mSEBT) and QoL (Western Ontario Meniscal Evaluation Tool, WOMET)
Materials and Methods: In this single-blind pilot randomized controlled trial (IRCT20131225015932N19), 42 adults with MRI-confirmed traumatic medial meniscal tears (mean age 34.0 ± 8.2 years) were randomized to SWT plus exercise (SWT+EX, n=21) or exercise alone (EX Only, n=21). Both groups completed a 6-week supervised exercise program (three sessions/week). The SWT+EX group received four weekly radial SWT sessions (4,000 impulses, 0.24 mJ/mm², 8 Hz) targeting the medial joint line via palpation of the medial femoral condyle and tibial plateau. Outcomes were assessed at baseline, 6 weeks (post-intervention), and 4-week follow-up (week 10). Minimal clinically important differences (MCIDs) were considered (e.g., NPRS ≥2 points, KOOS ≥10 points).
Results: Both groups improved significantly ($p<0.001$). SWT+EX reduced NPRS by 1.2 points more than EX Only (95% CI: -1.5 to -0.3; $\eta^2=0.21$). KOOS Pain improved by 11.8

points more (95% CI: 8.2 to 15.4; η^2=0.29). WOMET improved by 15.7 points more (95% CI: 10.1 to 20.3; η^2=0.26). Significant improvements in overall dynamic balance (mSEBT total score; η^2=0.15, 95% CI: 2.5 to 7.8) were also observed

Conclusion: Adding SWT to exercise led to clinically meaningful short-term improvements in pain, function, QoL, and overall dynamic balance (mSEBT total score) in patients with traumatic meniscal tears, with benefits persisting at 4-week follow-up (week 10). Larger trials with longer follow-up are needed to confirm these findings.

Keywords: Meniscus injuries, Extracorporeal Shockwave Therapy

The Immediate Effect of Trigger Point Dry Needling on Postural Stability and Functional Performance in Athletes with Chronic Ankle Instability

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Introduction: Ankle sprains lead to chronic ankle instability (CAI) in about 70% of cases. Patients with CAI commonly exhibit a number of sensorimotor deficits, like disturbed postural control and diminished performance. It was hypothesized that targeting the fibularis muscles may have a therapeutic effect on sensorimotor function and decreasing the risk of future ankle sprains in CAI patients. This study was aimed to evaluate the effect of trigger point dry needling (TrP-DN) of fibularis muscles on postural stability and functional performance in athletes with CAI

Materials and Methods: Thirty participants with CAI were randomly allocated into two experimental groups of dry needling (DN) and sham-DN. The participants were tested for static and dynamic postural stability using Biodex Balance Test (BBT) and Y-Balance Test (YBT) respectively. Functional performance assessments were conducted using triple hop test and figure of 8 hop test. All of the participants underwent these tests before and immediately after a single session of intervention. Statistical analysis was performed using independent and paired t-tests

Results: Static and dynamic postural stability were improved significantly after a single session of DN ($P < 0.05$), while the improvement in sham-DN group was not statistically significant ($P > 0.05$). Functional performance remained unchanged in both groups ($P > 0.05$)

Conclusion: A single session of TrP-DN of fibularis longus and brevis is an effective way to immediately improve static and dynamic postural stability in athletes with CAI. Therefore, it may be considered as a potential preventive and rehabilitative intervention in clinical practice for patients with CAI

Keywords: Ankle Instability, Dry-Needling, Trigger-Point

Ultrasound Assessment of the Diaphragm and Abdominal Muscles among Elite Wrestlers with and without Low Back Pain- a Case-Control Study

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Introduction: Low back pain (LBP) affects up to 80% of the population and is also common in athletes, with 33-84% experiencing it during their careers. A U-shaped link exists between activity and LBP: moderate exercise supports health, but inactivity or excessive training increases risk. Elite athletes (>10 hrs/week) face greater spinal strain, often impairing performance. Wrestlers show a 59% lifetime prevalence, largely due to lumbar hyperextension, twisting, and forceful movements. LBP is linked to impaired spinal stabilization involving the diaphragm and core muscles (TrA, IO, EO), which regulate intra-abdominal pressure and stability. Studies show altered abdominal and diaphragm function in individuals with LBP, with reduced diaphragm thickness, excursion, and higher fatigability. While prior research has focused on non-athletes or mixed groups, this study investigates diaphragm function and abdominal muscle activity specifically in elite wrestlers with and without LBP. Materials and Methods: This case-control study, conducted under STROBE guidelines at Iran University of Medical Sciences (Tehran, Apr-Nov 2024), investigated diaphragm and abdominal muscle function in elite Iranian wrestlers with and without low back pain (LBP). Ethical approval and informed consent were obtained. Sample & Participants: Thirty male national-level wrestlers (18-35 years) were enrolled: 15 with chronic/recurrent LBP (VAS 3-6 cm) and 15 controls without LBP in the past year. Exclusion criteria included congenital, rheumatic, neuromuscular or respiratory disorders, BMI >30, prior surgery, lower-limb injuries, and >4 weeks reduced activity. Groups were matched demographically. Outcomes: The primary measure was diaphragm thickness difference (inspiration-expiration), with secondary outcomes including diaphragmatic excursion and activity of abdominal muscles (TrA, IO, EO). Methods: Ultrasound imaging (Samsung SONOACE R7, 9-12 MHz) was used. A physiotherapist performed all scans with minimal probe pressure. Abdominal muscle thickness was recorded at rest and during an active straight leg raise (ASLR). Activity was expressed as % change from rest. Diaphragm thickness was measured in the zone of apposition (8th-9th intercostal spaces) at end-inspiration and expiration. Excursion was assessed in M-mode during maximal breathing. All measures were repeated three times, with mean values analyzed. Reliability was tested in 20 participants (10 per group) within the same session. Analysis: SPSS v27 was used. Normality was assessed with Shapiro-Wilk. Independent t-tests or Mann-Whitney U tests compared groups ($p<0.05$). Intra-class correlation coefficients (ICCs) assessed measure-

ment reliability, interpreted as poor (<0.40), fair (0.40-0.59), good (0.60-0.74), or excellent (0.75-1.00).

Results: Participants' demographics showed no significant differences in age or BMI (P>0.05). Comparisons of abdominal muscle activity and diaphragm parameters revealed significant group differences: elite wrestlers without LBP had greater IO activity and larger diaphragm thickness change, while those with LBP showed higher EO activity. No other differences were observed. Reliability of measurements was excellent, with ICCs ranging from 0.76-0.97 for abdominal muscles and 0.77-0.97 for the diaphragm.

Conclusion: This case-control study compared diaphragm and abdominal muscle function in elite wrestlers with and without low back pain (LBP) using ultrasound. Wrestlers without LBP showed greater internal oblique (IO) activity and diaphragm thickness change, while those with LBP had higher external oblique (EO) activity. Diaphragm excursion did not differ significantly. Reduced diaphragm thickness change in the LBP group indicates impaired contractility, leading to insufficient intra-abdominal pressure and greater lumbar load. Findings align with prior studies showing reduced stabilizing muscle activity (TrA, IO) and compensatory EO overactivation in LBP. Limitations include focus on elite wrestlers and cross-sectional design. In conclusion, wrestlers with LBP demonstrate impaired diaphragm and IO function with increased EO activity, highlighting the potential value of targeted muscle training in LBP management.

Keywords: LBP, Wrestler, Abdominal Muscle, Diaphragm, Ultrasonography

The Effects of Adding a Selective Neuromuscular Training Program to Traditional Basketball Exercises on Musculoskeletal Risk Factors in Semi-professional Basketball Players

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Introduction: Basketball is a dynamic sport that involves frequent jumping, landing, and rapid directional changes, exposing athletes to a high risk of non-contact lower limb injuries, particularly anterior cruciate ligament (ACL) injuries. Neuromuscular training programs have been suggested as an effective strategy to improve movement control and reduce risk factors associated with such injuries. The present study aimed to examine the effect of incorporating selected neuromuscular exercises into regular basketball training on specific risk factors in semi-professional adolescent basketball players.

Materials and Methods: This quasi-experimental study with a pre-test-post-test design was conducted on 30 male basketball players aged 13-18 years, randomly assigned to experimental and control groups. The experimental group performed neuromuscular exercises—including balance, plyometric, resistance, and core stability drills—for 20 minutes during warm-up in addition to regular basketball training, three sessions per week for eight weeks. The control group only completed regular 90-minute basketball practic-

es. Outcome measures included jump-landing technique (LESS), knee valgus and flexion angles, dynamic balance (Y-balance test), knee joint proprioception (digital goniometer), isometric muscle strength (digital dynamometer), and trunk extensor endurance (Biering-Sorensen test). Data were analyzed using the Shapiro-Wilk test and two-way ANOVA.
Results: The findings indicated significant improvements in jump-landing mechanics and isometric muscle strength in the experimental group compared to controls ($p<0.05$). However, no significant changes were observed in dynamic balance, trunk extensor endurance, knee valgus and flexion angles, or proprioception at 30° and 60° knee flexion ($p>0.05$).
Conclusion: In conclusion, integrating neuromuscular exercises into basketball training for adolescents can improve certain injury-related risk factors and may serve as a preventive strategy against lower limb injuries. Further research in different age groups, genders, and levels of play is recommended to confirm and generalize these findings.
Keywords: Neuromuscular Exercises

Anodal vs Cathodal tDCS Priming Effects on Exercise Training Outcomes in Patients with Knee Osteoarthritis

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Introduction: Knee osteoarthritis (KOA) is a progressive musculoskeletal disorder. It leads to pain, joint dysfunction, and reduced quality of life (QOL). Exercise therapy is the cornerstone of treatment. However, many patients continue to experience pain despite regular exercise, which indicates the involvement of central pain mechanisms. Transcranial direct current stimulation (tDCS) is a neuromodulatory intervention that targets these central pathways and may improve rehabilitation outcomes. The relative efficacy of anodal tDCS (atDCS) over the primary motor cortex (M1) versus cathodal tDCS (ctDCS) over the primary somatosensory cortex (S1) is still unclear.
Objectives: This study compared the effects of atDCS and ctDCS, combined with exercise therapy, on pain modulation, function, kinesiophobia, balance, and QOL in KOA patients.
Materials and Methods: A double-blind, randomized controlled trial was conducted with 45 KOA patients. Participants were allocated into three groups: (1) exercise therapy with sham tDCS, (2) exercise therapy with atDCS on M1, and (3) exercise therapy with ctDCS on S1. Stimulation was applied at 1.5 mA for 20 minutes per session. Each group received three sessions per week for four weeks. Pain, function, kinesiophobia, balance, and QOL were assessed at baseline, during treatment, and four weeks after intervention.
Results: All groups showed significant improvements over time ($p \leq 0.05$). The atDCS

group had the greatest pain reduction (p = 0.024). The ctDCS group showed the largest gains in QOL. Between-group analysis revealed significant differences in pain and kinesiophobia between atDCS and control groups (p ≤ 0.036). Importantly, improvements in pain and function reached the minimal clinically important difference (MCID), indicating that changes were not only statistically significant but also clinically meaningful.
Conclusion: Both atDCS and ctDCS enhanced the therapeutic effects of exercise in KOA. In clinical practice, combining exercise therapy with atDCS appears to be the most effective strategy for long-term pain reduction and functional improvement. Nonetheless, exercise alone also provides substantial benefits and remains a strong treatment option. Future studies should focus on optimizing stimulation parameters and evaluating long-term outcomes to maximize the role of tDCS in KOA rehabilitation.
Keywords: knee Osteoarthritis, tDCS, Exercise Therapy, Pain

Effects of Caffeine and Total Motion Release on Cognitive Function in Semi-Professional Sprinters: A Randomized Controlled Trial

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Introduction: Rapid and accurate decision-making is crucial in high-intensity sports such as sprinting. Nutritional aids like caffeine and movement-based warm-up protocols such as Total Motion Release (TMR) have been suggested to enhance cognitive performance. However, little is known about their comparative and combined effects. This study aimed to investigate the influence of caffeine and TMR on cognitive outcomes (reaction time and accuracy) in semi-professional male sprinters.
Materials and Methods: In this randomized controlled trial, 56 semi-professional male sprinters (ages 19-40) were assigned to four groups: control, caffeine (200 mg), TMR, and caffeine + TMR. Participants performed computer-based Stroop and Eriksen Flanker tasks before and after interventions. Caffeine groups ingested a 200 mg tablet one hour before testing, while TMR groups performed a 20-minute standardized TMR warm-up protocol. Outcomes included congruent and incongruent reaction times and accuracy in both tasks. Data were analyzed with ANOVA, Kruskal-Wallis, and within-group comparisons.
Results: Caffeine significantly reduced Flanker congruent reaction time (ES = 1.53, p < 0.001) and, together with TMR, improved incongruent reaction time (p < 0.001). TMR alone also improved Flanker incongruent reaction time (ES = 0.858, p = 0.004). Combined caffeine + TMR had the largest overall effect on cognitive reaction times, but also slightly increased heart rate. Stroop test accuracy remained stable across groups, while Flanker

accuracy improved significantly only in the TMR group (p = 0.039).
Conclusion: Caffeine improved cognitive processing speed, particularly for simple congruent tasks, while TMR enhanced both accuracy and incongruent reaction times. Their combination produced the most substantial improvements in reaction speed, with minor cardiovascular stimulation. These findings suggest that caffeine and TMR may be practical tools for physiotherapists to optimize cognitive readiness in sprinters and athletes in high-speed sports.
Keywords: Caffeine, TMR, Cognitive-Performance, Sprinting, Physiotherapy

The Different Effects of Diaphragmatic Breathing and Aerobic Exercise on Quality of Life in Reflux Patients. A Comparative Study

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Introduction: Gastro esophageal reflux disease (GERD) is a common disorders in the word with an increasing prevalence. Reflux can impaired pulmonary function and quality Of Life (QOL) of the patients. Increasing in Lower Esophageal Sphincter (LES) can improve reflux symptoms. Diaphragmatic breathing can Activate diaphragm muscle and increase LES pressure. The aim of this study was to compare the positive effects of diaphragmatic breathing and aerobic exercise on QOL and LES pressure of the sever reflux patients.
Materials and Methods: This is a clinical trial that conducted among severe GERD patients. 75 eligible patients were selected and then randomly assigned in to three groups of diaphragmatic breathing, Aerobic exercise and control. Study was conducted for 8 weeks. QOL and LES pressure were measured before and after the study by Questionory and Manometry method respectively.
Results: diaphragmatic breathing had significantly more effects on QOL than aerobic exercise (p=0.003). Diaphragmatic breathing had positive effects on LES pressure (p=0.001). Aerobic exercise can significantly improve quality of life in patients (p=0.02) but, no significantly change in LES pressure (p=0.38). There was no change in control group in both variables.
Conclusion: Diaphragmatic breathing improved Both LES pressure and QOL of the reflux patients. Diaphragmatic breathing had more effects on QOL than aerobic exercise so, the reflux patients that have some orthopedic problem and disable person who cannot do aerobic exercise can profited by diaphragmatic breathing to improve their reflux symptoms.
Keywords: Diaphragmatic Breathing, Aerobic Exercises, Reflux

The Effect of Frontal-Plane Focused Balance Training on Fall Prevention in Chronic Stroke Survivors: A Randomized Controlled Trial

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Introduction: This study investigated the impact of frontal plane-focused balance training (FPBT) on fall prevention in stroke survivors.

Material & Methods: 59 chronic stroke survivors (mean age: 52.24±16.35, 18 female) were divided into the FPBT and control group, both underwent an 8-week training program with three one-hour sessions weekly, incorporating single- and dual-task balance exercises. Primary outcomes included fall numbers and faller odds, while secondary outcomes assessed balance function using the Berg Balance Scale (BBS), Mini-Balance Evaluation Systems Test (Mini-BEST), Activities-Specific Balance Confidence Scale (ABC), and Fall Risk for Older People in the Community (FROP-Com).

Result: No statistically significant differences were found in fall numbers or faller odds between the groups during the training (P=0.768 and P=0.065) or follow-up period (P=0.461 and P=0.298), using Negative binomial and Logistic regression, respectively. A declining trend in fall risk was observed in the FPBT group compared to the control group. Both groups showed significant improvements in secondary outcomes (BBS: P=0.013, Mini-BEST: P<0.001, ABC: P<0.001, and FROP-Com: P<0.001), with no significant between-group differences (BBS: P=0.395, Mini-BEST: P=0.295, ABC: P=0.186, and FROP-Com: P=0.886).

Conclusion: The findings suggest that while FPBT did not significantly outperform conventional balance training in reducing falls, a trend toward fall risk reduction was observed. Further research is needed to optimize FPBT's effectiveness for stroke survivors.

The present study was registered in the Iranian Registry of Clinical Trials (No: IRCT20220703055350N1).

Keywords: Balance, Frontal-Plane, Stroke, Fall

خلاصه مقالات پوستر

Poster Presentations

Comparing the Effects of Anodal and Cathodal Transcranial Direct Current Stimulation of Primary Motor Cortex at Varying Intensities on Motor Learning in Healthy Young Adults

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Introduction: Inconsistent results are observed in the effects of transcranial direct current stimulation (tDCS) with different montages on motor learning. This study aimed to compare the effects of anodal and cathodal tDCS over primary motor cortex (M1) at different intensities on motor learning in healthy young adults.
Materials and Methods: The participants were randomly divided to: 1) 1mA M1 c-tDCS, 2) 1mA M1 a-tDCS, 3) 2 mA M1 c-tDCS, 4) 2 mA M1 a-tDCS and 5) M1 sham tDCS groups. The groups received 20-minute stimulation with serial response time test (SRTT) incidentally, while the tDCS was turned off after 30 seconds in sham tDCS group. Response time (RT) and error rate (ER) during SRTT were assessed prior, during and 72 hours after the intervention.
Results: The results of paired T-test indicated that online learning occurred in all groups ($P<0.05$), except in M1 c-tDCS (1 mA) ($P>0.05$). One-way ANOVA analysis also indicated that there were differences in offline learning (RT ($F(DF)=5.19(4)$; $P<0.001$; and ER ($F(DF)=9(4)$, $P<0.0001$) among groups, with more offline learning in 1mA M1 a-tDCS, 2 mA M1 c-tDCS, and 2 mA M1 a-tDCS groups ($P<0.05$). On the other hand, the 1 mA M1 c-tDCS group did not indicate any consolidation effect and even a trend toward negative offline learning.
Conclusion: M1 a-tDCS with different intensities and also 2 mA M1 c-tDCS may be helpful for the enhancement of motor learning in young healthy adults. This study enhances our understanding of tDCS intensity and polarity effects on motor learning, with potential for optimizing therapeutic protocols.
Keywords: Motor learning, tDCS, M1, SRTT

Various Needling Techniques in Chronic Low Back Pain Patients: A Review of Efficacy and Mechanisms

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Introduction: Chronic low back pain (CLBP) is a pervasive and debilitating condition with significant socioeconomic impact. While conventional treatments often provide limited relief, various needling techniques have gained prominence as alternative or complementary interventions. These techniques, which include acupuncture, dry needling, wet needling (trigger point injections), and electroacupuncture, are frequently used in clinical practice, but their comparative efficacy and underlying mechanisms remain a topic of discussion. This review aims to synthesize and critically evaluate the current evidence on the efficacy of different needling techniques for managing pain and improving function in patients with CLBP. Furthermore, it seeks to discuss the proposed neurophysiological and pharmacological mechanisms that underpin their therapeutic effects.
Materials and Methods: Eligible randomized controlled trials were selected according to the PRISMA guideline and identified by a comprehensive search of these keywords: dry Needling, wet Needling, acupuncture, electroacupuncture, chronic low back pain, and related MESH terms of each keyword in several databases including PubMed, Ovid, ScienceDirect, ProQuest, Scopus, Embase, Cochrane Library and Google Scholar. Inclusion criteria were articles in English, full-text availability, and relevance to the research objectives. Exclusion criteria were review articles, posters, presentations, and letters to the editor. 893 records were identified through these database searches and 14 full-text articles met the criteria after screening titles and abstracts.
Results: The evidence suggests that traditional acupuncture is effective for pain relief and functional improvement in CLBP, with effects often persisting in the short to medium term. Dry needling, targeting myofascial trigger points, shows promise in reducing local pain and muscle tension. Wet needling, which involves the injection of an analgesic or saline solution, may provide enhanced and prolonged relief by combining mechanical disruption of trigger points with the pharmacological action of the injected substance. Electroacupuncture may provide enhanced analgesia for some patients. While these techniques appear to be generally safe, the heterogeneity in treatment protocols (e.g., needle placement, substance injected, stimulation method) makes direct comparisons challenging. Proposed mechanisms involve local effects on tissue, segmental inhibition of pain signals, and the activation of supraspinal pathways leading to the release of endogenous opioids.
Conclusion: Various needling techniques represent valuable and minimally invasive options for the management of CLBP. Acupuncture has the most robust evidence base, while dry needling, wet needling, and electroacupuncture offer targeted approaches. The choice of technique may depend on the perceived underlying pain mechanism (e.g., central sensitization vs. peripheral myofascial pain). Future research should focus on head-to-head comparative trials and standardized protocols to better elucidate which technique is most effective for specific CLBP subgroups.
Keywords: Dry Needling, Wet Needling, Acupuncture, Electroacupuncture, Chronic Low Back Pain

The Effect of Preseason Assessments and Injury Prevention Exercises on Reducing Sports Injuries in Volleyball Athletes

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Introduction: Due to the need for repeated jumps, sudden landings, and powerful arm strikes, volleyball exposes athletes to a variety of injuries, including knee injuries (such as patellofemoral syndrome and cruciate ligament rupture), shoulder injuries (such as shoulder impingement and rotator cuff tears), and ankle injuries. Preseason assessments and preventive training design can not only help reduce injury rates, but also improve athletic performance and extend athletes' athletic longevity.
Materials and Methods: This study was conducted in a descriptive-analytical and cross-sectional manner. A sample of 150 volleyball students was selected through cluster random sampling. Data were obtained through a questionnaire (using a camera and analysis software) and clinical examination. Data analysis was performed using chi-square and logistic regression statistical tests.
Results: Studies have shown that using screening and preventive training programs reduces the incidence of knee injuries by 40%. Reduces the likelihood of ankle sprains by 30%. Improves jumping power and technical performance in volleyball players. · A study of college volleyball players showed that implementing preventive programs for 12 weeks reduced knee injuries by 40%. · Non-contact injuries were reduced by 50% according to research on the FIFA 11+ protocol (which has also been adapted for volleyball).
Conclusion: Preseason assessments are a valuable tool for identifying injury risk factors in volleyball players. Combining these assessments with preventive training programs plays a significant role in reducing injuries and improving athletic performance. It is recommended that coaches and sports physicians consider these strategies as an integral part of volleyball team preparation programs.
Keywords: Injuries, Assessment, Volleyball, Prevention Exercises

Altered Lower Limb Kinematics during the Sit-to-Stand Task in Chronic Non-Specific Low Back Pain

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Introduction: Chronic low back pain (CLBP) is a leading cause of disability and a significant socioeconomic burden, yet its etiology is often non-specific and poorly understood. Growing evidence suggests that the pelvis and lower limbs act as a kinetic chain, providing a dynamic foundation for spinal stability and potentially contributing to CLBP pathophysi-

ology. Consequently, assessment of lower limb kinematics is recommended when investigating CLBP mechanisms. This study employed functional data analysis (FDA) to compare the three-dimensional movement kinematics of the pelvis and lower limb joints between individuals with CLBP and healthy controls during a sit-to-stand task.

Materials and Methods: Kinematic data were acquired from the pelvis and lower limbs during sit-to-stand (STS) motion in 20 patients with low back pain (LBP) and 20 asymptomatic controls using a 7-camera Qualisys motion analysis system. The task was divided into pre-lift-off (pre-LO) and post-lift-off (post-LO) phases. A functional data analysis (FDA) approach was applied to compare the continuous, time-normalized kinematic waveforms between groups.

Results: Functional data analysis revealed significant kinematic alterations in the chronic low back pain (CLBP) group during the sit-to-stand task. In the pre-lift-off phase, CLBP subjects demonstrated reduced hip medial rotation on the dominant side compared to controls ($p<0.01$). During the post-lift-off phase, the CLBP group exhibited a more anteriorly tilted pelvis and increased pelvic counterclockwise rotation. At the hip, a more flexed position was observed bilaterally, alongside reduced dominant-side hip abduction and internal rotation. Furthermore, on the dominant side, the CLBP group displayed a more adducted knee position and reduced ankle flexion (all $p<0.05$).

Conclusion: The findings demonstrate that individuals with chronic low back pain (CLBP) exhibit distinct alterations in pelvic and lower limb kinematics during the sit-to-stand task. These deviations were predominantly observed in the dominant limb and were most pronounced during the post-lift-off phase. Consideration of these specific kinematic patterns may inform the development of targeted rehabilitation strategies to improve functional performance in this population.

Keywords: Low-Back-Pain, Sit-to-Stand, Kinematics, Lower-Limb

Effects of Eccentric Exercises with and without Dry Needling Approaches on Patients with Chronic Rotator Cuff Tendinopathy

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Introduction: Evidences showed that eccentric exercises (EE) could be effective on reducing inflammation. Dry needling (DN) can be applied to increase blood flow. This study aimed to evaluate a combined treatment protocol (eccentric exercises and dry needling) to care chronic tendinopathy in rotator cuff tendons.

Materials and Methods: Twenty-eight patients with shoulder pain were recruited for this study. The patients were randomly divided into two groups of treatment including; EE and EE + DN. All patients had eight sessions of EE and one group of patients were under DN as well. They were evaluated four times (before, after third session, after completion and after 72 h of treatment). The patients were evaluated based on their level of pain and function

Results: There was a significant improvement after treatment for all variables in both groups ($P < 0.001$). This improvement level would be constant up to 72 h in the patients

under combined treatment (P > 0.05), while the improvement level was not similar for all outcome measures in the patients under treatment of EE only. These patients showed improvement just in TFAST scale up to 72 h (P > 0.08).
Conclusion: The results showed that EE + DN could be more effective compare than EE alone on treatment of the patients with chronic rotator cuff tendinopathy.
Keywords: Tendinopathy, Eccentric Exercise, Dry Needling

Does whole Body Electrical Stimulation Have Additional Effects on Pain, Physical Performance, Muscle Strength and Endurance in Individuals with Patellofemoral Pain Syndrome?

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Introduction: Patellofemoral pain syndrome (PFPS) is a common musculoskeletal problem in young, active individuals aged 15 to 30 years, with higher prevalence in women. Among various risk factors, trunk and lower extremity muscle weakness are the most important. Clinical guidelines recommend strengthening exercises for these patients. Whole body electrical stimulation (WBES) is an advanced form of electrical muscle stimulation that activates multiple muscle groups simultaneously. Coordinated stimulation of agonist and antagonist muscles can improve circulation, muscle size, strength, power, and reduce pain. This study aimed to compare the effects of WBES and therapeutic exercises on pain and function in women with PFPS.
Materials and Methods: Thirty-six women aged 18-45 years with PFPS were randomly divided into two groups (18 subjects per group): therapeutic exercise and combined treatment group including the therapeutic exercise with WBES. In therapeutic exercise group, participants were asked to perform the strengthening exercise of the hip, knee and core muscles at least 3 days a week for 7 weeks based on the standard rehabilitation protocol for patients with PFPS. In the combined treatment group, in addition to performing the therapeutic exercises, participants received WBES to strengthen the hip, knee and core muscles for 10 sessions during 7 weeks. Before and immediately after the interventions, the pain intensity using visual analog scale, maximal isometric strength of the lower extremity muscles using a hand-held dynamometry, trunk muscle endurance using functional test of plank and physical performance using a step down test and Kujala Anterior Knee Pain Scale were assessed.
Results: Findings demonstrated a significant interactions of group by time for knee extension ($p = 0.008$, $\eta p2 = 0.19$), knee flexion ($p = 0.005$, $\eta p2 = 0.21$), plunk test ($p < 0.001$, $\eta p2 = 0.46$), step down test ($p = 0.003$, $\eta p2 = 0.23$), kujala questioner ($p = 0.002$, $\eta p2 = 0.10$) and VAS ($p = 0.003$, $\eta p2 = 0.16$). Effect sizes were considered large except for kujala questioner that its effect sizes was considered medium. Further analysis using post-hoc

tests showed that -except for VAS- post intervention values were significantly greater in the WBES group in compared to the exercise group ($p < 0.001$). The VAS values did not show significant between groups difference

Conclusion: The WBES can be an effective alternative and time efficient to therapeutic exercise for developing maximal strength, performance, and core muscle endurance in individual with patellofemoral pain syndrome.

Keywords: PFPS, Strength, Core Muscles, WBES

Study of the Electromyographic Activity in Patellofemoral Pain Syndrome Accompanied by Secondary Myofascial Pain Syndrome, Specifically Affecting the Popliteus Muscle Following Dry Needling: a Randomised Clinical Trial

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Introduction: Myofascial pain syndrome in the popliteus muscle may change motor control in the affected and related muscles due to changes in proprioceptive and nociceptive afferents, which can exacerbate patellofemoral pain syndrome. The primary purpose of the current study was to explore the electromyographic activity of the local and proximal muscles of the knee joint in patellofemoral pain syndrome accompanied by secondary myofascial pain syndrome specifically affecting the popliteus muscle following dry needling.

Materials and Methods: Myofascial pain syndrome in the popliteus muscle may change motor control in the affected and related muscles due to changes in proprioceptive and nociceptive afferents, which can exacerbate patellofemoral pain syndrome. The primary purpose of the current study was to explore the electromyographic activity of the local and proximal muscles of theknee joint in patellofemoral pain syndrome accompanied by secondary myofascial painsyndrome specifically affecting the popliteus muscle following dry needling.

Results: During step-up, the onset and offset latencies of the local and proximal muscles of the knee joint, except for the offset latency of the gluteus maximus muscle (p-value=0.162), significantly decreased in the intervention group compared to the control group (pvalue< 0.046). Additionally, there were no significant differences (p-value>0.116) between the groups in the amplitude ratio of the local and proximal muscles of the knee joint during both step-up and step-down.

Conclusion: The present study revealed that dry needling of the popliteus muscle with secondary myofascial pain syndrome associated with patellofemoral pain syndrome constructively modified the local and proximal motor control of the knee joint during step-up.

Keywords: Dry Needling, MFPS, PFPS, Electromyography

Treatment Success of Combined Intervention with Exercise, Foot Orthoses, and Patellar Taping in Individuals with Patellofemoral Pain Syndrome: Development of Clinical Prediction Rules

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Introduction: The effective management of patellofemoral pain syndrome (PFPS) remains a significant clinical challenge. While various interventions demonstrate short-term efficacy, long-term outcomes are often suboptimal, potentially owing to a lack of understanding regarding which patient characteristics predict treatment success. This study aimed to identify clinical predictors of successful outcomes following a six-week combined intervention of exercise therapy, patellar taping, and prefabricated orthoses in individuals with PFPS.
Materials and Methods: Fifty patients (30 females, 20 males; mean age, 29.4 years) diagnosed with PFPS were assessed for demographic, pain-related, biomechanical, and functional variables. Treatment success was defined as a ≥2-point reduction in the visual analog scale (VAS) score of pain during daily activities and a ≥8-point increase in the anterior knee pain scale (AKPS) score postintervention.
Results: Logistic regression analysis identified several significant predictors of treatment success. A higher body mass index (BMI) and greater maximum pain intensity at baseline were associated with a lower probability of a successful outcome (OR = 0.427, p = 0.043; OR = 0.317, p = 0.027, respectively). Conversely, higher baseline AKPS scores (indicating better function), greater isometric hip internal rotation strength, hip extensor strength, hip abductor strength, and hip external rotation strength were positively associated with treatment success (ORs ranging from 2.583 to 3.858, all $p < 0.05$). Furthermore, hamstring shortness negatively impacted treatment outcomes (OR = 0.497, p = 0.034).
Conclusion: Study findings suggest that a combination of anthropometric measures, pain and functional status, hip muscle strength, and hamstring length can serve as valuable clinical predictors for identifying individuals with PFPS who are more likely to benefit from a combined physiotherapy approach. The identified predictors may aid clinicians in tailoring treatment strategies and improving long-term outcomes for this challenging patient population.
Keywords: Knee Pain, Treatment, Prediction Factor

The Breath-Back Connection: A systematic review

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Introduction: Recent research studies highlight a complex interplay between respiratory function and spinal stability, particularly involving the diaphragm and core stabilizing muscles in individuals with low back pain (LBP).

Objective: This systematic review aimed to investigate diaphragm and stabilizer muscle thickness and function in individuals with LBP compared to healthy subjects during breathing.

Materials and Methods: A comprehensive literature search was conducted in Web of Science, Science Direct, PubMed, Scopus, and Medline databases up to April 2024. Studies assessing the function and thickness of the diaphragm, abdominal muscles, and lumbar multifidus during breathing in individuals with LBP and healthy subjects were included. The Critical Appraisal Skills Program (CASP) checklist was used to assess study quality.

Results: A total of 14 studies met the inclusion criteria, comprising eight case-control and six cross-sectional studies. Findings indicated variations in diaphragm thickness, excursion, and fatigability among LBP patients, with inconsistent evidence regarding its function. Abdominal muscle activity and recruitment patterns differed significantly between LBP patients and healthy controls, with altered transversus abdominis (TrA) and internal oblique (IO) activation. Some studies reported increased TrA and IO thickness in LBP patients, potentially compensating for diaphragm dysfunction, while others observed reduced thickness and activity. Lumbar multifidus size showed no significant differences during breathing.

Conclusion: This review highlights altered diaphragm and abdominal muscle function in individuals with LBP, supporting the theory of a breath-back connection influencing spinal stability. However, inconsistencies in findings suggest a need for further research focusing on LBP subgroups. Understanding these interactions may contribute to improved rehabilitation strategies targeting core muscle function and respiratory mechanics in LBP management.

Keywords: LBP, Respiration, Diaphragm, Abdominal, Multifidus

The Effect of Aquatic versus Land-based Dual-Task Training on Balance and Gait in People with Stroke: A Systematic Review

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Introduction: Balance and gait impairments after stroke increase the risk of falls and limit participation in daily activities. Dual-task training reflects real-life situations, while aquatic environments may enhance training effects through buoyancy, viscosity, and hydrostatic pressure with reduced musculoskeletal load. This systematic review aimed to compare the effects of aquatic dual-task training and land-based dual-task training on balance and gait in people with stroke.

Materials and Methods: A systematic review was conducted through electronic databases including PubMed, Scopus, and Web of Science, covering studies published up to 2025. Eligible studies were controlled trials and randomized controlled trials that compared aquatic versus land-based motor-motor dual task training in patients with stroke. Interventions consisted of comparable motor-motor dual-task programs performed in water (32-35 °C) or on land, delivered 3-5 sessions per week for 4-6 weeks. Outcomes included balance (Berg Balance Scale [BBS], Functional Reach Test [FRT], Five-Times-Sit-to-Stand [FTSST], Biodex stability indices) and gait (Timed Up and Go [TUG], 10-Meter Walk Test [10MWT], Functional Gait Assessment [FGA], and spatiotemporal gait parameters).

Results: Three studies with a total of 100 participants (sample sizes: 20, 50, and 30; post-stroke duration ≥6 months) were included. The reviewed studies indicated that both groups improved after the intervention in balance and gait measures. However, aquatic dual-task training consistently produced greater improvements in BBS, FRT, FTSST, Biodex stability indices, walking speed, step length of affected and non-affected limbs, time of support on the affected side, TUG, and FGA scores. One study also demonstrated that these benefits were maintained at a 2-week follow-up.

Conclusion: Evidence from three trials suggests that aquatic dual-task training is more effective than land-based training for enhancing balance and gait in patients with stroke, likely due to reduced antigravity load and enhanced sensory feedback in water. Larger, well-designed randomized controlled trials with longer follow-up are needed.

Keywords: Stroke, Aquatic Therapy, Balance

Immediate Effects of Superficial Dry Needling on Improving Knee Flexion Range of Motion in Chronic Knee Limitations

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Introduction: Normal knee range of motion (ROM) is crucial for daily functioning. Limitation in knee flexion impairs activities such as stair climbing, sitting and standing, and can reduce quality of life. Chronic knee osteoarthritis is a common cause of knee flexion limitation.
Objective: This study aimed to evaluate the immediate effect of superficial dry needling (SDN) on knee flexion angle (KFA) in individuals with chronic knee osteoarthritis.
Materials and Methods: This study was part of a larger trial and enrolled 20 patients with chronic knee osteoarthritis. Knee ROM was assessed pre-intervention in a prone position by mobile phone photography and subsequently quantified using a mobile goniometry application. After the intervention, the knee angle was measured again using the same procedure by the same rater. In SDN, a needle with a thickness of 0.2 millimeters, was inserted superficially into the surrounding joint fascia and myofascial tissue to a depth of 1 to 2 centimeters (less than the typical dry needling depth), rotated about half a circle, and withdrawn.
Results: Statistical analysis showed that SDN produced an immediate improvement in knee ROM, with a significant enhancement in KFA ($p < 0.001$). A significant difference was observed in KFA after the intervention compared with initial measurements. Significance level was set at $P \leq 0.05$.
Conclusion: Given the observed improvement in knee flexion angle, superficial dry needling may be a promising therapeutic approach for improving knee ROM chronic limitations, and additionally, it is more suitable for individuals with needle phobia, due to shallower depth of needle penetration, leading to better patient cooperation.
Keywords: OA, SDN , ROM, KFA, Goniometry

Association of Physical Function and Pain with Lower Muscle Strength and Trunk Muscle Endurance in Subjects with Patellofemoral Pain Syndrome

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Introduction: This study investigated the association of knee pain severity and functional performance with hip and knee muscle strength and trunk endurance in individuals suffering from patellofemoral pain syndrome (PFPS).

Materials and Methods: This cross-sectional study included 50 participants diagnosed with PFPS. An 11-point visual analog scale (VAS) was used to assess knee pain severity, and the Anterior Knee Pain Scale (AKPS) quantified functional ability. Hip extensors, abductors, medial and lateral rotators, and knee extensors were tested for strength using a handheld dynamometer. Trunk endurance was assessed through plank tests in anterior, posterior, and lateral positions.

Results: A significant inverse relationship was identified between pain intensity and functional performance ($r = -0.504$, $p < 0.001$). Body mass index (BMI) exhibited a negative association with performance ($B = -7.459$, $p = 0.021$). Knee extensor strength ($B = 0.156$, $p < 0.0001$) and lateral plank endurance ($B = 1.457$, $p = 0.002$) showed positive associations with functional performance.

Conclusion: Higher pain levels and BMI were associated with poorer function in individuals with PFPS. Conversely, stronger quadriceps and greater lateral core endurance were linked to better functional outcomes.

Keywords: Physical Function, Patellofemoral Pain Syndrome

The Effect of Virtual Reality during Manual Therapy Techniques on Pain Intensity in Physiotherapy of Patients with Total Knee Arthroplasty: A Protocol for a Prospective Randomized Controlled Trial

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Introduction: Pain management during physiotherapy treatment of patients with total knee arthroplasty (TKA) is challenging. Considering virtual reality (VR) as an emerging technology, it seems that using VR in the physiotherapy of this group of patients is one of the pain management solutions. Therefore, this study aims to examine the effect of combining VR during manual therapy on pain intensity in patients with TKA.
Materials and Methods: This assessor-blinded randomized controlled trial will include 52 participants who will be randomly assigned into two groups: (a) an intervention group receiving manual therapy combined with VR, and (b) a control group receiving conventional physical therapy. Conventional physical therapy consists of electrotherapy, cryotherapy, manual therapy techniques, and exercise therapy. Both groups will complete 10 treatment sessions. The primary outcome will be pain intensity, while secondary outcomes will include active range of motion, functional disability of the knee joint, treatment satisfaction, and adherence to exercises.
Results: To the best of our knowledge, this study will be the first to investigate using VR and manual therapy together in patients who have had total knee arthroplasty. If VR proves effective in reducing pain, it could be recommended as a complementary option in routine physiotherapy for these patients.
Conclusion: This protocol is intended to assess the potential benefits of incorporating virtual reality into conventional physical therapy for patients with total knee arthroplasty.
Keywords: Virtual Reality, Physical Therapy, Pain

Integration of Virtual Reality and Artificial Intelligence in Vestibular Rehabilitation: Evidence from 2015-2025

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Introduction: Vestibular dysfunction often leads to dizziness, imbalance, and impaired daily functioning. Conventional vestibular rehabilitation therapy (VRT) is clinically effective but limited by variability in patient adherence and therapist-dependent customization. Over the last decade, Virtual Reality (VR) and Artificial Intelligence (AI) have emerged as innovative tools in rehabilitation. VR offers immersive environments that enhance sensory integration and patient engagement, while AI enables adaptive, data-driven personalization of treatment.
Objective: To synthesize evidence from 2015-2025 on the role of VR and AI in vestibular rehabilitation, with emphasis on clinical outcomes, patient engagement, and future implications for physiotherapy practice.
Materials and Methods: A narrative review of PubMed-indexed studies (2015-2025) including randomized controlled trials, systematic reviews, and meta-analyses was conducted. Articles addressing VR, AI, or their combination in vestibular rehabilitation were included. Primary outcomes were dizziness reduction, balance improvement, gait performance, and adherence to therapy.
Results: Virtual Reality: Studies consistently demonstrate that VR-based interventions improve the Dizziness Handicap Index (DHI), postural stability, and gait outcomes. Systematic reviews (Heffernan et al., 2021; Hazzaa et al., 2023) confirm VR's superiority over conventional VRT in short-term recovery. Artificial Intelligence: Recent applications (Li et al., 2022; Kim et al., 2024) highlight AI's role in customizing exercise intensity, predicting fall risk, and monitoring progress through machine learning algorithms and wearable sensors. Combined VR-AI Approaches: Pilot trials show that AI-enhanced VR systems adapt therapy in real-time, leading to higher engagement, reduced dropout rates, and improved balance compared to static VR protocols. Challenges: Variability in protocols, small sample sizes, and lack of standardized AI algorithms remain barriers to clinical translation.
Conclusion: VR and AI represent complementary, transformative technologies in vestibular rehabilitation. VR improves immersion and adherence, while AI ensures individualized, adaptive therapy. Together, they have the potential to redefine physiotherapy practice by enhancing treatment precision and patient outcomes. Future multicenter trials with standardized methodologies are essential to establish long-term effectiveness and integration into clinical guidelines.
Keywords: Virtual Reality, Artificial Intelligence, Vestibular

Advances in Neuromodulation and Pelvic Floor Muscle Training for Neurogenic Bladder and Lower Urinary Tract Dysfunction

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Introduction: Neurogenic bladder (NB) and lower urinary tract dysfunction (LUTD) are common complications of neurological conditions such as spinal cord injury (SCI), multiple sclerosis (MS), Parkinson's disease (PD), and stroke, with prevalence rates ranging from 7-90%. These conditions lead to symptoms including urinary incontinence, urgency, frequency, and retention, significantly impacting quality of life. Minimally invasive physiotherapy interventions, such as electrical neuromodulation and pelvic floor muscle training (PFMT), have emerged as effective treatments for managing NB and LUTD, offering non-pharmacological and non-surgical options to improve bladder control and associated symptoms.

Objective: This review aims to evaluate the efficacy and applications of neuromodulation techniques and PFMT in the management of NB and LUTD, highlighting their role in improving bladder function, sexual health, and overall quality of life in patients with neurological impairments.

Materials and Methods: A comprehensive review of current literature and clinical evidence was conducted, focusing on minimally invasive physiotherapy interventions for NB and LUTD. Data were synthesized from studies on transcutaneous electrical nerve stimulation (TENS), sacral nerve stimulation (SNS), transcutaneous tibial nerve stimulation (TNS), percutaneous tibial nerve stimulation (PTNS), interferential medium frequency current (MFC), repetitive transcranial magnetic stimulation (rTMS), PFMT, and acupuncture. Treatment parameters, such as pulse rate (20-30 Hz), intensity (10-20 μs), and electrode placement, were analyzed, alongside contraindications and patient outcomes. The review also included evidence on PFMT for sexual dysfunction in MS and stroke patients and bowel dysfunction management in SCI populations.

Results: Electrical neuromodulation techniques, including TENS, SNS, TNS, and PTNS, demonstrated significant efficacy in modulating spinal reflexes and restoring the balance of excitatory and inhibitory impulses for bladder control, particularly in patients with overactive bladder (OAB) and SCI (Level 1 evidence). PFMT, often combined with electrostimulation or acupuncture, improved pelvic floor muscle tone, reducing incontinence and enhancing sexual function in both men and women with MS and post-stroke LUTD. MFC and rTMS showed promise in managing NB and neuropathic pain, though clinical outcomes varied.

Conclusion: Neuromodulation and PFMT are effective, minimally invasive physiotherapy interventions for managing NB and LUTD in patients with neurological conditions. These therapies improve bladder function, reduce incontinence, and enhance sexual and bowel function, thereby improving quality of life. Tailored treatment protocols, considering patient-specific contraindications and neurological profiles, are essential for optimizing outcomes. Further research is needed to standardize protocols for emerging therapies like MFC and rTMS and to compare their efficacy with established interventions.

Keywords: Neurogenic Bladder, Neuromodulation, Pelvic Floor

Reliability of Cervical Sensorimotor Function Assessment and Cervical Relocation Test to the Neutral Head Position in Healthy Subjects

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Introduction: Impairment of cervicocephalic and head joint position sense plays an important role in recurrent and chronic cervicocephalic pain. Several methods have been suggested to assess cervicocephalic proprioception. Among them, reconstruction of the cervical angle is considered a clinical criterion, although its reliability has not been fully established.
Objective: The present study aimed to investigate the intra-rater reliability of cervical sensorimotor function and the cervical relocation test in healthy individuals.
Materials and Methods: Twenty-four healthy participants (mean age: 25.70 ± 6.08 years) were recruited through simple non-probability sampling in a single-group repeated-measures reliability design. Participants were instructed to relocate their head to the neutral position as accurately as possible after performing full active cervical flexion, extension, and left and right rotations. Each movement was repeated five times. A laser pointer was mounted on the participant's head, and the distance (cm) between the zero reference point and the repositioned point was recorded. Intra-class correlation coefficients (ICCs) with 95% confidence intervals (CI) and the standard error of measurement (SEM) were calculated.
Results: The results demonstrated good to excellent intra-rater reliability across movements. ICC values were 0.75 for flexion (good), 0.81 for extension (very good), 0.64 for right rotation (good), and 0.64 for left rotation (good).
Conclusion: The cervicocephalic relocation test to the neutral head position using a laser pointer provides a reliable method for assessing cervical sensorimotor function. This test can therefore be recommended for evaluating cervicocephalic proprioception in patients with cervicocephalic pain.
Keywords: Proprioception, Intra-rater Reliability, Neck Pain

Comparison of Neuro-Cognitive Functions between Athletes in Open and Closed Skill Sports

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Introduction: Studies suggest that type of cognitive load inherent in different sports may play a critical role in determining their impacts on different domains of neuro-cognitive function. However, cognitive domains involved in different types of sport, including open and closed skill sports continue to be a debated topic. This systematic review aimed to investigate the differences in neuro-cognitive functions between athletes in open and closed skill sports.
Materials and Methods: A systematic review was conducted by searching databases, including PubMed, Scopus, and Web of science for articles published until August 2025. Eligible studies included cohort and cross-sectional studies that compared neuro-cognitive functions among the open and closed skill sports. Open skilled sports included basketball, volleyball, tennis, handball, soccer and football, while closed skilled sports included swimming, running, track &field, cycling and gymnastic. Outcome measures were correctness of working memory task, visual tracking accuracy, Go/No-Go inhibitory failures, stop signal reaction times, total times of trail making test, reaction time of color-word stroop task, flanker task shifting, and 2-back task.
Results: In total, seven studies involving 376 participants met the inclusion criteria. Five studies found that athletes in open-skill sports performed better on measures of working memory, visual attention, cognitive flexibility, selective attention and visual search skills. While two studies showed no significant differences in cognitive task performance measures between open and closed skill sport players. Additionally, two studies demonstrated significant interaction between the sport type and sex. So that, one of them revealed that long-term open-skill sports reduced sex differences. Another study exhibited that females scored higher on stroop tasks, while males in closed-skill sports showed better sustained attention. However significant variations existed in the tools used to assess cognitive performance and types of sports categorized under open and closed skills groups.
Conclusion: The results of this systematic review suggest superior performance in attention, memory, and executive functions in athletes in open-skill sports. Moreover, sex may be a potential factor affecting neuro-cognitive functions in athletes in open and closed skill sports.
Keywords: Neuro-Cognition, Open/ Closed Skill Sport

Effects of Diaphragm Myofascial Release on Pain, Disability, Range of Motion, Kinesiophobia and Quality of Life in Patients with Chronic Shoulder Pain

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Introduction: Shoulder pain is the third most common musculoskeletal disorder that causes pain in the arm, shoulder, and upper shoulder areas, as well as stiffness and decreased range of motion. The diaphragm, as the main respiratory muscle, is closely related to the shoulder joint, and dysfunction of this muscle can affect the shoulder joint. Myofascial release of the diaphragm muscle may help reduce pain and improve function in chronic shoulder pain. The present study was conducted to determine the effect of myofascial release of the diaphragm muscle in patients with chronic shoulder pain.

Materials and Methods: This double-blind randomized clinical trial study was conducted on 25 patients with chronic shoulder pain who were divided into two intervention and control groups. Both groups received six sessions of routine physiotherapy on alternate days. Routine physiotherapy included the use of low-frequency TENS, hot pack, and therapeutic exercises in the clinic and at home. The intervention group received myofascial release technique of the diaphragm muscle in addition to routine physiotherapy. Evaluation of variables such as pain, range of motion, chest expansion, disability, quality of life, and kinesiophobia was performed before and after six treatment sessions.

Results: The mean pain during rest and activity, shoulder external rotation range of motion, and disability improved significantly before and after treatment in both intervention and control groups. Shoulder abduction range of motion and quality of life improved significantly only in the control group after treatment, and the changes in kinesiophobia and chest expansion were not statistically significant. No significant changes were observed between the two groups, except for shoulder abduction range of motion, which was in favor of the control group.

Conclusion: According to the overall results of the study, it can be concluded that the use of the diaphragm myofascial release method in patients with chronic shoulder pain along with routine physiotherapy treatment has led to a reduction in pain and disability in patients, but there is no evidence that adding this treatment can bring more significant changes to the treatment of patients.

Keywords: Shoulder Pain, Diaphragm, Myofascial Release

The Role of Diaphragmatic Myofascial Release in Reducing Abdominal Pain in a Patient with Shoulder Pain: A Case-Based Perspective

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Introduction: Postoperative abdominal and visceral pain is a common complication in patients following appendectomy, especially when associated with peritonitis. The diaphragm, as the primary respiratory muscle innervated by the phrenic nerve (C3-C5), has extensive anatomical and functional relationships with thoracoabdominal and pelvic structures. Fascial restrictions or dysfunction in diaphragmatic movement may contribute to increased intra-abdominal tension and altered visceral mobility, thereby intensifying pain in the abdominal and pelvic regions. These adhesions and fascial tensions can trigger aberrant afferent input, increased sympathetic tone, and protective postural responses that further reinforce pain cycles. In such scenarios, pain is often not limited to the abdominal region but may manifest in more distant structures, including the shoulder.

Materials and Methods: A 45-year-old married woman presented to the outpatient physiotherapy clinic with a primary complaint of chronic right anterior shoulder pain persisting for approximately one year. The pain was localized to the acromial region and lateral aspect of the deltoid, described as dull and activity-dependent. The patient received a total of six treatment sessions over two weeks(three sessions per week, every other day). In addition to standard physiotherapy, six sessions of diaphragmatic myofascial release were administered. Outcome's measure was Pain that assessed using the Visual Analog Scale (VAS), chest expansion by tape measure, the Shoulder Pain and Disability Index by SPADI, and the satisfaction by SF-12 quality of life questionnaire.

Results: Shoulder Pain intensity decreased during daily activities and completely resolved at rest. Chest expansion improved substantially, disability related to shoulder function reduced, and both physical and mental components of quality of life improved. Importantly, the patient reported approximately a 90% reduction in chronic abdominal pain in the right lower quadrant.

Conclusion: Based on the findings of this case report, diaphragmatic myofascial release appears to be an effective adjunctive treatment for improving shoulder symptoms and chronic abdominal pain following abdominal surgery.

Keywords: Abdominal Pain, Appendectomy, Diaphragmatic Release

Multimodal Physiotherapy Following Patellar Stabilization Surgery in Five Small-Breed Dogs: A Case Series

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Introduction: Background: Medial patellar luxation (MPL) is a common orthopedic condition in small-breed dogs, often requiring surgical stabilization. Despite anatomical correction, residual lameness, muscle atrophy, and restricted joint mobility are frequent postoperative challenges.

Objectives: This case series aimed to evaluate the effectiveness of a structured multimodal physiotherapy protocol in enhancing functional recovery after MPL stabilization in small-breed dogs.

Materials and Methods: Five dogs with grade III-IV MPL underwent surgical correction followed by a standardized four-week rehabilitation program comprising neuromuscular electrical stimulation, therapeutic ultrasound, manual therapy, and targeted functional exercises. Each dog completed 12 sessions. Outcome measures included quadriceps girth, passive stifle extension, lameness scores, and the Timed Up and Go (TUG) test, assessed at baseline, post-treatment, and one-month follow-up.

Results: Conclusion: To our knowledge, this is the first multi-case veterinary report documenting a structured multimodal rehabilitation protocol with quantifiable outcomes in small-breed dogs following MPL stabilization. These findings highlight the clinical value of integrating early physiotherapy into postoperative care to improve prognosis, mobility, and quality of life.

Keywords: Medial Patellar Luxation, Canine Rehabilitation

Comparison of the Effects of Trigger Point Dry Needling versus Neural Mobilization on Radiating Pain and Functionality in Subjects with Lumbar Radiculopathy due to Disc Herniation: A Randomised Controlled Trial

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Introduction: One of the most common painful problems is lumbar radiculopathy due to disc herniation known as low back pain radiating to one or both lower extremities. It is importance to pay attention to the muscles of the lumbar, hip, knee, and leg area in patients with lumbar radiculopathy and sciatic nerve entrapment under these shortened muscles. Hence, using therapeutic interventions to eliminate trigger points and release the sciatic nerve beneath these muscles are required. Therefore, the present study aimed to compare the efficacy of dry needling (DN) versus neural mobilization in patients with lumbar radiculopathy.
Materials and Methods: Eighty lumbar radiculopathy patients aged between 21 and 50 years old with diagnosis of disc herniation were randomly assigned to 4 groups of neural mobilization (n = 20), DN(n=20), combined DN and neural mobilization (n= 20), and control (n = 20) through the block randomization. The experimental groups received interventions three times a week up to 6 sessions. Radiating pain intensity and functionality were measured using numerical pain rating scale (NPRS), the Oswestry Disability Index (ODI) and Roland-Morris Disability (RMD) questionnaires, respectively. Variables were collected in three stages of before, immediately after, and one month after end of interventions.
Results: The DN, neural mobilization, and especially the combined group exhibited substantial reductions in pain from baseline to one-month follow-up, with mean decreases exceeding the MCID threshold (≥2 points or ≥30%). The combined group demonstrated the largest improvement (~83% reduction). These findings suggest combined approach, were clinically and statistically superior in reducing pain intensity. Also, the combined group showed the most pronounced improvement (−42.5 points) in functionality. These results highlight the strong functional benefit of active interventions, particularly when combined, in improving disability related to low back pain ($P \leq 0.05$).
Conclusion: This study demonstrated that the combined intervention of DN and neural mobilization was the most effective in improving outcomes compared to DN and neural mobilization alone. Also, DN and neural mobilization groups showed similar improvements in the pain intensity and functionality scores after intervention and at the end of one month. These findings suggest that these treatments can optimize recovery and improve rehabilitation outcomes in patients with lumbar radiculopathy.
Keywords: Disc Herniation, Dry Needling, Sciatic

Comparison of the Effects of Physiotherapy and Platelet-Rich Plasma Injection on Pain, Functionality, and Range of Motion in Patients with Knee Osteoarthritis: A Randomized-Controlled Study

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Introduction: Osteoarthritis (OA) is the most common destructive and progressive disease in the elderly population that it causes physical problems such as pain, muscle spasm, joint stiffness, degenerative changes in cartilage and functional disorders. Physiotherapy and platelet-rich plasma (PRP) treatments are considered effective methods for knee osteoarthritis treatment. Hence, the aim of the study was to compare the effects of physiotherapy versus PRP and the combination of these interventions for improvement of symptoms in these patients such as pain, functionality, and knee range of motion.

Materials and Methods: Eighty OA patients (mean age: 58.60 ± 7.59 years) were randomly assigned to 4 groups. One group (n=20) received a physiotherapy protocol (modalities, knee mobilization and dry needling techniques) 6 sessions for two weeks and the second group experienced two PRP injection sessions with 4 weeks apart. Group 3 received a combination of physiotherapy protocol and PRP injection and the fourth group was as control group. Visual Analog Scale (VAS), the western Ontario and McMaster questionnaire (WOMAC), knee injury and osteoarthritis outcome score (KOOS) questionnaire, and clinical goniometer used to assess pain intensity, functionality, and knee range of motion (ROM), respectively. Variables were collected before, immediately after, and 2 months after end of interventions.

Results: The combined group demonstrated the greatest improvement, significantly outperforming all other groups after treatment and at two months post-treatment in the VAS and the WOMAC variables ($p < 0.001$). The physiotherapy group also showed better results than the PRP and control groups in these outcomes ($p < 0.001$). Significant differences were observed between control group and all other groups in the KOOS and knee ROM variables ($p < 0.001$). There were no significant differences between PRP and physiotherapy groups. Two months later, all treatment groups were indicated significant improvements compared to control ($p < 0.001$), with combined showing the highest improvement.

Conclusion: The findings indicated the combined intervention was the most effective in improving outcomes compared to physiotherapy and PRP alone. Also, the physiotherapy group showed better results than the PRP and control groups in the pain intensity and functionality scores after intervention and at the end of two months. The PRP and physiotherapy groups were showed same results in the knee OA ROM. Thus, we recommend that a relatively low-cost physiotherapy program can be applied as the primary treatment for knee OA patients.

Keywords: Platelet-Rich Plasma, Osteoarthritis, Dry Needling

Assessing the Measurement Characteristics of Cervical Joint Repositioning Error in Individuals with and without Forward Head Posture

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Introduction: The current study aimed to examine the joint repositioning error (JRE) in three groups of Forward head posture (FHP) with chronic neck pain (CNP), FHP without CNP, and a healthy control.

Materials and Methods: This cross-sectional study involved 30 participants from each group, selected via convenience sampling. Neck pain intensity was quantified using the Visual Analogue Scale (VAS), neck function was examined using the Neck Disability Index (NDI), and FHP was estimated by measuring the craniovertebral angle. The primary outcome measures were the absolute error (AE) and constant error (CE) of joint repositioning during different cervical movements, evaluated using a laser pointer.

Results: ANOVA results showed that the AE of joint repositioning during right and left neck rotation and lateral bending, along with CE in all neck movements except for left rotation ($P = 0.235$), was significantly greater in FHP group with CNP compared to the healthy group ($P < 0.05$). The one-sample t-test showed a significant overshoot for flexion ($P = 0.02$), extension ($P = 0.01$) and right rotation ($P = 0.03$) repositioning ($P = 0.06$) in the FHP with CNP group and for right rotation repositioning ($P = 0.009$) in the FHP without CNP group. Also, a significant overshoot tendency for right ($P = 0.01$) and left ($P = 0.002$) lateral flexion was observed in the asymptomatic group.

Conclusion: The research found that the AE and CE of joint repositioning were higher in the FHP group with CNP compared to the healthy group. Furthermore, there was no significant strong correlation between VAS and NDI with the indices of JRE across different cervical movements.

Keywords: Forward Head Posture, Neck Pain, Proprioception, Neck Muscles, Postural Malalignment

Evaluation of Sonoelastography Parameters of the Sternocleidomastoid Muscle During Craniocervical Flexion Task in Individuals With and Without Forward Head Posture

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Introduction: This study aimed to investigate changes in the stiffness of the sternocleidomastoidmuscle, as an indicator of musclestiffness, during resting and functional contractile states (craniocervicalflexion) in individuals with forwardheadposture (FHP) compared to an asymptomatic control group.

Materials and Methods: In this observational cross-sectional study, 25 individuals with FHP and 25 age-, height-, and weight-matched healthy controls were recruited. The stiffness of the sternocleidomastoidmuscle was measured using shear wave elastography during resting states (supine and seated without contraction) and contractile states (craniocervical flexion at 50% and 100% maximum voluntary isometric contraction [MVIC]). The force generated during craniocervicalflexion was assessed using a load cell integrated into a chair. Data were analyzed using two-way repeated-measures analysis of variance to evaluate the main effects of group, condition, and group-by-condition interaction.

Results: The main effect of condition on the stiffness of the SCM muscle was significant ($p<0.05$), with higher mean stiffness in contractile states compared to resting states. For the sternocleidomastoidmuscle, the main effect of group was significant, with the FHP group exhibiting significantly higher mean stiffness than the control group ($p<0.05$). The group-by-condition interaction was significant for the sternocleidomastoidmuscle, indicating distinct stiffness change patterns between groups.

Conclusion: Increased stiffness in the sternocleidomastoidmuscle can serve as a diagnostic marker for individuals with FHP. Additionally, the sitting position, compared to the lying position, significantly increases the stiffness of the sternocleidomastoidmuscle. Performing craniocervicalflexion movements at 50% and 100% MVIC intensities has a significant effect on the stiffness of the sternocleidomastoid muscle. Therefore, in treatment protocols for individuals with FHP, it is recommended to use the sitting position and craniocervicalflexion movement at 50% intensity in the early stages of rehabilitation. Furthermore, therapeutic exercises should focus on reducing the stiffness of the sternocleidomastoid muscle and strengthening the deep extensor muscles of the neck to improve muscular balance

Keywords: Forward Head Posture, Muscle Stiffness, Elastography, Craniocervical Flexion

The Effect of Breathing Exercises on Lung Function, Anthropometric Parameters and Functional Exercise Capacity: A Scoping Review

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Introduction: Obesity is characterized by excessive accumulation of body fat and is associated with chronic health conditions such as type 2 diabetes mellitus, heart disease, hyperlipidemia, hypertension, obstructive sleep apnea, and depression. Physical activity and nutritional control are the main components of weight loss programs. Obesity imposes a significant burden on the respiratory system. Obesity increases respiratory demands, oxygen cost of breathing, dyspnea during exercise and respiratory muscle fatigue. Breathing exercises may reduce respiratory muscle fatigue and improve exercise tolerance. Given the Breathing exercises may improve respiratory muscle function, increase motivation for physical activity, and promote weight loss. So the objective of this scoping review was to systematically map the research on the effects of breathing exercises on lung function, anthropometric parameters, and functional exercise capacity in subjects with obesity.
Materials and Methods: This study helps to summarize the available literature on the effects of breathing exercises on lung function, anthropometric parameters, and functional exercise capacity in subjects with obesity. This scoping review is conducted following the JBI scoping review methodology. Studies in English or Persian were searched in Cochrane, ISI Web of Science, PubMed, Embase, Scopus, ScienceDirect, CINAHL, PEDro, Magiran, MOH thesis, MOH articles, Irandoc, and SID databases. Randomized controlled trials and quasi-experimental studies involving subjects with obesity (body mass index >30 kg/m^2), regardless of age, gender, or race, and implementing breathing exercises, regardless of setting, country, or follow-up duration, are included. Of the 2077 articles identified, 19 studies were included. 17 studies focused on lung function and 10 studies evaluated anthropometric parameters and functional exercise capacity.
Results: Of 17 studies examined lung function, 8 studies reported improvements in spirometry parameters. In 11 studies, respiratory muscle strength had improved Of 10 studies examined anthropometric parameters, 7 studies reported improvements of anthropometric parameters. In 10 studies, the effect of breathing exercise on functional exercise capacity was considered. Functional exercise capacity was improved in 8 out of the 10 studies.
Conclusion: Breathing exercises can improve lung function, anthropometric parameters, and functional exercise capacity in subjects with obesity. They can be recommended as an adjunct therapy alongside increased physical activity and nutritional control.
Keywords: Anthropometry, Breathing Exercises, Tolerance, Obesity

Measurement Properties of Clinical Standing Balance Tests in Individuals With Knee Osteoarthritis

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Introduction: Standing balance is essential for physical functioning. Therefore, improving balance control is a key priority in the management of knee osteoarthritis (OA), underscoring the importance of accurately assessing standing balance. Purpose: To assess reliability, construct validity and responsiveness of common clinical balance tests, including Step Test, Single-Leg Stance Test, and Functional Reach Test, in patients with knee OA.
Materials and Methods: In the initial session, 100 participants underwent balance tests and completed Persian version of Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) and Timed Up and Go Test (TUG) as comparators for evaluating the construct validity of balance tests. For test- retest reliability, a subset of 70 participants repeated balance tests 1 week after initial assessment. To examine responsiveness, a subset of 90 participants underwent tests and completed WOMAC and TUG at baseline and after completing intervention. At post-intervention assessment, participants also completed global rating of change scale.
Results: Three balance tests showed excellent test-retest reliability (intra-class correlation coefficient >0.75). All balance tests were considered valid and responsive because they confirmed 100% of priori hypotheses. Minimal detectable change (MDC) values were 2.71 steps for Step Test, 7.15 seconds for Single-Leg Stance Test, and 4.90 centimeters for Functional Reach Test. Minimal important change (MIC) values were 4.5 steps for Step Test, 13.10 seconds for Single-Leg Stance Test, and 5.5 centimeters for Functional Reach Test.
Conclusion: Three tests are reliable, valid and responsive for measuring balance in patients with knee OA. The MIC values aid clinicians and researchers in assessing the clinical relevance of changes in balance for these patients.
Keywords: Reliability, Validity, Responsiveness, Balance, Osteoarthritis

Physiotherapy in Anterior Cruciate Ligament Injury in Dogs

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Introduction: Cruciate ligament injuries are one of the most common conditions in dogs, especially large breeds, and can be very painful and limiting for the animal, and may require surgery and a long recovery period.symptoms of a rupture can include pain, swelling, lameness and instability of the knee, hearing a “click” at times, and inability to bear weight on the injured leg. Most common causes of injury: rapid leg-starts, high jumps, sudden impact, or as a result of wear and tear over time. Active and large dogs are more at risk than others.Several factors contribute to the tear of this ligament in dogs, including

being overweight (over 20-25 kg), age (over six years old), breed (large breeds such as German Shepherds, Labrador Retrievers and Rottweilers are at higher risk for ACL injury than smaller breeds), and constant physical activity (jumping and running).

Materials and Methods: Diagnosis is based on clinical observation and assessment (lameness, weight bearing, joint instability, Lachman or Drawer tests in veterinary medicine). Imaging: Radiography, ultrasound, and MRI if available are used. Surgical procedures used in these cases include correction of the femoral-knee axis with Tibial Plateau Leveling Osteotomy (TPLO), Tibial Tuberosity Advancement (TTA), and Extracapsular Repair for smaller dogs or those with anesthesia limitations. The choice of TPLO/TTA/Extracapsular surgery depends on weight, activity level, age, and the surgical center's equipment. In a physical therapy program that plays an important role in returning to normal life, the role of age is particularly important, with younger dogs usually responding more quickly and intensely to rehabilitation, while older dogs are more sensitive to physical limitations and pain tolerance. Physiotherapy protocol after cruciate ligament surgery Goal: Reduce pain, reduce swelling, restore range of motion, strengthen quadriceps and hamstrings. Frequency: Depending on the recovery phase, usually 2-3 times a week in the early phases, decreasing or increasing at the discretion of the veterinary team. Applied modalities include the use of cold or heat therapy, electrical muscle stimulation (NMES), TENS, weight-bearing and balance threshold exercises, isometric and active, use of TRX balls, uneven surfaces, and balance exercises to improve proprioception. And training the dog owner to perform a physiotherapy exercise program at home Exercise Therapy Phasing: Phase 0: Initial Management and Preparation (Days 0-7) Goal: Reduce pain and swelling, maintain non-weight-bearing range of motion Exercises: Knee PROM: Gentle flexion/extension with hands, 5-10 repetitions, 2-3 sets per day, Passive toe touches, and gentle stretching of lower extremity muscles Tips: Avoid weight-bearing on the leg until approved by veterinarian, use heat or cold as directed

Results: Phase 1: Initial light weight bearing rehabilitation (weeks 1-3) Exercises: Short walks on soft surfaces: 5-10 minutes, 2-3 times per day Active quad isometrics: 10-15 reps, hold 5-6 seconds Hamstring and gastrocnemius isometrics: 10-15 reps Lifting exercises using a headband or harness for support Phase 2: Strengthen Muscles and Improve Stability (Weeks 4-8) Increase muscle strength and proprioception balance Exercises Bodyweight Squats, Step Downs with Small Steps, Light resistance quadriceps strengthening: light resistance bands or light weights, Hamstrings with bands or ball, Balance exercises: Standing on an uneven surface with little support (e.g., on a pillow) Phase 3: Return to normal activity and sports (month 2 onwards) Advanced muscle strengthening exercises with weights or resistance machines such as slow jogging, small jumps, Advanced proprioception exercises, distance running, quick changes of direction.

Conclusion: Days 1-3: 15-20 minutes ROM and Quad isometrics (2 sets) Days 4-7: 20-25 minutes ROM + 2-3 short walks + simple balance exercises Week 2: 25-30 minutes of lower-resistance strengthening exercises + uneven-surface balance exercises Week 4: Increase to 30-40 minutes of resistance training; add steps and jumps.

Keywords: Animal Physiotherapy, Cruciate Ligament

The Effect of High Intensity Interval Training on Mitochondrial Expression of Mir-133 and MiR15 Gene in the Heart Tissue of Rats with Myocardial Infarction

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Introduction: The purpose of this study was to investigate the effect of HIIT on mitochondrial expression of Mir-133 and MiR15 gene in the heart tissue of rats with myocardial infarction
Materials and Methods: 24 male Wistar rats were divided into healthy and illness groups. Then 18 male rats after myocardial infarction with using intraperitoneal injection of isoproterenol randomly divided into HIIT and patient control groups to present study should be performed on three groups. The exercise group was exposed to HIIT for eight weeks. HIIT training was performed for eight weeks with an intensity of 85-90% VO2max for 5 days a week. Relative expression of Mir-133 and MiR15 gene was obtained by real-time PCR. Data were analyzed by one-way ANOVA and Tukey's post hoc test.
Results: The results of one-way ANOVA showed a significant difference between the means of the three groups in the expression of Mir-133 and MiR15 gene in the heart muscle of male rats ($p = 0.001$). The results of post hoc test showed an increase in Mir-133 gene expression and a decrease in MiR15 gene expression in rat heart muscle in the training group compared to the healthy and sick control group ($p = 0.001$).
Conclusion: Given the positive effect of HIIT on positive changes in the amount of genes associated with myocardial infarction, it seems that understanding the cellular and molecular processes affected by exercise can lead to the use of physical activity as a targeted and uncomplicated treatment in the future.
Keywords: HIIT, Expression Gene،Myocardial Infarction

Influence of Forward Head Posture Severity on Postural Stability Limits

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Introduction: Forward head posture (FHP) leads to the anterior excursion of the center of gravity, which can affect a person's standing balance. Evaluating the balance in different degrees of severity of FHP can help design and plan appropriate balance exercises for people with FHP.
Objectives: This study aimed to evaluate the changes in the limits of stability (LOS) in people with mild and moderate-to-severe grades of FHP.
Materials and Methods: The participants in this study were 70 individuals suffering from

FHP, aged between 17 - 45. They were divided into two groups based on their craniovertebral angle: Mild (> 45.5 degrees) and moderate-to-severe (< 45.5 degrees). The LOS test was performed using a posturography device (NeuroCom, Equitest, USA). Five indices—movement reaction time (RCT), movement velocity (MVL), endpoint excursion (EPE), maximum excursion (MXE), and directional control (DCL)—were evaluated. For each LOS variable, we performed a separate 2 × 5 mixed model analysis of variance (ANOVA). The between-group factor was group (mild FHP, moderate-to-severe FHP), and the within-group factors were direction of the LOS (Forward, Backward, Right, Left, and Overall). If there was a significant interaction of group-by-direction of the LOS variables, a comparison between groups was performed using independent-sample t-tests.

Results: Based on the results of the LOS test, RCT, MVL, EPE, MXE, and DCL were significantly different between the mild and moderate-to-severe FHP groups in both anterior and posterior directions ($P < 0.05$). However, in other directions, no significant difference was observed in these variables based on the LOS test ($P > 0.05$).

Conclusion: It can be concluded that individuals with moderate-to-severe FHP are more likely to have postural control deficits. Therefore, it is necessary to design appropriate targeted interventions to prevent falls in these individuals. Specifically, they should receive balance exercises in dynamic situations.

Keywords: Posture, Balance, Severity, Evaluation

Clinical Utility of Balance Assessments During Single- and Dual-Task Conditions in Chronic Ankle Instability and Copers

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Introduction: Previous studies have examined the ability of balance tests to distinguish between individuals with chronic ankle instability (CAI) and healthy controls. Purpose: To investigate accuracy and determine cutoff scores of balance tests in single- and dual-task conditions in discriminating between copers and individuals with CAI.

Materials and Methods: Seventy subjects (35 subjects in each group) participated in the study. Static and dynamic balance were evaluated using single-leg stance, side hop, figure-of-8 hop, and Y-balance test in single- and dual-task conditions. A cognitive task used in the study was backward counting by seven, starting from a random number, between 200 and 300. The accuracy of these tests was determined by calculation of sensitivity, specificity, area under receiver operating characteristic (ROC) curve (AUC), likelihood ratios (LRs) and predictive value (PV).

Results: The ROC curve showed, except for posterior-lateral direction of Y-balance test, all balance tests had good ability for discrimination between two groups of coper and

CAI. Also, the highest sensitivity (0.97 (95% confidence interval (CI): 0.84-0.99)) and the lowest amount of negative LR (0.05 (95% CI: 0.00-0.35)) and negative PV (0.95 (95% CI: 0.73-0.99)) were related to single-leg stance. While the highest specificity (0.82-0.88) and greatest positive LR (5-5.75) and positive PV (0.83-0.85) were related to side hop test, single-leg stance, figure-of-8 hop, and the posterior medial direction of Y-balance test in dual-task condition.

Conclusion: Investigating the static and dynamic balance under dual-task conditions could have added value to correctly identifying balance deficit in individuals with CAI.

Keywords: Balance, Ankle, Dual-Task, Sensitivity, Specificity

Effectiveness of Transcranial Direct Current Stimulation of the Primary Sensory Cortex Combined with Conventional Physiotherapy on Pain Intensity and Clinical Functional Ability of People with Knee Osteoarthritis: "A Clinical Trial"

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Introduction: Osteoarthritis is the most common type of arthritis and joint disease in humans, which is characterized by progressive destruction of articular cartilage. Among the large joints of the body, the knee is the most common site of this disease. This condition is chronic in nature and central and peripheral sensitivity are involved. The aim of this study was to investigate the effect of adding cathodal direct current stimulation (ctDCS) and anodal tDCS (atDCS) of the primary sensory cortex to conventional physiotherapy (PT) on pain and functional ability of people with chronic knee osteoarthritis.

Materials and Methods: 60 people with chronic knee osteoarthritis participated in this study. They were randomly assigned to three treatment groups: PT with ctDCS of the primary sensory cortex (S1), PT with atDCS of the primary sensory cortex, and PT with sham tDCS (Sham). Visual analogue scale (VAS) for pain intensity, Knee Osteoarthritis Outcome Questionnaire (KOOS) and 15-second stair climb, 30-second chair sit-to-stand and 4-time 10-meter walk tests were used to assess functional disability at baseline, session 10, and one and 3 month after the last session.

Results: Compared with sham stimulation and atDCS, ctDCS on S1 improved VAS pain score, KOOS score, and functional tests at session 10, 1, and 3 month after treatment. In addition, atDCS on S1 improved VAS pain score and KOOS score and functional test at session 10 and one month after treatment.

Conclusion: Adding tDCS to conventional physiotherapy treatment can be a complementary treatment for pain relief, disability reduction, and functional improvement in patients with chronic knee osteoarthritis. It seems that primary sensory cortex stimulation in this group of patients had better functional outcomes following pain reduction.

Keywords: Osteoarthritis, Function, Pain, TDCs

AI-Assisted Physiotherapy for Erectile Dysfunction: A Systematic Review

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Introduction: Erectile dysfunction (ED) is a prevalent condition affecting men worldwide, often resulting from vascular, neurological, hormonal, or psychological factors. Conventional treatments such as pharmacotherapy, penile implants, or psychotherapy may be limited by contraindications, side effects, or patient preference. Recently, physiotherapy, especially pelvic floor muscle training (PFMT), enhanced by artificial intelligence (AI), has emerged as a non-invasive alternative. AI applications, including personalized exercise programs, wearable sensors, and digital monitoring, offer potential to optimize therapy outcomes. This review systematically evaluates the current evidence on AI-assisted physiotherapy in men with ED, focusing on efficacy, safety, and clinical applicability.
Materials and Methods: A comprehensive literature search was conducted in PubMed, Scopus, Web of Science, and IEEE Xplore for studies published up to 2025. Inclusion criteria were randomized controlled trials, cohort studies, and case series that assessed AI-assisted physiotherapy interventions for ED. Data extracted included study design, sample size, intervention type (PFMT, electrotherapy, AI-guided exercises), duration, outcome measures (IIEF, SHIM, quality of life), and main findings. Study quality was assessed using the Cochrane Risk of Bias tool for RCTs and Newcastle-Ottawa Scale for observational studies.
Results: Eight studies met the inclusion criteria. Interventions primarily involved PFMT guided by AI platforms or wearable feedback devices, electrostimulation, and mobile applications for remote monitoring and adherence tracking. Most studies reported significant improvements in erectile function (IIEF scores), sexual satisfaction, and patient adherence. AI integration enabled personalized progression of exercises and real-time monitoring. However, studies were limited by small sample sizes, short follow-up periods, and heterogeneity in intervention protocols, preventing meta-analysis.
Conclusion: AI-assisted physiotherapy appears to be a promising non-invasive approach for men with ED, enhancing the efficacy of pelvic floor rehabilitation, adherence, and patient engagement. Despite encouraging preliminary results, larger multicenter trials with standardized protocols and long-term follow-up are needed to validate effectiveness, safety, and cost-efficiency. Integrating AI into physiotherapy may offer a personalized, patient-centered solution for ED management.
Keywords: Erectile Dysfunction, AI Physiotherapy, Pelvic Rehabilitation

Novel Neuroplasticity-Based Therapies for Chronic Musculoskeletal Pain

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Introduction: Musculoskeletal pain is a prevalent condition affecting various joints and soft tissues, frequently leading to chronic pain and functional limitations. While traditional treatments predominantly target structural and biomechanical abnormalities, chronic pain often involves central nervous system alterations. Central sensitization, a heightened excitability of nociceptive neurons in the central nervous system, is a crucial mechanism underlying the development and persistence of chronic musculoskeletal pain.
Materials and Methods: This narrative review synthesizes current knowledge on the pathophysiology of chronic musculoskeletal pain, emphasizing central sensitization's role. It further explores emerging neuroplasticity-based therapeutic interventions such as Mirror Visual Feedback (MVF), Graded Motor Imagery (GMI), and Sensory Discrimination Retraining (SDR). These approaches aim to reverse maladaptive cortical reorganization and restore normal sensory and motor functions.
Results: Central sensitization amplifies pain responses, including allodynia and hyperalgesia, through altered neuronal excitability and cortical re-mapping in brain regions responsible for pain processing, somatosensation, and motor control. Neuroplasticity-focused therapies have shown promise in normalizing these neural changes, thereby reducing pain severity and disability in chronic musculoskeletal conditions.
Conclusion: Chronic musculoskeletal pain is multifactorial, involving both peripheral tissue pathology and central nervous system dysfunction. The presence of central sensitization and associated neuroplastic changes necessitates treatment strategies extending beyond structural correction. Incorporating sensorimotor retraining and neuroplasticity-informed therapies into rehabilitation protocols offers a promising avenue to enhance clinical outcomes, reduce pain chronicity, and improve patients' quality of life. Future research should aim to optimize these innovative therapies and validate their long-term clinical efficacy.
Keywords: Musculoskeletal Pain, Chronic Pain, Central Sensitization, Neuroplasticity, Sensorimotor Retraining

The Role of Physiotherapy in the Management of Infertility

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Introduction: Infertility affects approximately 10-15% of couples worldwide and may result from gynecological, urological, hormonal, or musculoskeletal dysfunctions. Beyond pharmacological and surgical interventions, physiotherapy has been suggested as a supportive treatment to address pelvic floor dysfunction, chronic pelvic pain, adhesions, endometriosis-related symptoms, and lifestyle-related risk factors. Interventions such as pelvic floor muscle training, manual therapy, myofascial release, therapeutic exercise, electrotherapy, and relaxation techniques have been studied with growing interest. This systematic review aimed to evaluate current evidence (up to 2025) on the role of physiotherapy in improving reproductive health and fertility outcomes.
Materials and Methods: A systematic literature search was performed in PubMed, Scopus, Web of Science, and Cochrane Library databases up to December 2025. Eligible studies included randomized controlled trials (RCTs), quasi-experimental trials, and systematic reviews investigating physiotherapy interventions for women or men with infertility or related reproductive dysfunctions. Interventions of interest were pelvic floor rehabilitation, manual therapy (visceral manipulation, myofascial release), exercise therapy, electrotherapy modalities, and behavioral/relaxation programs. Two reviewers independently screened titles and abstracts, extracted data, and assessed methodological quality using PRISMA guidelines. Outcomes included pregnancy rates, reproductive organ function, pelvic pain reduction, sexual function, and quality of life.
Results: A total of 11 clinical studies (6 RCTs, 5 quasi-experimental) involving over 700 participants were included. Evidence suggests that pelvic floor physiotherapy improves pelvic circulation, sexual function, and reduces pain, thereby indirectly supporting fertility. Manual therapy and myofascial release were associated with improved tubal patency and higher spontaneous pregnancy rates in women with unexplained infertility or pelvic adhesions. Exercise programs demonstrated benefits in weight management and hormonal regulation, particularly in women with polycystic ovary syndrome (PCOS). Limited evidence also supports the role of physiotherapy-based stress reduction programs in enhancing natural conception. However, methodological heterogeneity and small sample sizes limit strong conclusions.
Conclusion: Physiotherapy shows promising supportive benefits in infertility management through pelvic floor rehabilitation, manual therapy, exercise, and lifestyle modification. While preliminary results indicate improvements in reproductive outcomes and quality of life, evidence remains limited by small, heterogeneous trials. Larger, high-quality RCTs are required to clarify the effectiveness, standardize treatment protocols, and define the role of physiotherapy as an adjunct to conventional infertility treatments. Integrating physiotherapy into multidisciplinary fertility care may enhance both physical and psychosocial outcomes for couples experiencing infertility.
Keywords: Physiotherapy, Infertility, Pelvic Floor Rehabilitation, Manual Therapy, Reproductive Health

Low-Level Versus High-Level Laser Therapy for Pain, Swelling, and Range of Motion After ACL Surgery: A Randomized Controlled Trial

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Introduction: This study investigated the effects of low-level laser therapy (LLLT) and high-level laser therapy (HLLT), each combined with physical therapy, on knee pain, swelling, and range of motion following anterior cruciate ligament (ACL) reconstruction in male amateur athletes.

Materials and Methods: The study involved 26 male amateur athletes aged 18-35 who had undergone ACL surjery. Participants were randomly assigned to two groups:HLLT+PT (n=14) and LLLT+PT (n=12). Each group received 10 sessions of laser therapy alongside rehabilitation exercises. Outcomes measured included pain intensity via visual analog scale (VAS), active and passive knee range of motion, swelling at different knee points, and pain and quality of life evaluated through the KOOS questionnaire. Statistical analyses were conducted with various tests in SPSS v.25.

Results: Both groups showed significant post-treatment improvements in pain, swelling, symptoms, daily activity performance, and ROM. The HLLT+PT group experienced notable pain reduction ($p=0.007$), decreased swelling ($p<0.001$), symptom relief ($p<0.001$), enhanced daily activities ($p<0.001$), and better range of motion ($p<0.001$). The LLLT+PT group also showed significant gains in these areas ($p<0.05$). When comparing the two groups, only quality of life differed significantly, favoring the LLLT+PT group ($p=0.043$). No significant differences were observed between the two therapies for other measures.

Conclusion: Both low- and high-level laser therapies effectively improved knee pain, swelling, and mobility after ACL surgery in male athletes. Although HLLT showed somewhat greater effects, differences were not statistically significant. Laser therapy appears to be a beneficial adjunct to rehabilitation, but further research with larger samples and advanced measurement tools is necessary to delineate the specific effects of different laser types.

Keywords: Anterior Cruciate Ligament, Laser Therapy

Analyzing the Function, Benefits, and Challenges of Using Artificial Intelligence as a Physiotherapist Assistant from Physiotherapists' Point of View

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Introduction: Nowadays, medical technology plays a significant role in improving health services. Today, Artificial Intelligence (AI) based medical technology provides general practice, prevention, anticipatory, collaborative, and personalized models in order to improve patients' health status. Physiotherapy being one of the main fields of health system takes advantage of the various abilities of AI. AI as the physiotherapist's assistant can be effective in diagnosis, prevention, individualized modeling of every patient's treatment process and controlling it. Therefore, this study is designed and conducted in order to analyze the function, benefits, and challenges of using AI as a physiotherapist assistant from the perspective of Iranian physiotherapists.

Materials and Methods: Firstly, a questionnaire was designed by a research team in the form of open-ended and close-ended questions structured as 47 items to analyze the function, benefits, and challenges of using AI as a physiotherapist's assistant from the perspective of a physiotherapist. After the qualitative approval of expert panel as content validity, the questionnaire was sent electronically, in Porsline.ir setting, throughout the social networks for physiotherapy awareness in the whole country.

Results: The complete findings are presented in the attached file of the manuscript.The overview of the findings revealed that for using AI it is necessary to change the current methods and learn new skills through workshops and virtual courses.AI is applicable to improve diagnostic accuracy and enhancing productivity.Worries were existed about legal responsibilities.In the case of an incorrect diagnosis, the physiotherapist and AI development company should be held responsible.Technological challenges are reliability,privacy,data security,support,and implementation cost.AI recommendations should not be trusted without human supervision. The role clear policies in protecting patient privacy is crucial.AI should interact with the patient through a physiotherapist. Using AI is budget-friendly for therapist and patients. The integration of AI as physiotherapist's assistant with the current professional position of physiotherapy is difficult and challenging.

Conclusion: With the increasing use of AI in modern medicine, its role as a physiotherapist's assistant can be an effective and budget-friendly tool. Benefitting from adequate education, formulating organizational policies, and constant monitoring in terms of updating the content and securing the data can act as a facilitator in this regard. Creating a proper foundation given the ever-increasing progress is very crucial and has to be one of the priority indicators of the health ministry.

Keywords: Physiotherapy, Artificial Intelligence, Assistant, Medical Technology

Preventive Physiotherapy for Digital Device Syndrome: A Systematic Review

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Introduction: The pervasive use of digital devices has led to a significant increase in musculoskeletal disorders, collectively termed Digital Device Syndrome (DDS). Conditions such as "text neck," characterized by neck pain and stiffness due to prolonged forward head posture, have become prevalent, especially among adolescents and young adults. These disorders are associated with poor posture, inadequate ergonomics, and sedentary lifestyles. While pharmacological treatments are commonly employed, there is a growing interest in non-invasive interventions like physiotherapy to prevent and manage DDS. This review aims to evaluate the effectiveness of physiotherapy-based preventive strategies in mitigating DDS.

Materials and Methods: A comprehensive literature search was conducted across electronic databases, including PubMed, Scopus, and Cochrane Library, for studies published up to 2025. Inclusion criteria encompassed randomized controlled trials, cohort studies, and systematic reviews that assessed the impact of physiotherapy interventions—such as posture correction exercises, ergonomic training, and manual therapy—on the prevention of DDS. Data were extracted regarding study design, sample size, intervention protocols, outcome measures, and key findings. The quality of the included studies was assessed using appropriate tools, such as the Cochrane Risk of Bias Tool for randomized trials.

Results: A total of 8 studies met the inclusion criteria. Interventions commonly involved posture correction exercises, ergonomic education, and manual therapy techniques. Outcome measures included pain intensity, range of motion, and functional disability assessments. The majority of studies reported significant improvements in these outcomes following physiotherapy interventions. However, variations in intervention protocols and outcome measures limited the ability to draw definitive conclusions.

Conclusion: Physiotherapy-based preventive strategies appear to be effective in reducing the incidence and severity of DDS. Implementing posture correction exercises, ergonomic training, and manual therapy can significantly alleviate symptoms and improve functional outcomes. Given the increasing prevalence of DDS, integrating physiotherapy into preventive healthcare routines is recommended. Future research should focus on standardizing intervention protocols and conducting long-term studies to validate these findings.

Keywords: Digital Device Syndrome, Text Neck, Posture Correction, Ergonomics, Preventive Healthcare

Application of Mobile Health in Promoting Awareness and Educating Informal Caregivers of the Older Adult on Physical Self-Care: A Literature Review Study

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Introduction: Currently, due to the lack of formal care services for the older adult, the majority of the care burden falls on informal caregivers, who are exposed to psychological and physical harm due to the stress of long-term care. Various studies have shown that targeted education and awareness raising for caregivers increases the health level of these individuals directly and the elderly under their care indirectly. Considering the capacities of mobile health platforms in providing health services, one of the desirable ways to educate and raise awareness for older adult caregivers is mobile health platforms. The aim of this study is to review the existing literature on the use of mobile health in promoting awareness and educating informal caregivers about physical self-care
Materials and Methods: In this study, a review of PubMed , Google Scholar , and Web of Science databases was conducted. Irandoc, SID , was used to search for existing texts. The English keywords : Digital health application, Education, Health aging, informal care giver, mHealth , older people and Persian keywords: آموزش, سلامت همراه, مراقبین غیررسمی, سالمند, were used for the study. After filtering the years 2020 to 2025, 121 articles were found, of which 12 articles met the inclusion criteria
Results: Most studies emphasized the need and use of telephone and online training for caregivers, and studies on mobile applications show that the use of these programs, in addition to being easy and inexpensive to access, increases participation and positively changes the quality of life of caregivers and the quality of life of the older adult under care.
Conclusion: The study showed that the use of mobile applications to educate caregivers to reduce the burden of care giving and improve the quality of life of caregivers has been neglected, and these platforms should be designed based on scientific evidence and the needs of their audience to increase their effectiveness in educating and raising awareness among caregivers of the older adult. Also, to achieve healthy aging, maintaining and increasing the health of caregivers is as important as the health of the older adult.
Keywords: Digital Health, Older Person, Caregiver

Exploring the Promising Impact of Pulmonary Rehabilitation on Gait and Balance in Patients With COPD A Systematic Review and Meta-Analysis

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Introduction: Chronic obstructive pulmonary disease (COPD) is commonly associated with respiratory difficulties, but it also presents with musculoskeletal problems. The objective of this systematic review and meta-analysis was to evaluate the effects of pulmonary rehabilitation (PR) on balance and gait in patients with COPD.

Materials and Methods: We conducted a comprehensive search of 4 databases, including PubMed, Google Scholar, Science Direct, and Web of Science, from inception to November 2023. The review included studies reporting the association between COPD status and balance and gait using PR. Two independent reviewers examined the titles and abstracts, extracted the data using a standardized form, and assessed the risk of bias of the included articles.

Results: A total of 14 studies with 320 patients in the study groups and 188 controls were included in the analysis. The risk of bias in the included studies was medium to high. The results showed that PR non-statistically significantly improved balance, as demonstrated by moderate effect sizes in the Timed Up and Go (standardized mean difference [SMD] = 0.1: 95% CI, −1.41 to 1.69) and Berg Balance Scale (SMD = −0.39: 95% CI, −1.30 to 0.53). However, the impact of PR on gait function was less clear, with mixed results. The study findings highlight the positive but non-significant effects of PR on balance in individuals with COPD.

Conclusion: The results suggest that PR programs could include exercises that target balance improvement to enhance the overall quality of patients. However, further research is needed to determine the optimal duration and intensity of these exercises to achieve maximum benefits for patients with COPD.

Keywords: COPD, Balance, Gait

Artificial Intelligence as a Physiotherapy Assistant: A Systematic Review of Applications, Efficacy, and Future Directions

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Introduction: The integration of Artificial Intelligence (AI) into physiotherapy has emerged as a transformative approach to enhance patient care, optimize treatment outcomes, and address challenges such as clinician workload and accessibility. AI technologies, including machine learning algorithms, wearable sensors, and virtual assistants, are being employed to assist physiotherapists in various aspects of clinical practice. This review aims to systematically evaluate the current applications of AI in physiotherapy, assess their effectiveness, and identify potential barriers to implementation.

Materials and Methods: A comprehensive literature search was conducted across multiple electronic databases, including PubMed, Scopus, Web of Science, and IEEE Xplore, to identify studies published up to 2025 that investigated the use of AI in physiotherapy. Inclusion criteria encompassed randomized controlled trials, cohort studies, and systematic reviews that evaluated AI-assisted interventions in physiotherapy settings. Data were extracted regarding study design, AI technologies utilized, patient populations, outcomes measured, and key findings. The quality of the included studies was assessed using appropriate tools, such as the Cochrane Risk of Bias Tool for randomized trials and the Newcastle-Ottawa Scale for observational studies.

Results: A total of 42 studies met the inclusion criteria, comprising18 randomized controlled trials,12 cohort studies and12 systematic reviews. AI applications in physiotherapy were categorized into several domains: Diagnostic Assistance:AI algorithms demonstrated high accuracy in analyzing medical imaging and sensor data to assist in diagnosing musculoskeletal and neurological conditions. Treatment Personalization:Machine learning models were utilized to develop individualized rehabilitation plans based on patient data,leading to improved outcomes in various patient populations. Remote Monitoring and Telerehabilitation:AI-powered platforms enabled continuous monitoring of patient progress through wearable devices and virtual consultations, facilitating remote rehabilitation and early detection of complications. Clinical Decision Support:AI systems provided physiotherapists with evidence-based recommendations for treatment strategies, enhancing clinical decision-making processes.

Conclusion: AI has the potential to revolutionize physiotherapy by providing tools that enhance diagnostic accuracy, personalize treatment plans, and facilitate remote patient management. Despite promising results, challenges such as data privacy concerns, integration with existing healthcare systems, and the need for clinician training must be addressed to fully realize the benefits of AI in physiotherapy. Future research should focus on large-scale, multicenter trials to validate AI applications, standardize outcome measures, and explore the long-term impact of AI-assisted interventions on patient health outcomes and healthcare costs.

Keywords: Artificial Intelligence, Telerehabilitation, Rehabilitation Robotics

Work-Related Low Back Pain in Physical Therapists: A Systematic Review and Evidence-Based Synthesis

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Introduction: Physical therapists work in unique occupational settings, and due to the physical demands of their profession, they may experience a higher prevalence of work-related lower back pain. This systematic review aims to investigate the rate of low back pain as a work-related disorder among these healthcare professionals.
Materials and Methods: A comprehensive literature search was conducted across the Medline via PubMed, Scopus, Cochrane library, and Web of Science databases to identify observational studies reporting the prevalence of low back pain in physical therapists. The search strategy utilized the following subject headings: "Physiotherapist" OR "Physical Therapist" AND "Low Back Pain." The eligibility of studies was screened first by title and abstract, followed by full-text review. Quality assessment and data extraction were performed by two independent reviewers. Critical appraisal of the included records was conducted using the Joanna Briggs Institute (JBI) checklist for prevalence studies.
Results: The initial database search identified 21,727 potentially relevant records (PubMed = 1,697; Scopus = 13,260; Cochrane Library = 540; Web of Science = 6,230). Following the application of inclusion criteria, 18 studies were selected that provided pertinent data on the prevalence of low back pain among physical therapists. Reported prevalence rates ranged from 41% to 50%. These studies revealed considerable variability in the contributing factors to work-related low back pain. Commonly cited risk factors included forward bending or twisting motions, lifting or assisting patients, maintaining static postures for prolonged periods, performing repetitive tasks, working in confined or awkward spaces, applying manual therapy techniques, encountering sudden patient movements or falls, handling or transporting heavy equipment, and working while physically fatigued or injured. The prevalence of these factors varied widely, ranging from 3% to 88%.
Conclusion: The results of this systematic review highlight that work-related low back pain is a common issue among physical therapists. Further studies are necessary to examine how this condition affects job performance and the quality of care provided to patients.
Keywords: Physiotherapist, PhysicalTherapist, Low Back Pain

Applying Artificial Intelligence and Mobile Applications in Physiotherapy and Improving Healthcare Systems

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Introduction: The rise of digital technologies and artificial intelligence (AI) has transformed physiotherapy through telephysiotherapy, enhancing access to services and redefining healthcare delivery. This study investigates the strategic role of mobile health applications in addressing key challenges, including limited access to specialized services in remote or underserved regions, inefficient patient referrals, cost reduction, and sustained treatment monitoring. In this study, we introduce the Physiopars app as a locally developed product in this field, highlighting its practical implementation and regulatory compliance, offering insights into its global relevance.
Materials and Methods: This research adopts a systematic review and analytical methodology with scoping elements. We conducted a comprehensive search of scientific databases (e.g., PubMed, Scopus, and Web of Science) and authoritative documents on digital health and telerehabilitation. Search terms included "tele physiotherapy," "telerehabilitation," "artificial intelligence in physiotherapy," and "mobile health applications." Inclusion criteria focused on peer-reviewed studies from 2020-2025 addressing AI-driven rehabilitation tools and their clinical outcomes. Simultaneously with the formation and growth process of Physiopars, similar apps from other countries were examined, including MedBridge from the USA, Physitrack from Australia, and SimpleSet from Canada, to provide a comparative perspective on global standards and innovations in physiotherapy software. Additionally, we analyzed the operational experience of Physiopars, including its development process, acquisition of national licenses from Iran's Food and Drug Administration, and adherence to legal and ethical standards, as tangible evidence of its feasibility and efficacy, positioning Physiopars as a local reference for such platforms.
Results: Results from the systematic review indicate that validated telerehabilitation apps significantly improve access to services by offering precise assessments, remote monitoring, and AI-driven personalized exercise programs that adapt progressively to patient needs. Features like direct clinician-patient communication further enhance interactivity. Integrating AI amplifies these benefits, enabling predictive analytics for injury prevention and immersive VR/AR experiences for engagement. This leads to higher adherence rates, addressing issues where traditional adherence can drop to as low as 35%. A major concern, however, is the unregulated proliferation of substandard apps developed illegally by unqualified individuals and organizations in the digital space.
Conclusion: Adopting locally developed, certified telephysiotherapy apps is not merely supplementary but imperative for advancing quality, equity, and efficiency in Iran's healthcare system. Innovations like Physiopars serve as models for future developments, underscoring the pivotal role of AI and digital tools in evolving physiotherapy and bolstering the profession's future.
Keywords: Telephysiotherapy, Artificial Intelligence, Mobile Applications

The Effect of Physiotherapy on Erectile Dysfunction in Men

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Introduction: Erectile dysfunction (ED) is a prevalent condition affecting a significant proportion of men worldwide, with various etiologies including vascular, neurological, hormonal, and psychological factors. Traditional treatments such as pharmacotherapy, penile implants, and psychotherapy have been widely used; however, they may not be suitable for all patients due to contraindications, side effects, or personal preferences. Physiotherapy, particularly pelvic floor muscle training (PFMT), has emerged as a non-invasive alternative treatment modality. This systematic review aims to evaluate the efficacy of physiotherapy interventions in the management of ED in men, focusing on outcomes such as erectile function, sexual satisfaction, and quality of life.

Materials and Methods: A comprehensive literature search was conducted across multiple electronic databases, including PubMed, Scopus, Web of Science, and Cochrane Library, to identify studies published up to 2025 that investigated the effects of physiotherapy on ED in men. Inclusion criteria encompassed randomized controlled trials (RCTs), cohort studies, and systematic reviews that assessed physiotherapy interventions such as PFMT, electrotherapy, manual therapy, and lifestyle modifications. Data were extracted regarding study design, sample size, intervention protocols, outcome measures, and key findings. The quality of the included studies was assessed using the Cochrane Risk of Bias Tool for RCTs and the Newcastle-Ottawa Scale for cohort studies.

Results: A total of 42 studies met the inclusion criteria, comprising 18 RCTs, 12 cohort studies, and 12 systematic reviews. The majority of studies focused on PFMT, with various protocols involving different frequencies, durations, and intensities. Electrotherapy modalities, including transcutaneous electrical nerve stimulation (TENS) and functional electrical stimulation (FES), were also commonly investigated. Manual therapy approaches, such as myofascial release and trigger point therapy, were less frequently studied but showed promising results. Outcome measures varied across studies but commonly included the International Index of Erectile Function (IIEF), Sexual Health Inventory for Men (SHIM), and quality of life assessments. Overall, physiotherapy interventions were associated with significant improvements in erectile function, sexual satisfaction, and quality of life. However, heterogeneity in study designs and outcome measures limited the ability to draw definitive conclusions.

Conclusion: Physiotherapy interventions, particularly PFMT, electrotherapy, and manual therapy, have shown potential in improving erectile function and quality of life in men with ED. These non-invasive treatments may serve as effective alternatives or adjuncts to traditional therapies, especially for patients who are contraindicated for pharmacological treatments or prefer non-pharmacological options. However, the variability in intervention protocols and outcome measures highlights the need for standardized guidelines and further high-quality, multicenter RCTs to establish optimal treatment protocols and long-term efficacy. Future research should also explore the mechanisms underlying the

effects of physiotherapy on ED and identify patient populations that may benefit most from these interventions.

Keywords: Erectile Dysfunction, Physiotherapy, Pelvic Floor Muscle Training, Electrotherapy, Manual Therapy

The Hip Joint Mobilization with Movement Technique Improves Muscle Activity in Hemiplegia Secondary to Chronic Stroke

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Introduction: People with stroke generally experience abnormal muscle activity and develop balance disorder. Based on the important role of the proximal muscles and joints of the lower extremity in making balance, the present study aimed to investigate the effectiveness of hip mobilization by performing movement technique (HMWMT) on stroke patients' muscle activity.
Materials and Methods: Twenty patients aged between 35 and 65 years old with chronic stroke were randomly assigned either to an experimental group (EG) (n=10) or to a control group (CG) (n=10). Both groups participated in a 30-minute conventional physiotherapy session 3 times per week for 4 weeks. The EG received an additional HMWMT on the affected side. The electromyography activity of the lower leg and trunk muscles, were measured before, and by passing one day and two weeks from the end of the treatment sessions
Results: The RF, TA, and ES muscles' activations of the affected side markedly changed along with the MG, and RA muscles after HMWM. The mean onset time of RA, ES, RF, and ES muscles activity significantly decreased in the affected side after HMWM compared to the CG.
Conclusion: The results of the present study suggest that a combination of HMWMT and conventional physiotherapy could improve muscle activity among chronic stroke patients.
Keywords: Stroke, Hip, Mobilization with Movement

Transcranial Pulsed Current Stimulation Improves Motor Learning and Brain Activity in a Healthy Older Adult: Behavioral and Electroencephalography Evidence: a Case Report

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Introduction: Aging is linked to declines in motor function and cortical activity, affecting daily living and quality of life. Transcranial pulsed current stimulation (tPCS) may enhance neuroplasticity and motor learning in older adults. This case report examines the effects of tPCS on motor learning and cortical activity in a healthy older adult using behavioral and EEG measures.
Case Presentation: A 64-year-old right-handed Iranian woman (MMSE: 24; (borderline but without functional impairment)) received five daily sessions of anodal tPCS (2 mA, 6-10 Hz, 20 min) over the left primary motor cortex (M1). This frequency range was selected to align with theta-alpha rhythms, which are known to be involved in motor learning. Motor learning was assessed using the Color Matching Test (CMT), a serial reaction time task, with reaction time and errors measured pre-intervention, immediately postintervention, and at two-week follow-up. Concurrent EEG was recorded during task performance.
Results: Analyses focused on absolute and relative power, magnitude square coherence (MSC), and imaginary coherence (iCoh) in theta (4-8 Hz), alpha (8-13 Hz), and beta (13-30 Hz) bands.
Conclusion: Reaction times became faster. Errors were no longer present. These improvements lasted partly after two weeks. EEG showed higher alpha and theta power after stimulation. Coherence between brain hemispheres increased. Changes were most clear in front and central areas. Parietal regions also showed effects. By follow-up, brain activity returned close to baseline. These parameters were selected due to their suitability for assessing the power of each rhythm, local oscillatory activity, and interhemispheric connectivity between the two hemispheres. In a healthy older adult, a brief tPCS course was associated with transient improvements in motor performance and enhanced cortical connectivity, likely through modulation of alpha and theta oscillations. These results suggest that tPCS may hold promise, but further controlled studies are required before clinical application.
Keywords: Aging, Brain Connectivity, Learning, tPCS

Exploring Aspects of Chronic Pain in relation with Mental Disorders and Risk of Falling

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Introduction: The relationship between chronic pain and mental health is complex, particularly affecting individuals with severe mental illness (SMI), with 25-40% experiencing chronic pain. This pain can lead to impaired balance, reduced mobility, and muscle weakness, increasing the risk of falls. Older adults with chronic pain are 53% more likely to fall compared to those without pain, yet there are few targeted pain management interventions for this group. Healthcare for SMI patients is often complicated by diagnostic overshadowing, where physical symptoms are misattributed to mental health issues, resulting in frequent falls and higher morbidity and mortality rates. Most fall-related research focuses on elderly patients in medical settings, but psychiatric patients may also face elevated fall risks due to similar medications and comorbidities. This study aims to investigate the connection between chronic pain and falls among individuals with mental illnesses.
Materials and Methods: A search was conducted on PubMed, Embase, and Google Scholar to find relevant studies, resulting in the inclusion of 12 studies in this article.
Results: Patients with severe mental illness (SMI) have higher rates of chronic pain treatments and physiotherapy referrals. Fall risk factors are categorized as intrinsic (e.g., dementia, previous falls, comorbidities, acute mental states, and psychotic symptoms) and extrinsic (e.g., psychotropic medications, environmental factors). Increased fall risk is linked to diagnoses like bipolar disorder, male gender, older age, and postural instability, especially in schizophrenia. Involuntarily hospitalized patients and those with longer stays are at greater risk of falls. Research indicates that falls related to musculoskeletal pain are prevalent in this population, highlighting the need for targeted screening and preventive measures.
Conclusion: In conclusion, to reduce the risk of falls in psychiatric patients, chronic musculoskeletal pain should also be considered and addressed by physiotherapists .Psychiatric patients with SMI and chronic pain receive significantly more referrals to pain management services and physiotherapy than others. Falls among psychiatric patients carry multiple inherent risks and can lead to serious injuries. Unique factors tied to psychiatric care deserve closer examination, but research on this issue is still sparse. Considering the critical nature of falls and their consequences for residential treatment, there is a pressing need for specialized fall prevention physiotherapy programs to mitigate these risks.
Keywords: Physiotherapy, Psychiatry, Musculoskeletal, Pain, Falling

The Effect of Physiotherapy Interventions on Improving Balance Ability to Prevent Falls in the Elderly: A Literature Review

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Introduction: Falls and fall-related injuries are common in community-dwelling older people and increase exponentially with age. Although the benefits of exercise for fall prevention have been demonstrated, the majority of the elderly are physically inactive due to several physical and mental limitations they may face. Effective multi-factorial fall prevention programs in the primary care setting may be a promising approach to reduce the incidence rate of falls. This literature review conducted aimed to evaluate the effects of physical therapy interventions and exercise on static and dynamic balance in the elderly population to improve their independence in functional activities and quality of life.
Materials and Methods: This literature review was conducted based on PRISMA guidelines using PubMed-Medline, Cochrane Central, Google Scholar and PEDro databases to select randomized clinical trials that analyzed the role of physical therapy interventions and exercise on balance and fall rate in patients aged 65 or older. Trials published from 2015 to september 2025 using the MeSH terms of (balance) AND (Physiotherapy OR rehabilitation) AND (elderly OR aged) were selected. The inclusion criteria were clinical trials that has been published in English and has investigated the effectiveness of different forms of rehabilitation interventions on balance improvement in elderlies. Editorials, letters, and clinical guidelines, as well as duplicate studies were excluded. Quality assessment was performed using PEDro scale, by three independent reviewers.
Results: Out of 118 records were included in the criteria for randomized clinical trials, 48 trials were selected by excluding items common to Parkinson, stroke, MS, COPD, cancer patients undergoing chemotherapy, hospital discharge, and hemiparetic patients.Effective rehabilitation interventions are exoskeletal human body posturizer, neurofeedback training, whole body viberation and Baduanjin exercise training can improve balance through focusing on core stability. Safe step digital exercise, nine square step exercise, vestibular rehabilitation and otago exercise program are dynamic balance exercises with emphasis on functional walking capacity. Aquatic exercise, tai chi and lyengar yoga intervention effects on improving confidence and mentality in patients to decline the risk of imbalance.
Conclusion: This literature review proved that rehabilitation and exercise therapy are effective interventions to improve static and dynamic balance and reduce the number of falls and fallers for patients aged 65 or over. An exercise-based fall prevention program seems that significantly reduce the number of falls per individual, the number of fallers and the incidence rate of fall-related injuries in community-dwelling older people with high risk of falls. This is especially important since older people, especially postmenopausal women, are prone to osteoporosis and have a high risk of fractures after falling. However, further large-scale trials with longer follow-up are needed to estimate the long-term

effects of balance programs on decreasing the rate of falls. Moreover, more studies involving aquatic exercise or comparing aquatic versus land-based programs are necessary to promote innovative strategies to prevent falls in older people, which can be delivered by exercise trainers.

Keywords: Balance, Physiotherapy, Rehabilitation, Elderly

A Comparative Randomized Clinical Trial of Stretching and Strengthening Exercises for Hamstring Flexibility in Patients with Low Back Pain

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Introduction: People with tight hamstring muscles frequently experience low back pain (LBP). It is hypothesized that shortened hamstrings may disrupt the biomechanics of the pelvis and lumbar spine, potentially contributing to the development of back pain. Despite the availability of various therapeutic approaches to manage this condition, their effectiveness remains a topic of debate. This randomized clinical trial aimed to investigate the effects of a four-week intervention that included either stretching or strengthening exercises on hamstring flexibility in patients with LBP.

Materials and Methods: A single-blind randomized controlled clinical trial design with parallel groups was conducted at a university clinic in Kermanshah, Iran. Forty-five patients (31 men and 14 women; mean age, 38.80 ± 11.14 years) suffering from LBP were randomly allocated into three groups (n = 15 each): The Stretching, Strengthening, and Control Group. The Stretching and Strengthening Group participated in a supervised four-week program that included three sessions per week. The primary outcome, hamstring length, was assessed using the Active Knee Extension (AKE) test at both baseline and post-intervention by an experienced physiotherapist.Statistical analyses, including paired t-tests and analysis of covariance (ANCOVA), were conducted to identify significant differences within and between groups, respectively.

Results: The pre-intervention means (SD) for the AKE angle in the Stretching, Strengthening, and Control Groups were 156.2 (9.21), 157.2 (8.29), and 157.8 (5.89), respectively. Following the intervention, the post-intervention means (SD) of the AKE angle in the Stretching, Strengthening, and Control Groups were 164.67 (6.07), 164.07 (5.62), and 163.08 (6.60), respectively. After adjusting for potential confounders, between-group analyses showed no significant differences in hamstring flexibility improvement after four weeks (all P values > 0.05). However, in both intervention groups, significant changes in the AKE angle compared to baseline values were observed (within-group changes were significant; Stretching Group: mean difference (95% CI) = 8.47 (4.05 to 12.87), P value =

0.001; Strengthening Group: mean difference (95% CI) = 6.78 (1.07 to 12.49), P value = 0.023).

Conclusion: In conclusion, a four-week program involving either specific stretching or strengthening exercises has shown that both interventions are effective in improving hamstring flexibility in patients with LBP. The findings indicate that neither approach is superior to the other; thus, the choice between these therapeutic strategies should be based on the individual needs of each patient and the specific treatment goals.

Keywords: Low Back Pain, Hamstring Tightness, Active Knee Extension, Stretching, Strengthening

The Prevalence of Musculoskeletal Disorders in Iran: An Ecological Study

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Introduction: Musculoskeletal disorders, as a significant global health and economic challenge, have a considerable impact on the physical and mental health and quality of life of those affected. Therefore, the present ecological study was conducted to examine the prevalence of various musculoskeletal disorders both globally and specifically in Iran.

Materials and Methods: This descriptive ecological study utilized secondary data. Prevalence data for musculoskeletal disorders across 204 countries were sourced from the Global Burden of Disease data for 2019 (http://ghdx.healthdata.org/gbd-results-tool). According to the Global Burden of Disease estimates, musculoskeletal disorders include a combination of five disorders: rheumatoid arthritis, osteoarthritis, low back pain, neck pain, and gout, classified based on ICD-10 and ICD-9 codes.

Results: Globally, the total number of musculoskeletal disorder cases reached 322,749,424, while in Iran, it was 4,385,723.07. The age-standardized incidence rate (ASIR) ratio of males to females worldwide was 0.77, indicating a higher prevalence among women. Specifically, women accounted for 181,986,332 cases globally compared to 140,763,091 cases in men. This trend was also observed in Iran, where women had 1,064,950 cases and men had 736,153. In terms of specific conditions, low back pain had the highest global incidence (223,455,640.80 cases), followed by neck pain (47,528,964.54 cases) and osteoarthritis (41,467,541 cases). The lowest incidences were seen in rheumatoid arthritis (1,074,390.80 cases) and gout (9,222,886.78 cases). Similarly, in Iran, the most common conditions were low back pain (3,050,709.48 cases), neck pain (865,873.46 cases), and osteoarthritis (15,365.80 cases), while the least common were rheumatoid arthritis (4,684.21 cases) and gout (78,473.73 cases).

Conclusion: The findings of this study indicate a high prevalence of various musculoskel-

etal disorders, particularly low back pain, which is a leading cause of disability in Iran. Therefore, the results of this research should be considered by health managers to devise and implement necessary measures aimed at reducing the burden of musculoskeletal disorders, especially low back pain.

Keywords: Musculoskeletal Disorders, Low Back Pain, Prevalence

Comparison of Static Dry Cupping and Cupping with Active Movements on Pain, Lumbar Mobility, and Function in Athletes with Chronic Nonspecific Low Back Pain: A Randomized Controlled Trial

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Introduction: In this randomized double-blind clinical trial, 24 male and female athletes with nonspecific chronic low back pain were randomly assigned into two groups (static cupping therapy and cupping therapy combined with active movements) and underwent five treatment sessions. Assessments of pain intensity, spinal range of motion, functional mobility, physical performance, and overall perception of treatment effect were conducted at four time points (before the intervention, the first session, the fifth session, and the follow-up period). The Kolmogorov-Smirnov test was used to examine the normality of data distribution. To compare the mean values between the two independent groups at each stage, the independent t-test was employed. The effects of time, group, and their interaction were also evaluated using repeated measures ANOVA. Finally, Cohen's effect size test was applied to examine the magnitude of differences.

Materials and Methods: A double-blind randomized clinical trial was conducted with 24 male and female athletes diagnosed with CNSLBP. Participants were randomly allocated to either static cupping or cupping with active movements and completed five treatment sessions. Outcomes assessed included pain intensity, spinal range of motion, balance, functional disability, and global perceived effect, measured at baseline, after the first session, post-intervention, and at follow-up. Data distribution was evaluated with the Kolmogorov-Smirnov test. Independent t-tests compared groups, and repeated-measures ANOVA assessed time, group, and interaction effects. Cohen's d was used to calculate effect sizes.

Results: Both static cupping and cupping with active movements significantly improved pain, spinal range, performance, and mobility ($p<0.05$). Pain intensity (VAS) decreased more in the active group (d=-2.63 vs. -1.59). Lumbar flexion gains were greater in the

active group (d=0.70 vs. 0.39). Athletes' Disability Index reduced by 52.7% (active) and 57.8% (static). For global perceived effect, 75% of the active group reported "marked to complete improvement" at follow-up vs. 66.7% in the static group. No group differences were seen in lumbar extension, Schober, or hop tests, though both improved ($p<0.05$). Interaction analysis showed faster, sustained improvements in pain and flexion for the active group.

Conclusion: Static and active cupping therapies are effective in reducing pain and enhancing function in athletes with CNSLBP. The addition of active movements to cupping yields superior improvements in specific mobility and disability outcomes, highlighting its potential as a valuable strategy in sports rehabilitation programs.

Keywords: Cupping-Therapy, Active-Movement, Chronic-Non-Specific-Low-Back-Pain

Assessment of Awareness and Attitudes of Faculty Members, Students, and Graduates of Physiotherapy Toward Codes of Ethics and the Physiotherapy Oath at the Undergraduate Level

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Introduction: The medical oath is one of the most fundamental ethical traditions in health professions, shaping professional behavior and attitudes of graduates. Administered at graduation in many countries, it influences how practitioners interact with patients, colleagues, and healthcare systems. Recent studies suggest that while oaths introduce ethical principles and human values early in training, classical versions such as the Hippocratic Oath may not fully align with contemporary realities. This study examined awareness, attitudes, and feasibility of implementing physiotherapy-specific oaths and codes of ethics, and explored challenges of teaching professional behavior from the perspectives of faculty, students, and graduates.

Materials and Methods: Drawing on authoritative literature, four tailored codes of conduct were developed for undergraduate physiotherapy students, corresponding to each academic year. These codes emphasized spirituality in health, ethics in physiotherapy, professionalism, and physiotherapy etiquette, alongside the feasibility of integrating a related educational module. Building on these frameworks, a researcher-designed questionnaire was constructed, consisting of five domains addressing the three main indices of the study: awareness, attitudes, and feasibility of curriculum implementation. The instrument underwent validation and reliability testing. The final version was distributed via Google Forms to physiotherapists across the country, targeting faculty members, undergraduate students, and graduates. Participation was voluntary and responses were anonymized. Data were extracted and analyzed statistically. Descriptive statistics were used to calculate means and standard deviations, while ANOVA tested group differences across occupations. Pearson correlations examined relationships among the three indices. Reliability was assessed with Cronbach's alpha, and functional validity was confirmed.

Results: Fifty-two participants completed the survey (faculty 19.2%, students 26.9%, grad-

uates 53.8%). Mean scores (±SD) indicated relatively high baselines: awareness 4.64±0.39, attitude 3.93±0.60, and feasibility 4.06±0.63. Faculty ranked highest in all dimensions (awareness 4.80±0.25; attitude 4.24±0.66; feasibility 4.33±0.50). Students scored 4.56±0.41, 3.77±0.57, and 4.12±0.61, while graduates reported 4.62±0.43, 3.90±0.59, and 3.93±0.69, respectively. ANOVA revealed no significant differences across groups ($p>0.05$). Correlations were positive and significant: awareness-feasibility $r=0.61$, awareness-attitude $r=0.56$, attitude-feasibility $r=0.51$. Reliability was high (α: awareness=0.95, attitude=0.88, feasibility=0.91).

Conclusion: Findings show that physiotherapy faculty, students, and graduates hold relatively high levels of awareness, positive attitudes, and confidence in feasibility toward codes of ethics and the professional oath. Although occupational differences were not significant, strong correlations among indices highlight that increasing awareness can foster favorable attitudes and support implementation. Embedding structured ethical education, including a mandatory oath-based module with attitude-enhancing interventions, is a feasible and low-risk strategy. Monitoring outcomes with clear KPIs will ensure sustainable impact, aligning physiotherapy training with modern ethical and professional demands.

Keywords: Ethical Codes, Professionalism, Awareness, Attitudes

Comparative Analysis of High-Power Laser Therapy With and Without 1064 nm Wavelength in Spinal Discopathy Treatment

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Introduction: High-power laser therapy is a well-established modality for reducing pain and improving functional abilities in patients. This study evaluates and compares the effectiveness of high-power laser therapy with and without the addition of a 1064 nm wavelength in treating spinal discopathy.

Materials and Methods: Two groups of patients were included in the study following one week of partial rest and pharmacological therapy as prescribed by their respective specialists. Both groups underwent physiotherapy with high-power laser therapy using a gallium arsenide device with an average power output of 5-6 W/cm². The first group received laser therapy with wavelengths of 650 nm, 810 nm, and 910 nm, while the second group received an additional 1064 nm wavelength during treatment.

Results: Both groups demonstrated significant pain reduction and improved physical ability. However, the group treated with the additional 1064 nm wavelength experienced greater pain relief, faster recovery of physical ability, and required fewer treatment sessions compared to the other group.

Conclusion: The findings suggest that the inclusion of the 1064 nm wavelength enhances treatment outcomes by accelerating pain relief and functional recovery. These findings highlight the potential of the 1064 nm wavelength to optimize treatment efficiency and reduce the overall therapy duration.

Keywords: Discopathy, High-Power Laser, 1064 nm

The Effect of High-Power Laser Therapy in Spine Surgery

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Introduction: Since the effect of laser therapy has been proven in nerve regeneration, this study aimed to evaluate the effect of high-power laser therapy in patients with peripheral nerve injuries resulting from various spinal surgeries.
Materials and Methods: This case study includes four patients with conditions such as cauda equina syndrome, lumbar spine fracture, cervical discopathy with myelopathy, and delayed surgery for lumbar canal stenosis, all presenting with symptoms like balance difficulties and paresis. All patients were referred to a physical therapy center four weeks after surgery. In addition to routine practices, such as exercise therapy and I.D.C. electrical stimulation, FDA-approved pulsed gallium arsenide laser therapy was administered. This therapy used wavelengths of 650 and 910 nm, a frequency of 5 to 14 kHz, and an average power of 0.5 to 1 watt per square centimeter (10-15 J/cm²). The first ten sessions were conducted with one-day intervals, followed by twice-weekly sessions for the next ten sessions, and once-weekly sessions for the final ten sessions.
Results: It appears that using high-power laser therapy with adequate dosage in patients with peripheral nerve injuries following spinal surgery not only reduces recovery time but also decreases the number of treatment sessions and may lessen complications.
Conclusion: Further application of this laser therapy in a larger patient population is recommended to validate the approach with greater certainty.
Keywords: High-Power Laser, Spine, Surgery

Exploring Task Complexity in Visual Working Memory: A Thorough Exploration of the Factors that Influence Performance

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Introduction: Spatial working memory (SWM) is a cognitive function that allows individuals to retain and manipulate visual information over short periods of time. Unlike our rich phenomenological visual experience, our short-term visual memory system can only retain representations of three to four objects at a time. Recent studies suggest that the quantity and spatial distribution of stimuli can have a significant impact on task difficulty and task accuracy. We aim to provide a more comprehensive understanding of the complexity of tasks with implications for adaptive cognitive training.
Materials and Methods: We used a computer-based visual pattern memory paradigm with 34 participants (age range 22-45). The task needed subjects to recall the positions

of target stimuli interspersed with non-target stimuli on a hexagonal grid. Two variables were manipulated, the quantity of target stimuli and their spatial distribution (dense vs. distributed patterns). Eye movements were controlled to ensure visual scanning strategies did not confound performance. Generalized linear models were used to analyze performance, with independent variables including the number of target and non-target stimuli, spatial relationships between stimuli, distance from the center of the display, and subject selection strategies.

Results: The analysis showed that performance was significantly affected by the number and spatial arrangement of non-target stimuli. Dense stimulus patterns led to higher recall accuracy than distributed patterns, suggesting chunking strategies to improve memory performance additionally, participants demonstrated a tendency to view stimuli on the left side of the screen, and spatial distribution of targets modulated this bias. The distance of stimuli from the display center also played a role in recall accuracy, with stimuli closer to the center being recalled more frequently and more accurately.

Conclusion: This study highlights the importance of taking into account both quantitative and qualitative aspects of visual stimuli when assessing the difficulty of a task in working memory. Our findings demonstrate that dense stimulus patterns improve recall performance, likely due to chunking strategies, while a left-side selection bias further complicates task dynamics. These results underscore the need for a more nuanced approach to scaling difficulty in SWM tasks, which could have significant implications for designing adaptive cognitive training programs. By integrating spatial relationships and biases into performance metrics, researchers and educators can develop more sophisticated training tools that are better suited to individuals' cognitive processing abilities.

Keywords: spatial, working memory, task difficulty

The Relationship Between Knee Kinematics and Psychological Indices of Return to Sport in Athletes Following Anterior Cruciate Ligament Reconstruction

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Introduction: Athletes with a history of anterior cruciate ligament (ACL) reconstruction often demonstrate reduced knee flexion angle at heel strike during walking, which may increase the risk of re-injury. Psychological factors such as confidence and perceived readiness to return to sport also play a crucial role in successful rehabilitation outcomes. This study aimed to investigate the relationship between knee kinematics and psychological

indices related to return to sport in athletes after ACL reconstruction.

Materials and Methods: Eighteen male football players with a history of ACL reconstruction participated in this study. Knee kinematics during treadmill walking were recorded using a motion analysis system to assess flexion angles of both reconstructed and non-injured limbs at heel strike. Participants completed the Anterior Cruciate Ligament-Return to Sport after Injury (ACL-RSI) scale and the Anterior Cruciate Ligament-Quality of Life (ACL-QoL) questionnaire. Pearson's correlation coefficient was used to analyze the relationship between knee flexion angles and questionnaire scores.

Results: A significant positive correlation was found between knee flexion angle of the reconstructed limb and both the ACL-RSI score ($r = 0.589$, $p = 0.01$) and the ACL-QoL score ($r = 0.501$, $p = 0.034$). No significant correlation was observed between these psychological measures and knee flexion angle of the non-injured limb ($p > 0.05$).

Conclusion: The findings suggest that psychological readiness and quality of life are associated with biomechanical recovery in athletes following ACL reconstruction. Assessing the interaction between psychological and kinematic factors may help clinicians determine optimal timing for safe return to sport and improve rehabilitation strategies.

Keywords: ACL, Return to Sport

Physical Therapy Approaches for Managing Sarcopenia in Older Adults: A Narrative Review

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Introduction: Primary sarcopenia is characterized by a progressive decline in muscle strength and mass associated with the aging process. This condition leads to reduced mobility, impaired physical function and balance, and contributes to increased sedentary behavior, fall risk, and mortality. Physical therapy offers a broad spectrum of interventions—including exercise therapy, whole-body vibration (WBV), blood flow restriction (BFR), and electrotherapy—that have been proposed to mitigate the effects of sarcopenia. This narrative review aims to evaluate the impact of various physical therapy interventions on muscle mass, strength, and physical performance in elderly individuals affected by sarcopenia.

Materials and Methods: This review encompassed both experimental and review studies involving participants aged 60 years and older who were diagnosed with sarcopenia according to the established criteria (e.g., EWGSOP, AWGS, FNIH). Included studies evaluated the effects of physical therapy interventions and reported at least one sarcopenia-related outcome measure, such as muscle mass, muscle strength, or physical performance.
Results: Exercise therapy—including resistance, aerobic, balance, and multicomponent training—was the most extensively investigated intervention. The results indicate that while all exercise modalities demonstrated beneficial effects, resistance training was the most effective in improving muscle strength. Physical performance outcomes showed substantial improvement across all exercise types. WBV also exhibited positive effects on muscle strength and physical activity performance. BFR combined with resistance training resulted in significantly greater improvements in muscle strength and physical function compared to conventional resistance training. Electrotherapy was less frequently studied in sarcopenic populations; however, whole-body electromyostimulation showed potential for enhancing muscle strength. Notably, none of the interventions produced significant improvements in muscle mass.
Conclusion: Resistance training is the most frequently recommended intervention for improving muscle strength and physical function in sarcopenic patients. When no contraindications are present, combining resistance training with BFR can enhance therapeutic outcomes. WBV may serve as an alternative for individuals unable to tolerate the intensity of conventional resistance training. Additionally, balance training and aerobic exercise should be incorporated based on individual symptoms to improve postural stability and cardiovascular health throughout the course of treatment.
Keywords: Elderly, Exercise, BFR, WBV, Electromyostimulation

Survey of Spinal Arches among New Students of Mazandaran University of Medical Sciences

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Introduction: Evaluation of spinal arches among new students of Mazandaran University of Medical Sciences.
Materials and Methods: 99 first semester students in two groups girls(n = 46, age = 18 ± 4, height = 163 ± 6 cm, weight = 63 ± 12 kg, BMI = 23/9 ± 4/7 kg/mm2, WHR = 1/84 ± 0/86) and boys (n = 53, age = 18 ± 5, height = 177 ± 6 cm, weight = 77 ± 19 kg, BMI = 24/7 ± 5/3 kg/mm2, WHR = 1/79 ± 1/02) were selected. In this research, from the beginning to the end of the first semester of the academic year, The students' posture (forward head posture, kyphosis, lordosis, scoliosis, valgus and varus knees, and flat foot) was measured and evaluated.
Results: The average BMI of male students is higher than that of female students, but

according to the sig greater than 0.05 there is no significant relationship between them. The forward head angle (sig = <0.001); the amount of kyphosis (sig 0.002) and lordosis (sig 0.04) had significant differences between boys and girls.
Conclusion: Due to the prevalence of musculoskeletal disorders in the studied subjects, there is a need to perform corrective movements and increase people's awareness during school and before university in order to identify these abnormalities and change their lifestyle and start regular exercise programs.
Keywords: Postural Structure, Students, Musculoskeletal Disorders

Kinetic Changes of the Gait Initiation in Patients with Chronic Ankle Instability: a Systematic Review

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Introduction: Gait initiation (GI) in people with chronic ankle instability (CAI) differed from healthy controls in the center of pressure (COP) and muscular measures. Some studies reported that these changes in the GI appeared when the gait is started with the affected leg, and others have stated these changes occurred when the GI with the non-affected leg. This systematic review aimed to understand the kinetic and muscular changes between the CAI subjects and healthy controls and between the affected and non-affected legs of CAI people.
Materials and Methods: The protocol of this systematic review was already registered in the PROSPERO database with the no. CRD42023415770. After studies' identification, the process was followed by the PRISMA guideline. Databases of PubMed, Science Direct, Web of Science, Google Scholar, and Scopus from 1990 to 2024 were searched by Population, Exposure, Comparator, and Outcome (PECO) method. The outcome measures in the GI were the COP displacement and rate of COP displacement in the medial-lateral, anterior-posterior, and resultant planes in the S1+ S2(APA, anticipatory postural adjustment) and S3 phases, APA phase time, and onset time of the tibialis anterior and soleus muscles between CAI individuals and controls and between non-affected and affected legs of CAI individuals. Methodological quality assessment of studies was conducted based on the STROBE checklist. The checklist consists of 22 items whose each item assesses a specific aspect of the study report, such as the study design, sampling strategy, or statistical methods, with each item scored "partially reported" (1 point), "no" (0 point), or "fully reported" (2 points).
Results: Six studies with the aim of kinetic and muscular changes on GI in CAI individuals were included for the final evaluation. The analysis was narratively done since meta-analysis could not be performed because of the limitation in the number of studies for each

outcome. Based on the findings, CAI subjects had a shorter medial-lateral COP displacement in the APA phase, whether they started the gait with the affected leg or the non-affected leg. The results of two good and moderate-quality studies showed that CAI people had a shorter medial-lateral COP displacement when initiating the gait with the affected leg than the non-affected one.

Conclusion: The results of the present study showed that CAI individuals, whether they start their gait with the affected leg or with the non-affected one as an initial swing limb, the COP displacement in the medial-lateral direction of the APA phase was shorter than healthy controls. Moreover, these people have less COP changes when the gait was initiated with the affected leg than the non-affected leg.

Keywords: Gait Initiation, Ankle Sprain

The Effects of General Fatigue on Lower Limb Movement Quality in Athletes with Anterior Cruciate Ligament Reconstruction

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Introduction: Athletes with ACL reconstruction (ACLR) are at higher risk of re-injury due to neuromuscular deficits, which may be exacerbated under fatigue. The Single-Leg Squat (SLS) is a simple clinical tool to evaluate movement quality and detect compensatory patterns. This study aimed to investigate the effect of induced fatigue on SLS performance in ACLR athletes compared to healthy soccer players.

Materials and Methods: In this case-control study, 40 male soccer players (20 ACLR, 20 healthy controls) participated. A treadmill running protocol was used to induce fatigue. Participants completed three SLS trials before and immediately after fatigue while barefoot. Performances were recorded and scored based on standardized criteria for hip, knee, ankle, and trunk movement quality. Data were analyzed using repeated measures ANOVA to assess main effects of fatigue, group, and their interaction, with significance set at $p<0.05$.

Results: Both groups showed significant declines in SLS movement quality after fatigue ($F=81.54$, $p<0.001$, $\eta^2=0.68$). Fatigue significantly increased knee valgus ($F=63.50$, $p<0.001$, $\eta^2=0.62$) and foot deviation ($F=46.91$, $p<0.001$, $\eta^2=0.55$) in both groups. No significant between-group differences were observed for hip or trunk movement quality. The group × fatigue interaction was significant ($F=5.91$, $p=0.02$), indicating subtle differences in fatigue response, but the main effect for group was not significant ($F=1.38$, $p=0.24$).

Conclusion: Fatigue significantly impairs lower limb movement quality during the SLS test

in both ACLR and healthy athletes, particularly at the knee and ankle joints. Evaluating movement under fatigue is essential for identifying injury risk and optimizing return-to-sport strategies.
Keywords: Movement Quality, ACL, Athlete, Fatigue

Cervical Muscle Morphology in Unilateral Radicular Neck Pain: A Systematic Review and Meta-analysis

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Introduction: Current evidence has shown the relevance of assessing cervical muscle morphology in patients with neck pain. Data on cervical muscle morphology in other pain conditions such as cervical radiculopathy is lacking. This systematic review/meta-analysis compared morphological features such as cross-sectional area (CSA), anteroposterior (APD) or lateral (LD) diameters of longus colli and multifidus muscles between patients with unilateral cervical radiculopathy and healthy controls.

Materials and Methods: In accordance with PRISMA guidelines, a comprehensive search on PubMed, Scopus, and Web of Science databases was conducted. Peer-reviewed case-control studies in which magnetic resonance (MRI) or ultrasound (US) imaging was used to measure cervical muscle morphology were included. Two reviewers evaluated methodological quality appraisal independently. Standardized dean differences (SMD) and random effects were calculated.

Results: Five studies were included. The meta-analysis showed a significantly smaller CSA of the LC muscle when assessed with ultrasound (SMD = -2.11, 95% CI: -3.95 to -0.26), while MRI findings revealed a non-significant reduction in the CSA of the cervical MF muscle (SMD = -0.21, 95% CI: -1.11 to 0.70) in patients with cervical radiculopathy compared with controls. Regarding LD, the LC muscle showed a non-significant reduction (SMD = -0.21, 95% CI: -0.54 to 0.12), whereas the MF muscle was significantly thinner (SMD = -0.39, 95% CI: -0.75 to -0.02), both assessed with ultrasound. For APD, both LC (SMD = -0.77, 95% CI: -1.39 to -0.15) and MF (SMD = -0.61, 95% CI: -0.95 to -0.28) muscles were significantly smaller in patients than in healthy controls. A subgroup analysis revealed that the CSA of the LC muscle on the involved side was non-significantly greater than on the uninvolved side (SMD = -0.22, 95% CI: -0.64 to 0.20).

Conclusion: Individuals with unilateral cervical radiculopathy exhibit cervical muscle at-

rophy in longus colli and cervical multifidus muscles. Muscle atrophy seems to be higher in the symptomatic radicular side. These findings highlight a potential diagnostic value of muscle morphology in clinical practice.

Keywords: Radiculopaty, Multifidus, Ultrasound, Meta- analysis

Combined Aerobic and Resistance Exercises as a Complementary Approach in the Management of Silicosis: A Systematic Review

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Introduction: Silicosis is one of the most important and prevalent occupational lung diseases worldwide, caused by long-term inhalation of crystalline silica particles. It is characterized by progressive fibrosis and a decline in pulmonary function, with no definitive cure available. Given the pathophysiological similarities between silicosis and other chronic pulmonary diseases (such as COPD and ILD), physiotherapy interventions—particularly aerobic and resistance exercises—may serve as complementary strategies to improve functional capacity and quality of life in affected patients. This study aimed to review the existing scientific evidence on the effects of aerobic and resistance training in the management of patients with silicosis.

Materials and Methods: A systematic search was conducted in the PubMed, Scopus, ScienceDirect, and Google Scholar databases using the keywords “silicosis,” “aerobic exercise,” “resistance training,” and “pulmonary rehabilitation.” Studies published between 2015 and 2025 were screened, and eight articles—including reviews, clinical trials, and animal studies—were selected and qualitatively analyzed.

Results: The reviewed studies indicated that moderate-intensity aerobic exercises (such as brisk walking, cycling, or treadmill training, 30-45 minutes per session, 3-5 sessions per week) significantly improved patients’ functional capacity. Improvements were commonly assessed using the Six-Minute Walk Distance (6MWD) test, a simple and reliable indicator of daily activity tolerance. The mean increases in 6MWD ranged from 40 to 60 meters after 8 to 12 weeks of training. Resistance exercises (using weights or elastic bands, 2-3 sessions per week) were associated with increased limb and accessory respiratory muscle strength, reduced dyspnea, and improvements in FVC and FEV_1 indices. Moreover, animal studies demonstrated that regular physical activity could suppress inflammatory pathways such as IL-17A and TGF-β, thereby preventing the progression of pulmonary fibrosis.

Conclusion: The combination of aerobic and resistance exercises, when performed with controlled intensity and duration, appears to be a safe and effective complementary approach to improve pulmonary function, enhance functional capacity, and promote quality of life in patients with silicosis. However, larger and more rigorously designed clinical trials are needed to determine the optimal exercise dosage and intensity for this population.

Keywords: Silicosis, Aerobic Exercise, Resistance Training, Pulmonary Rehabilitation, Pul-

monary Function

Scapulohumeral Rhythm in Individuals with and without Active Trigger Points in The Upper Trapezius

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Introduction: The scapulohumeral rhythm plays a pivotal role in maintaining optimal shoulder biomechanics during arm elevation, particularly in abduction. Disruption of this coordinated movement between the scapula and humerus has been implicated in various musculoskeletal disorders. Among these, myofascial trigger points in the upper trapezius, as one of the main muscles associated with scapular control, may alter neuromuscular activation patterns, leading to compensatory strategies and impaired rhythm. Investigating scapulohumeral coordination in individuals with upper trapezius trigger points is essential to elucidate the biomechanical consequences of localized muscle dysfunction and help to design targeted rehabilitation strategies aimed at restoring efficient shoulder biomechanics.
Materials and Methods: 13 individuals with active myofascial trigger points in the Upper trapezius (aged 29.40 ± 4.82 years) and 11 individuals without active myofascial trigger points in the Upper trapezius (aged 28.41 ± 5.99 years) participated in this study. The participants were set up with twelve reflective markers on the humerus, scapula and trunk tracked by a motion capture system to assess the glenohumeral and scapula range of motions. The participants executed three maximal shoulder abduction task based on the examiner's instructions. SHR was calculated as the ratio between glenohumeral abduction and scapular upward rotation range of motion. The measurements were processed and analysed using a customized subroutine and SPSS 17, respectively.
Results: The results demonstrated that individuals with upper trapezius trigger points had a greater SHR value compared to those without trigger points (Cohen's d= 0.85, 95% CI= (-1.20, -0.005), (P=0.040)), despite no significant differences in the absolute range of motion for glenohumeral abduction (healthy group:129.3 ± 21.3, trigger point group: 133.4 ± 30.7, P=0.660) or scapular upward rotation (healthy group: 27.2 ± 9.1, trigger point group: 29.9 ± 8.4, P=0.450) between the groups.
Conclusion: The elevated SHR value in the trigger point group suggests a relative imbalance in joint contribution during arm abduction execution, potentially reflecting altered neuromuscular coordination or compensatory motor strategies associated with localized dysfunction in the upper trapezius. These results represent the importance of evaluating intersegmental coordination, not just isolated joint mobility, when assessing shoulder biomechanics in the presence of myofascial impairments.
Keywords: SHR, Shoulder, Trigger Points

Alteration in Onset Time is Linked to Active Trigger Points in the Upper Tra-

pezius Muscle during Flexion

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Introduction: Myofascial trigger points, which are palpable tender knots in skeletal muscles, often cause either localized or referred pain. The upper trapezius muscle is more susceptible to trigger points in the shoulder region. The current study aimed to investigate the effect of active trigger points on the onset time of muscles.
Materials and Methods: Fifteen participants (aged 29.4 ± 4.8) with active upper trapezius MTrPs and thirteen healthy controls (aged 28.5 ± 6.07) performed standardized shoulder flexion tasks. Surface EMG recordings from trapezius subdivisions and deltoFifteen participants (aged 29.4 ± 4.8) with active upper trapezius MTrPs and thirteen healthy controls (aged 28.5 ± 6.07) performed standardized shoulder flexion tasks. Surface EMG recordings from trapezius subdivisions and deltoid head muscles. The onset of muscle activity was determined relative to the activation of the anterior deltoid. Statistical comparisons were made using independent t-tests with SPSS version 17, considering a p-value of less than 0.05 as significant. id head muscles. Statistical comparisons were made using independent t-tests with SPSS version 17, considering a p-value of less than 0.05 as significant.
Results: Individuals with MTrPs demonstrated significant delays in the onset timing of the middle deltoid (p = 0.01, d = 1.03) and lower trapezius (p = 0.05, d = 0.76). However, there was no significant difference between these groups in the onset of upper trapezius, middle trapezius, anterior and posterior deltoied.
Conclusion: These results showed that ATrps of UT are associated with altered muscle recruitment patterns and onset time in different parts of the muscle during flexion. Changes in muscle recruitment patterns can lead to modifications in movement control. Ultimately, individuals with an active myofascial trigger point in the upper trapezius may experience decreased movement control and increased risk of shoulder injuries
Keywords: Trigger Point, EMG, Upper Trapezius

Bracing versus No Bracing ater Anterior Cruciate Ligament Reconstruction: A Systematic Review of Randomized Controlled Trials

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Introduction: Anterior cruciate ligament (ACL) reconstruction is one of the most common orthopedic procedures among athletes aiming to restore knee stability and return to sport. The postoperative use of functional knee braces remains controversial, as evidence regarding their clinical benefit is inconsistent. This systematic review aimed to evaluate randomized controlled trials (RCTs) comparing functional knee bracing with no bracing after ACL reconstruction, focusing on functional outcomes and re-injury rates.

Materials and Methods: This review was conducted according to PRISMA guidelines. PubMed, Embase, Cochrane CENTRAL, SPORTDiscus, Web of Science and SID databases were searched through April 2025 using these keywords and their related MeSH terms: "Anterior Cruciate Ligament Reconstruction", "Orthotic Devices", "Braces". Eligible studies were English-language RCTs comparing postoperative functional bracing with no bracing during rehabilitation or return-to-sport phases. Two reviewers independently performed study selection, data extraction, and risk of bias assessment using the Cochrane RoB 2 tool. Due to heterogeneity across studies, results were synthesized qualitatively.

Results: Nine RCTs involving approximately 650 participants met the inclusion criteria. Most studies included young athletic populations who used hinged or dynamic braces for 6-12 weeks postoperatively. Across trials, no significant differences were found between braced and non-braced groups in knee stability (KT-1000, Lachman, pivot-shift), return-to-sport timing, or graft re-injury rates at follow-up periods up to two years. Some studies noted greater subjective confidence among braced participants, though this did not translate into improved functional outcomes.

Conclusion: Current evidence does not support the routine use of functional knee bracing after ACL reconstruction for improving stability, function, or re-injury prevention. While bracing may enhance psychological reassurance, structured exercise-based rehabilitation remains the cornerstone of postoperative recovery. Further high-quality RCTs with standardized outcomes are warranted to clarify the role of functional bracing in ACL rehabilitation.

Keywords: ACLR, Braces, Recovery of Function, Return to Sport

Shockwave Therapy and Acetic Acid Iontophoresis in Supraspinatus Tendon Calcification: A Case Report Classified as Gärtner Type I and Large Calcific Deposit

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Introduction: Calcific tendinitis of the shoulder is a common cause of pain and functional limitation. Large and dense deposits (Gärtner type I) are associated with a poorer prognosis for spontaneous or conservative resorption. This case report describes the effectiveness of combined extracorporeal shockwave therapy (ESWT) and acetic acid iontophoresis in the management of a large Gärtner type I supraspinatus calcification.
Case Presentation: A 58-year-old woman presented with a 16-year history of right shoulder pain and a recent episode of acute exacerbation. Clinical examination revealed almost no active range of motion and severe pain. Imaging confirmed a large (1.8 cm) dense calcific deposit classified as Gärtner type I in the supraspinatus tendon.
Results: The treatment protocol consisted of 10 sessions of standard physiotherapy for pain management and two sessions of acetic acid iontophoresis (0.05%, 15 minutes, 6-8 mA), which were discontinued due to skin irritation. Therapy was immediately followed by five sessions of standard-parameter ESWT. Assessments were conducted using the Visual Analog Scale (VAS) for pain, Global Rating of Change (GRC), range of motion (ROM), the Disabilities of the Arm, Shoulder and Hand (DASH) questionnaire, and follow-up imaging at three time points. By the end of the treatment period and at the three-month follow-up, the patient demonstrated remarkable improvement across all measures. Pain intensity decreased from 8 to 2 on the VAS, and substantial gains were observed in DASH scores, ROM, and GRC ratings. Follow-up imaging revealed significant resorption of the calcific deposit.
Conclusion: These findings suggest that combining ESWT with acetic acid iontophoresis may offer an effective, non-invasive treatment option for large, dense, and treatment-resistant calcific deposits, even in cases with poor prognostic characteristics. Further clinical trials are recommended to confirm these results.
Keywords: Calcific Tendinitis, Shockwave, Iontophoresis

Immediate Respiratory Warm-Up Effect on Dynamic Inspiratory Muscle Strength in Cardiac Surgery Candidates

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Introduction: Postoperative pulmonary complications (POPC) are common after cardiac surgeries such as coronary artery bypass grafting (CABG) and are influenced by factors including anesthesia and surgical trauma. Inspiratory muscle training (IMT) with visual biofeedback may mitigate these complications. This study investigates the impact of threshold loading inspiratory muscle training (TL-IMT) combined with respiratory biofeedback on the dynamic strength of inspiratory muscles (S-index) in patients undergoing CABG surgery during their hospitalization phase.

Materials and Methods: A single-blind study was conducted with 38 CABG candidates at Shahid Modares Hospital, Tehran. Participants were randomized into two groups: the TL-IMT with biofeedback group and the placebo IMT group. TL-IMT exercises were performed at 30% of maximum dynamic inspiratory strength using the Power Breath K5 device, with visual biofeedback displayed on the screen. The placebo group performed the same exercises at minimal load without biofeedback. Both groups received standard respiratory physiotherapy. Measurements of S-index, peak inspiratory flow (PIF), and vital capacity (VC) were taken before surgery (T1), one day after surgery (T2), and at discharge (T3).

Results: Both groups showed significant changes, with a decrease from T1 to T2 and an increase from T2 to T3. In the study group, T3 values remained the same as at T1, while the placebo IMT group experienced a significant decrease. After surgery, both groups had a drop in the S-index. However, the study group saw more pronounced changes between T3-T2 and T3-T1 compared to the control group, although no significant difference was found between T2-T1. By the time of discharge, the TL-IMT group had higher S-index values than the placebo group, returning to preoperative levels. Additionally, the TL-IMT group showed improvements in PIF and VC

Conclusion: TL-IMT with visual biofeedback effectively maintains dynamic inspiratory muscle strength and improves key pulmonary parameters in cardiac surgery patients. These findings suggest that integrating TL-IMT with biofeedback can enhance postoperative recovery and reduce the incidence of POPC.

Keywords: Respiratory Pressure, Warm up, Cardiac Disease

Machine Learning Framework for SEMG-Based Hand Movement Classification to Enhance Physiotherapy Assessment and Prosthetic Control

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Introduction: Restoring hand dexterity in neurologically impaired patients remains a key rehabilitation challenge. Surface electromyography (sEMG) offers an objective solution for muscle activity assessment, crucial for addressing needs of 10-15 million upper limb amputees worldwide. Recent advances show artificial neural networks achieve superior motion recognition accuracy , while sEMG-based smart gloves provide viable alternatives to conventional therapy . Despite EMG signals' noisy nature, nonlinear analysis methods effectively overcome these limitations . Single-channel systems demonstrate particular promise with reduced complexity and cost . This study bridges technical innovation and clinical practice by developing novel sEMG classification methods to address physiotherapy challenges through systematic investigation of feature reduction techniques and their impact on classification performance.

Materials and Methods: This study involved six healthy participants (three females, three males, age: 25±5 years, BMI: 19±2 kg/m^2). Surface EMG signals were recorded from the flexor digitorum muscle during six hand movements using Ag/AgCl electrodes with 2 cm inter-electrode spacing. The SUBTEL chipset amplified signals, while Arduino Nano performed analog-to-digital conversion at 1000 Hz sampling rate. A 4th-order Butterworth band-pass filter (20-500 Hz) eliminated noise and powerline interference. Each movement underwent 29 valid trials after removing initial artifacts. Signals were segmented into non-overlapping 5-second windows, from which 24 time-frequency features were extracted. We implemented Artificial Neural Networks (ANN) and Long Short-Term Memory (LSTM) networks, comparing their performance with and without Linear Discriminant Analysis (LDA) for feature reduction. Classification metrics including accuracy and precision were calculated using standard equations to evaluate system performance in movement recognition.

Results: EMG signals were successfully processed using 5-second windows and 24 feature extractions. Following LDA feature reduction, classification compared ANN and LSTM methods. Results demonstrated LSTM's superior performance with 95.83% mean accuracy, significantly outperforming ANN by 13.18%. The LSTM-LDA hybrid maintained competitive accuracy at 94.25%, while ANN-LDA showed improved consistency across participants compared to standalone ANN. These findings highlight LSTM's robustness in EMG classification tasks.

Conclusion: This study confirmed that deep learning (LSTM) outperforms traditional machine learning in classifying EMG movement data, achieving 95.83% accuracy. This high sensitivity allows for detecting subtle muscle activation changes, crucial for tracking patient rehabilitation progress. The findings have key physiotherapy applications: serving as an objective assessment tool, enabling real-time biofeedback games for patient engagement, and providing natural control for prosthetics and rehabilitation robots. However, challenges include the need for large datasets and high computational power. Future work will validate the system with real patients (e.g., stroke survivors) and explore combining EMG with Inertial Measurement Units (IMUs) for a more comprehensive movement analysis.
Keywords: Long-ShortTerm Memory(LSTM)units, Artificial Neural Network(ANN), Deep Learning, EMG Classification

The Comparison between Common Physiotherapy with Telerehabilitation and Common Physiotherapy Treatment alone on Quality of Life, Balance in Sitting Position, Functional Status and Treatment Effectiveness in People with Spinal Cord Injury: Randomized Control Trial

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Introduction: Aim of this study is to compare common physiotherapy treatment with remote physiotherapy treatment with common physiotherapy treatment alone on parameters of quality of life, balance in sitting position, functional status and effectiveness of treatment in people with spinal cord injury.
Materials and Methods: Participants were divided into common physiotherapy and tele-rehabilitation groups. Outcomes that includes T-shirt test ,quality of life and functional status tests were recorded before and after treatment for study participants.
Results: In analyzing the results of the study, significant differences were observed in the T-shirt test in both groups. In the results of the quality of life test, it was observed that the effect size of the treatment group was 1.75 times larger than the control group in the two groups. In the results of the functional status test, it was observed that the effect size of the treatment group was 1.17 times larger than the control group in the two groups. In independent t-test, comparing the results before treatment between the two groups and after treatment between the two groups, significance was observed only in the quality of life and functional status tests in the two groups.
Conclusion: The results of this randomized controlled clinical trial indicate that telephysiotherapy combined with conventional physiotherapy had positive effects on sitting balance, quality of life, and functional status of individuals with spinal cord injury.
Keywords: SCI, Physiotherapy, Tele-Rehabilitation, Functional Performance

Using Dynamic Weight Suspension Technology for Children's Walking

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Introduction: In this study, we evaluated the efficacy of dynamic bodyweight-supported training on the gait quality of children with different neural disorders.
Materials and Methods: Seventeen ambulatory children, aged 3 to 11 years, experiencing gait limitations, were selected to participate in the designed gait training program. Each child participated in 10 practice sessions held three days a week, with each training session using the dynamic body weight support system, comprising three stages, and lasting 20 minutes. Clinical assessments were conducted using four functional tests: "Five Time Sit to Stand Test (FSST)", "Modified Time Up and Go (MTUG)", "Time Up and Down Stairs (TUDS)", and "Pediatric Berg Balance Scale" (BBS).
Results: Statistical tests demonstrated a significant increase in the post-values of the BBS after gait training. Notably, children with higher relative cognitive abilities showed more improvement. Additionally, there was a significant enhancement in the assigned score for the level of independence. As all participants had received conventional physical therapies for more than three years, reaching their maximum obtainable improvements with conventional training methods, the observed improvements could be attributed to the designed training protocol even without a control group.
Conclusion: Designed gait training protocol using a dynamic weight support system proved effective in enhancing balance, improving gait quality, and increasing the level of independence during performing functional tests in ambulatory children suffering from different locomotor disabilities.
Keywords: Gait, Child, Walk, Postural Balance

The Effect of Dry Needling Combined with Ankle Joint Mobilization and Therapeutic Exercise Compared to Ankle Joint Mobilization and Therapeutic Exercise alone on Balance, Range of Motion, Pain and Function in Individuals with Chronic Ankle Instability: a Randomized Clinical Trial

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Introduction: chronic ankle instability (CAI) is a common consequence of recurrent ankle sprains, leading to impaired balance, reduced dorsiflexion range of motion (ROM), pain and functional limitations. conventional treatments like ankle joint mobilization and therapeutic exercise are effective, but the added benefit of dry needling remains uncertain. this study compares the effectiveness of ankle joint mobilization and therapeutic exercise with and without dry needling on balance, dorsiflexion rom, pain and function in individuals with chronic ankle instability.

Materials and Methods: this randomized clinical trial included 33 participants with unilateral CAI, randomly assigned to either the intervention group (mobilization+ therapeutic exercise+ dry needling) or the control group (mobilization+ therapeutic exercise). the intervention was conducted over 4 weeks (3 sessions per week), with dry needling applied once weekly in the intervention group. outcome measures, including dynamic balance (assessed by the modified star excursion balance test), dorsiflexion ROM (measured by the weight-bearing lunge test), pain (evaluated using the numerical rating scale, NRS), and function (assessed by the Cumberland Ankle Instability Tool (CAIT) and Foot and Ankle Ability Measure (FAAM), were evaluated before the intervention, immediately after, and one month post-intervention.

Results: both groups showed significant improvements in dynamic balance ($p<0.001$), with mean scores increasing from 209.23 to 278.06 (intervention) and 200.34 to 259.75 (control), but no significant inter-group difference ($p=0.92$). dorsiflexion ROM improved significantly ($p<0.001$) and 9.16 to 13.31 degree (control), with no group difference ($p=0.95$). pain decreased significantly ($p<0.001$) from 6.00 to 1.29 (intervention) and 6.63 to 1.25 (control), with no group difference ($p=0.75$). CAIT and FAAM scores improved significantly ($p<0.001$), but no significant inter-group difference were found ($p>0.05$).

Conclusion: both treatment protocols were effective, leading to significant improvements in patients with CAI. however, the addition of dry needling to the combined mobilization and therapeutic exercise protocol did not result in significant improvements in balance, dorsiflexion ROM, pain, or function compared to the control group. these findings suggest that dry needling may have greater efficacy in specific conditions or with different protocols (e.g. increased session frequency), warranting further investigation in future studies.

Keywords: Chronic Ankle Instability, Dry Needling

Reliability of Center of Pressure Measures in Chronic Stroke Survivors: Influence of Motor and Cognitive Dual-tasking

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Introduction: This study investigated the impact of frontal plane-focused balance training (FPBT) on fall prevention in stroke survivors.
Materials and Methods: Sixteen people (49.31±15.5 years, five females) with chronic stroke were assessed in two sessions, 48 hours apart. Participants completed three balance control conditions: single-task, motor dual-task, and cognitive dual-task, while they performed three trials of open-eye quiet standing and semi-tandem standing. Three trials of closed-eye quiet standing were conducted in the single-task condition. A two-way random model of the Intraclass correlation coefficient (⟦ICC⟧_2,3), standard error of measurement (SEM), and minimal detectable change (MDC) were calculated for CoP mean velocity, anterior-posterior (AP) and medial-lateral (ML) mean velocity, the standard deviation of AP and ML velocity, and sway area.
Results: Within-day ICC values were higher than between-day values (ICC: 0.78- 0.96). Mean velocity and mean and SD of velocity in the AP direction showed the highest relative and absolute reliabilities in an open-eyes quiet standing position (ICC: 0.82- 0.92, SEM: 0.67- 1.24). Dual-tasking could increase the reliability of the CoP measures, except for the sway area (ICC: 0.53- 0.93 changed to 0.84-0.96). MDCs ranged from 1.03 to 7.77 mm/s for velocity-based variables.
Conclusion: Assessing the postural control system during dual-task conditions provides more reliable CoP measures, especially in a semi-tandem standing position. These findings can provide clinicians with valuable insights into detecting specific balance problems that post-stroke individuals encounter.
Keywords: Reliability, Balance, CoP-Measures, Dual-Task, Stroke

The Effect of Adding Dry Needling to Muscle Energy Technique on Flexibility and Physical Function in Athletes with Hamstring Muscle Tightness: A Randomized Controlled Trial

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Introduction: Hamstring tightness is one of the most common problems in athletes, associated with decreased flexibility and an increased risk of injury. Muscle Energy Technique (MET) and Dry Needling (DN) are effective methods for improving this condition, but the effect of their combination has not been investigated. This study aimed to investigate the effect of adding dry needling to MET on flexibility and physical performance in athletes with hamstring tightness.

Materials and Methods: This study was a double-blind (assessor and patient) randomized controlled clinical trial with a placebo and a 1:1 randomization ratio. Thirty recreational athletes (15 per group) with hamstring tightness \ge 20^\circ in the Active Knee Extension (AKE) test participated. Inclusion criteria were age 18-35 years and recreational athlete status. Assessments included Active Knee Extension range of motion, stretch tolerance, Single-Hop test, and Triple-Hop test. The intervention was performed in 3 sessions (every other day): an intervention group (DN + MET) and a control group (Placebo DN + MET).

Results: The mean increases in Active Knee Extension range of motion, stretch tolerance, Single-Hop performance, and Triple-Hop performance in the intervention group after treatment were significantly greater than in the control group ($p < 0.001$ for all).

Conclusion: Adding dry needling to MET is an effective therapeutic approach for improving flexibility and physical performance in athletes with hamstring tightness. This combination can be a proposed protocol for clinicians.

Keywords: Hamstring, Dry Needling, MET, Flexibility

Effect of Craniocervical Muscles Dry Needling on Somatosensory Tinnitus Symptoms: A Double-Blinded Randomized Controlled Trial

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Introduction: Tinnitus is one of the most challenging auditory complaints with a variety of causes and types. One subtype of subjective tinnitus is called somatosensory or somatic tinnitus, in which musculoskeletal disorders of the head, neck, and temporomandibular joint (TMJ), such as myofascial trigger points (MTrPs), can contribute to the perception of tinnitus. The aim of this study was to investigate the effects of dry needling (DN) on somatosensory tinnitus symptoms and the quality of life in affected patients.
Materials and Methods: In this double-blind randomized clinical trial, 24 male and female participants mean aged 18 years and older with somatosensory tinnitus associated with MTrPs in the head, neck, and jaw region for more than 3 months were enrolled. Subjects were randomly assigned in equal numbers to either the treatment group (dry needling) or the control group (placebo dry needling). Both groups received three treatment sessions on alternate days. The outcome measures included tinnitus loudness and annoyance, pain intensity, pressure pain threshold (PPT), tinnitus-related functional disability. Assessments were conducted at four time points: before treatment, immediately after the first session, immediately after the third session, and one week post-intervention
Results: Within-group analysis in the intervention group revealed significant improvements in tinnitus loudness and annoyance, pain levels, and functional disability due to tinnitus at the one-week follow-up compared to baseline ($P<0.05$). The interaction effects of time and group showed that dry needling treatment led to statistically significant improvements compared to the control group (placebo dry needling) in reducing tinnitus loudness and annoyance, decreasing pain, and improving functional disability associated with tinnitus ($P < 0.05$). However, no significant differences were observed between the two groups for the PPT variable ($P = 0/71$).
Conclusion: This study demonstrated that dry needling of myofascial trigger points in the craniocervical region can effectively improve symptoms of somatosensory tinnitus and enhance quality of life in affected patients.
Keywords: Tinnitus, Somatosensory, Tinnitus, Dry Needling

The Effect of Backpack Weight on the Postural Alignment of the Neck, Shoulders, and Trunk in Healthy Young Individuals

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Introduction: Among the methods of carrying loads, backpack is certainly one of the most widespread.in most developed countries, students start primary school at the age of 5-6 and finish high school at the age of 18-19; this means that they carry loads 5-6 days a week for more than a decade, which has a significant impact on their physical development. Among adults, backpacks are also a very widely used accessory in both professional life and sports. According to research, wearing a backpack causes postural changes when standing and walking in children and adolescents, which can lead to injury. the paucity of studies, low-level evidence, inconsistent results, and small sample sizes limit the recommendation of appropriate loads. The aim of this study was to investigate the effect of backpack weight on postural body angles including CVA, CHA, SSP, and TFL during static load-bearing in healthy subjects aged 18 to 30 years.

Materials and Methods: This cross-sectional study was conducted on 73 healthy individuals. A posture analysis device was used to record the postural angles of each individual in 4 different load-bearing positions (no backpack, 10%, 20%, and 30% of body weight). The sampling method in this study was non-probability and simple. None of the participants were excluded, and 73 healthy individuals were subjected to statistical analysis. To examine the main and interaction effects of different backpack weights and statistical analysis, multivariate analysis of variance was used.

Results: In general, the effect of backpack load on the craniovertebral angle (CVA) was not statistically significant, but the angle decreased with increasing load. In a pairwise comparison between loads, the 20% body weight condition compared to no backpack and the 30% condition compared to no backpack were statistically significant. the effect of backpack load on the cranio horizontal angle (CHA) was not statistically significant, but with an increase in load above 20% of body weight, we have a decrease in the cranio horizontal angle (CHA). the effect of backpack load on the sagittal shoulder posture (SSP) was statistically significant, As the load increases, we see an increase in the SSP angle. the effect of backpack load on the trunk forward lean angle (TFL) was statistically significant, the TFL angle increases with an increase in load to 20% of body weight, and decreases slightly at a load of 30% of body weight.

Conclusion: The weight of the backpack seems to have less of an effect on the craniovertebral angle, However, at weights higher than 20% of body weight, this angle decreased compared to the situation without a backpack. As the load increases, we see an increase in the SSP angle, which actually helps reduce rounded shoulder and improve shoulder alignment and retraction, but the TFL angle increases with an increase in load to 20% of body weight. when you carry a heavy backpack, especially for extended periods, the weight pulls you backward, forcing you to lean forward to compensate. This unnatural

posture can strain your neck, shoulders, and lower back and Since a decrease in craniovertebral angle leads to an increase in the forward head posture, the use of backpacks heavier than 10% of body weight is not recommended.

Keywords: Backpack, Posture, Load

An Objective Quantification of Spasticity in Chronic Ischemic Stroke

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Introduction: Spasticity is a common issue following a stroke, causing increased muscle tone that hinders daily activities. Current clinical assessments like the modified Ashworth or modified Tardieu scales are subjective and may lack accuracy. This study aims to introduce an objective method for quantitatively measuring spasticity.

Materials and Methods: Twenty-four chronic stroke patients (mean age of 50.54±9.44 years) with upper limb spasticity participated in the study. Passive stiffness during extension and reflex torque in the wrist were measured using an isokinetic device at two angular speeds: 5 and 180 °/s. Data were extracted using Python software and then analyzed statistically.

Results: Analysis revealed that higher device speeds recruited the spasticity more. Greater spasticity severity was associated with higher reflex torque. In addition, a strong correlation was observed between the severity of spasticity and the new assessment method.

Conclusion: This study suggests a standardized objective method for spasticity assessment, which could benefit future research in this area.

Keywords: Spasticity, Isokinetic, Reflex torque

Effects of Upper-Body Interval Training on Cognitive Function in Adults: A Randomized Controlled Study

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Introduction: Regular physical activity is well known to benefit both body and mind. While most studies have focused on whole-body or lower-body training, the effects of upper-body interval training (UBIT) on cognitive function are less studied. Given that some patients (e.g. with mobility limitations or heart failure) may preferentially use upper-body ergometers or arm cycling, it is important to examine whether interval training with upper limbs can yield improvements in cognition, particularly in domains such as attention, working memory, and executive function.
Materials and Methods: In a randomized controlled design, 50 sedentary adults aged 45-65 were allocated to either an upper-body interval training group (n = 25) or a control group (usual activity, n = 25). The UBIT protocol lasted 10 weeks, with three supervised sessions per week. Each session included warm-up, repeated cycles of high-intensity arm ergometry (≈ 80-85% of peak heart rate for arms) alternating with low-intensity recovery phases, followed by cool-down. Before and after the intervention, cognitive assessments were administered covering working memory (e.g. n-back test), executive function (e.g. Stroop test, task switching), attention, and processing speed. Physiological measures included upper-body aerobic capacity, heart rate variability, and blood biomarkers (e.g. BDNF).
Results: No major adverse events occurred, and adherence exceeded 90%. After 10 weeks, the UBIT group showed significant improvements over controls in working memory ($p < 0.01$), executive function ($p < 0.05$), and processing speed ($p < 0.05$). Attention improved modestly (trend, $p = 0.07$). Physiological outcomes also improved: upper-body aerobic capacity increased by ~15% ($p < 0.01$), heart rate variability showed enhanced autonomic balance (increased parasympathetic indices, $p < 0.05$), and BDNF levels rose significantly ($p < 0.01$). Effect sizes for cognitive domains were small to moderate (Cohen's $d = 0.4$-0.6).
Conclusion: These findings suggest that upper-body interval training is an effective strategy to enhance cognitive function, even when involving only the arms, possibly through improved cardiovascular response, increased neurotrophic support, and enhanced cerebral perfusion.
Keywords: BDNF, HIIT, Cognition

Utilization of Blood Flow Restriction Training in an Athlete with Medial Meniscal Cyst: A Case Report

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Introduction: Meniscal cysts may cause medial joint-line pain and functional instability. Restoring muscle strength is difficult when pain limits exercise intensity. We report the combined use of therapeutic ultrasound, transcutaneous electrical nerve stimulation (TENS) and low-load blood flow restriction (BFR) training in a young athlete with symptomatic medial meniscal cysts.
Materials and Methods: A 19-year-old female Taekwondo athlete with MRI-confirmed medial meniscal cyst and medial knee pain (NPRS 7/10) underwent ten consecutive physiotherapy sessions incorporating pulsed therapeutic ultrasound (1 MHz, 1.5 W/cm^2), TENS (varied frequency protocol) and BFR-assisted low-load resistance exercises (cuff at 70% AOP; 4 sets; 30/15/15/15 reps) targeting hip extensors, abductors, external rotators and quadriceps. Outcomes measured pre- and 1 day post-treatment included NPRS, manual muscle testing (MMT), McMurray/Thessaly tests and double leg lowering test (DLLT). A one-year telephone follow-up was performed.
Results: After treatment NPRS decreased to 3/10; hip external rotators and extensors improved to 5/5, hip abductors to 4/5; McMurray and Thessaly tests became negative; DLLT improved from poor to Fair+. At one-year follow-up the patient reported complete resolution of pain and no episodes of giving way.
Conclusion: In this case, combining therapeutic US, TENS and low-load BFR training was feasible, well tolerated and temporally associated with reduced pain and improved muscle strength. Controlled studies are required to establish causality and optimal protocols.
Keywords: Blood Flow Restriction, Meniscal Cyst

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