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Contents

The ***1st Panhellenic Physiotherapy Students Congress*** (1st PSFF) was an initiative of the students of the Physiotherapy Department of the University of Thessaly aiming to create a meeting hub for the dissemination of research efforts of the Physiotherapy Departments of the country.

The Physiotherapy Departments in Greece have shown a significant increase in research since 2018, as Greek Highest Education academic institutions. Therefore, student conferences aim to spread these research activities at every level of study (undergraduate, postgraduate, and doctorate), in Greece and abroad.

The University of Thessaly hosted the 1st PSFF on March 10-12, 2023. Over 700 physiotherapy, nursing, and occupational therapy students of all levels (undergraduate, postgraduate, and doctoral) from the Departments of the University of Thessaly, the International Hellenic University, the University of West Attica, the University of Patras, the University of Peloponnese, the University of Western Macedonia and the National Kapodistrian University of Athens participated.
As part of the conference, an innovative competition of knowledge and clinical reasoning for undergraduate physiotherapy students, named "Olympiad in Physiotherapy Knowledge", took place.

More than 100 research abstracts were submitted and presented in the form of oral and e-poster presentations. The best presentations of undergraduate, postgraduate, and doctoral students as well as the best undergraduate presentation from the Physiotherapy Department of each University were awarded.

The journal "Fysikotherapeia" will publish in two issues abstracts of the studies that were presented. Their study will give the chance to the readers to acknowledge the high level of effort and outcomes achieved by our new students as well as the knowledge they have obtained via the compound of teaching and research.

Dr. Eleni A. Kortianou
Associate Professor
Head of Physiotherapy Department
University of Thessaly

Dr. Zacharias Dimitriadis
Assistant Professor, Physiotherapy Department, University of Thessaly

Paul Kitixis
Physiotherapy Undergraduate Student,
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THE EFFECT OF SARS-COV-2 INFECTION ON THE INCIDENCE OF MUSCULOSKELETAL INJURIES IN YOUNG FOOTBALL PLAYERS AGED 15-16 YEARS

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INTRODUCTION: In recent years, increased injury rates have been observed in athletes due to infection from SARS-CoV-2 virus. An explanation for these results might be the effects of SARS-CoV-2 infection on various body systems, including the musculoskeletal system. The aim of this study is to determine whether young football players who have been infected with SARS-CoV-2 virus present more musculoskeletal injuries compared to non-infected athletes.

METHODOLOGY: 16 young football athletes (average age 15,5 years, height 1,74m, body mass 65,3 kilos, BMI 21) participated in this study. The survey was conducted during the 2021-2022 season and used a short 5-section questionnaire.

RESULTS: 81% of participants were infected with SARS-CoV-2 of which 76% were symptomatic (fever 80%, fatigue 60%, cough 40%). 30% of participants developed Long-Covid symptoms (fatigue 66%, muscle pains 66%). Musculoskeletal injuries (muscle injuries 52% and 33% respectively, ligament injuries 28% and 66%, tendinopathy 12%, bone injuries 4%) occurred in 84% of infected participants and in 66% of non-infected mainly in the lower extremities.

CONCLUSION: In the present study, we found that SARS-CoV-2 increases the incidence of musculoskeletal injuries in young football players. Anthropometric characteristics such as age and BMI did not affect the incidence of injuries. It is important that athletes follow specialized prevention and reintegration programs upon their return to activity to reduce the risk of injury.

"RELIABILITY AND VALIDITY OF A CONVENTIONAL MEASURING TAPE METHOD FOR ASSESSING THORACOLUMBAR JOINT POSISION SENSE AND RANGE OF MOTION IN HEALTHY INDIVIDUALS."

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INTRODUCTION: Patients with low back pain have a disturbance of thoracolumbar proprioception and range of motion. The literature provides a range of methods for their evaluation. The conventional tape measure method is a popular method that has been used in clinical practice and research to assess the range of motion of the lumbar and thoracolumbar spine and the joint position sense. However, the clinical properties of the tape measure method have not been investigated for the assessment of proprioception. The purpose of the research is to examine the intra-rater reliability of the tape measure method for evaluating proprioception and the range of motion of the thoracolumbar spine.

METHODS: The study involved 20 healthy individuals. The assessment method used in the study was the conventional tape measure. The conventional tape measure method uses the measurement of the distance between the C7 and S1 vertebrae to evaluate the thoracolumbar region of the spine. The movement used to measure the range of motion and assess thoracolumbar proprioception was the bending of the thoracolumbar region.

RESULTS: The intra-rater reliability of the method using the measuring tape for the assessment of thoracolumbar proprioception was found to be poor to moderate in healthy individuals with ICC (0.43-0.73). The intra-rater reliability of the method using the measuring tape for the range of motion of the thoracolumbar spine was found to be good in healthy individuals with ICC (0.75-0.85).

CONCLUSIONS: The conventional tape measure method is a highly reliable procedure for assessing the range of motion of the thoracolumbar spine in healthy individuals. For assessing the proprioception of the thoracolumbar spine, the conventional tape measure method is reliable, although its application is questionable. Its application for assessing the proprioception of the thoracolumbar spine should wait until new studies are conducted with more promising findings.

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The study was approved by the Ethics Committee of the Department of Physical Therapy at the University of Thessaly, Lamia, Greece (2378ΣΕ1/22-02-2022).

Reliability of shoulder external rotation position sense test in subjects with Adolescent Idiopathic Scoliosis

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ABSTRACT:

INTRODUCTION: The existence of proprioceptive deficits in individuals with adolescent idiopathic scoliosis compared to healthy adolescents has been studied and supported by the literature. From the review of studies, no reliability study was found for a tool that can be used to assess shoulder external rotation proprioception in scoliosis adolescents. The purpose of the study was to determine the test-retest reliability of the 45^0 angle of shoulder external rotation in subjects with adolescent idiopathic scoliosis.

METHODS: 15 subjects with adolescent idiopathic scoliosis (age: 14.3 ±1.5 years, main curve Cobb angle: 23.8 ± 5.56°) participated in the study and were evaluated by the same examiner with the movement repetition test aiming at 45^0 external rotations shoulder. The test was performed with eyes closed and from a supine position with knees bent. The shoulder under examination was in an initial position of 90^0 abduction and the elbow at a right angle also with an average forearm pronation-supination position. The inclinometer was placed on the ulnar styloid process. The examiner passively guided the participant's arm into 45^0 external rotation, maintaining the position for 5'' and asking the participant to memorize it. The participant was asked to repeat the movement afterwards and locate the angle of 45^0. The examiner measured in each repetition the difference from the actual angle in relation to the target. Small distances represented a small proprioceptive deficit. This procedure was repeated 5 times for each shoulder. It was preceded by an eyes-open habituation test. After the end of the whole procedure, exactly the same procedure was repeated by the same examiner at an interval of 15 minutes. Reliability of the test was assessed based on intraclass correlation coefficient (ICC), standard error of measurement (SEM) and smallest detectable difference (SDD).

RESULTS: Test-retest reliability was found to be poor for both absolute test error for the right [ICC (95% CI) = 0.18 (0 -0.71), SEM = 4.16, SDD = 11.54] and the left shoulder [ICC (95% CI) = 0.37 (0 -0.77), SEM = 3.59, SDD = 9.96 , as well as for the continuous error for the right [ICC (95% CI = 0.57 (0-0.86) SEM = 5.52, SDD = 15.31] and for the left shoulder [ICC (95% CI) = 0.59 (0-0.85) SEM = 5.19, SDD= 14.38].

CONCLUSIONS: The shoulder external rotation joint position sense test in subjects with adolescent idiopathic scoliosis appears to have low reliability. It is not recommended that therapists use this test to monitor the course of treatment for proprioceptive shoulder external rotation.

NON-PHARMACOLOGICAL INTERVENTION IN INDIVIDUALS WITH NEUROCOGNITIVE DISORDERS- THE EXAMPLE OF A CLINICAL TRAINING SITE

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INTRODUCTION: Dementia is a chronic or progressive syndrome that leads to deterioration of cognitive function, beyond the biologically expected effects of aging. Non-pharmacological interventions, such as physical and mental training, are practical approaches for the prevention and management of dementia and its predisposition[1] and are practiced in day care and counseling centers, by health professionals, including physiotherapists.

METHODS: The group programs, which are part of the clinical training institution of the Department of Physiotherapy of the University of West Attica (Athens Alzheimer Association), includes people who are predisposed to develop or already have an established neurodegenerative disease. First of all, a holistic assessment of their cognitive and functional capacity is carried out by a neurologist/psychiatrist, a neuropsychologist and a physiotherapist. Subsequently, the participants are divided into group A1 (prevention, without cognitive deficits), A2 (mild cognitive impairment), A3 (early dementia) and “Free Activities” (moderate and severe dementia). A typical intervention program includes physical and mental training, of 45 each, three times a week. The physical exercise consists of aerobic, strengthening, balance (Otago Exercise Program),

stretching and dual task exercises. Accordingly, mental exercise mainly practices visuospatial ability, attention, thinking and speaking, memory and executive function.

RESULTS: Physical exercise has a neuroprotective effect, as it focuses on the basic alternations that are established in the brain due to dementia, thus delaying cognitive deterioration and contributing to the management of possible neuropsychiatric symptoms.[2,3] Regarding functionality, it facilitates the activities of daily living, the risk of fall and minimizes sleep disturbances.[3] At the same time, mental exercise promotes neuroplasticity and slows down the decline of cognitive function.[1]

CONCLUSIONS: Non-pharmacological interventions can contribute to the prevention and management of neurocognitive disorders. This is achieved through the close cooperation between health care professionals, of which the physiotherapist is an important member. Therefore, the role of day care and counseling centers aimed at patients with neurocognitive disorders and their caregivers is deemed important and their work effective.

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THE EFFECT OF KINESIOTHERAPY ON CERVICAL MUSCULOSKELETAL SYMPTOMS OF FIGHTER PILOTS

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Keywords: Fighter pilots, flight-induced cervical disorders, neck pain, neck musculoskeletal disorders, exercise training

INTRODUCTION: During flying, fighter pilots are exposed to extreme working conditions (high G-forces in a combination of rotation, lateral flexion, and extension of the neck), which increase the risk of musculoskeletal injuries and disorders. 83% of fighter pilots experience chronic neck pain, while in the general population, the percentage is 37% (1-10). The flight-induced cervical musculoskeletal symptoms (F-ICMSs) are related to lack of concentration and readiness during the flight, reduced motor control, inability to perform maneuvers and landings, reduced flight hours, increased use of medical services, and early retirement (1-10). The purpose of the study is to review the existing literature for studies in which physiotherapy exercise programs (PTP) were used to treat F-ICMSs.

MATERIAL & METHOD: The literature review was performed on Pubmed and Scopus databases, using appropriate keywords: Fighter pilots, flight-induced cervical disorders, neck pain, musculoskeletal disorders, and exercise training. The selection criteria were: RCTs or clinical studies to be written in English language and to describe in detail the physiotherapy intervention. Reviews and meta-analyses were excluded.

RESULTS: 233 articles were initially identified; 20 were evaluated for eligibility, and finally, 10 of them were included in the present study. The implemented PTPs included various interventions: active exercises with the use of helmets with additional weight (1,2), resistance bands (4-9), hand weights (1,5,9), medical balls (9), trampoline exercises (3), and mechanical passive neck traction device (10). The outcomes showed that PTPs aimed at reducing pain (2,4-7,10), improving neck muscles' strength (1,3,4,8,9), volume (8), and endurance (1,9), increasing the range of motion (10) and the functionality (2,4,5) of the fighter pilots.

CONCLUSIONS: All PTPs were found to be effective in reducing F-ICMSs. However, further research is needed to fully clarify the pathomechanism and the optimal way to strengthen the muscle groups involved and design new exercise programs for fighter pilots.

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PILATES AND YOGA IN PREGNANCY

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INTRODUCTION: Exercise can have beneficial effects on pain, continence, childbirth and physical and psychological well-being during pregnancy. The aim of the study was to investigate the effects of Pilates and Yoga on pregnancy and childbirth.

METHODS: A systematic review of randomized clinical trials (RCTs) was conducted in PubMed, Cochrane Library, PEDro and Google Scholar, with the words: pregnancy, delivery, birth, labor, labour, Yoga, Prenatal Yoga, Pilates, Clinical Pilates. 450 articles were found. Fifteen had the selection criteria (published after 2013 and methodological quality score PEDro>4/10). Eight were related to the effect on analgesia, six on the duration of labor and five on mental health

RESULTS: The Pilates studies included a total of 181 people who followed a program of Pilates exercises that lasted 2 sessions/week, 30-60 minutes, for a period of 8 weeks. In the Yoga intervention groups the frequency ranged from 1-7 sessions/week, 30-60 minutes, over a period of 7-16 weeks with a total number of 335 people. The Pilates and Yoga groups had greater improvement in analgesia compared to the control groups (n_p=4/8,n_y=4/8). Pilates groups registered a reduction in the duration of the active phase of labor in the average duration of the second stage of labor and a difference in the mean total duration of labor (n_p=1/2), while yoga groups had a significantly shorter first stage, second stage and third stage of labor (n_y=2/6). Improvements were also seen in the mental health of pregnant women with both methods, specifically in depression indices (n_p=1/1, n_y=1/2), and anxiety-stress (n_p=2/2, n_y=2/3), and in sleep disorders in the Pilates groups (n_p=3/3).

CONCLUSIONS: Pilates and Yoga are effective and feasible methods of reducing pain in pregnancy and childbirth, reducing the duration of labor and improving the mental health of pregnant women before and after pregnancy.

PHYSIOLOGICAL CONTROL MECHANISMS IN MOUNTAIN BIKING

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INTRODUCTION: Mountain biking or mountain cycling is an Olympic sport as well as an enjoyable outdoor recreational activity. It is particularly demanding in terms of the physical and mental reserves needed to carry it out (it requires very good physical condition, endurance, balance, autonomy, but the most important thing is the cycling skills). Cross-country races are performed at an average heart rate close to 90% of maximum, which corresponds to 84% of maximal oxygen uptake ($\dot{V}O2max$). More than 80% of race time is spent above lactic acid threshold. Off-road cyclists spend most of their effort against gravity with high rolling resistance and isometric contractions of the arm and leg muscles necessary for handling and stabilizing the bike.

METHODS: In this work, an audio-visual parameterization of the Physiological control mechanisms of the human body during mountain biking is performed. More specifically, a special watch (smartwatch) is used to measure the cyclist's pulse and heart rate. Finally, the mechanisms that are activated in various systems during mountain biking will be presented.

RESULTS: In particular, the functions of the central and peripheral nervous system and the sensory organs, the musculoskeletal, respiratory and cardiovascular systems are parameterized. The correlations of the endocrine axes with energy production and the participation of the gastrointestinal, nephro-urinary, regulatory mechanisms of acid-base balance and electrolytes, the skin and hematopoiesis and the immune system are also developed.

CONCLUSIONS: Mountain biking can be considered a sport that pushes athletes to the limits of the human body's capabilities. Through this work, an understanding of the physiological control mechanisms and adaptations required to contribute to improved performance in mountain biking is realized and warrants further investigation.

THE EFFECTIVENESS OF LOW LEVEL LASER THERAPY (LLLT) ON PAIN, DISABILITY, PAIN THRESHOLD AND RANGE OF MOTION IN PATIENTS WITH THE MYOFASCIAL PAIN SYNDROME

A SYSTEMATIC REVIEW

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Introduction: Low power laser is a frequent therapeutic approach for the treatment of patients with myofascial pain syndrome. The aim of the present systematic review was to investigate the effectiveness of LLLT on pain, disability, pain threshold and range of motion in patients with myofascial pain syndrome.

Methods: A systematic literature review was performed in the databases PubMed: 1986-2023 and Google Scholar: 2004-2023. We selected randomized controlled trials performed in patients with myofascial pain syndrome and comparing the efficacy of LLLT at different wavelengths, with placebo or with another therapeutic approach. Data related to pain intensity, pain pressure threshold (PPT), range of motion (ROM), and disability were analyzed as a pooled estimate of the mean difference or standard mean difference (SMD) with a confidence interval (Cls) of 95 % using the random/fixed effect model. Included studies were assessed using the Pedro criteria and Egger's linear regression test was performed to examine the risk of study bias.

Results: A total of 16 randomized controlled trials were included in the present study. Pooled results showed that LLLT was statistically significant in reducing pain (MD= −1.29, 95% CI=−2.36; −0.23, P<0.001). Additional statistically significant results were in the reduction in pain threshold (SMD of 2.63, 95% CI=0.96; 4.30, P<0.01) and in increasing right neck flexion (SMD 3.44, 95% CI=0.64, 6.24, P<0.01). Finally, it appears that there was no statistically significant improvement in disability (MD of -7.83, 95% CI= -17.1; 0.08, P=1.34) after the use of LLLT.

Conclusions: LLLT appears to be able to reduce pain in patients with myofascial pain syndrome. The researchers suggest using LLLT with other therapeutic approaches such as manual techniques, acupuncture and exercise.

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CROSS-CULTURAL ADAPTATION OF THE GREEK VERSION OF THE SHORT VERSION OF THE ANTERIOR CRUCIATE LIGAMENT RETURN TO SPORT AFTER INJURY SCALE (ACL-RSI).

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Introduction: The Anterior Cruciate Ligament Return to Sport After Injury scale (ACL-RSI) was developed in order to evaluate the psychological readiness of athletes to return to sport after a surgical reconstruction of the Anterior Cruciate Ligament (ACL). The purpose of the present study was to translate and adapt the Greek version of the ACL-RSI questionnaire.

Method: After permission was granted in order to use the English ACL-RSI scale, the scale was translated and adapted to the Greek language, according to the international directives regarding intercultural adaptation in five stages: 1) forward translation by two translators, 2) composition of the questionnaire, 3) backward translation, 4) creation of the pre-final version of the scale and 5) pilot test of the pre-final version of the scale in a sample of 10 athletes following a surgical reconstruction of the ACL. Moreover, the evaluation of reliability and validity of the Greek translated scale ACL-RSI in athletes following 6-10 months after their surgical reconstruction of the ACL. In order to evaluate the reliability, a repeated measurements reliability check was conducted (test – retest). In order to evaluate the validity, the short version of Knee Injury and Osteoarthritis Outcome Score (KOOS) scale and the International Knee Documentation Committee (IKDC) scale were used.

Results: The process of translation and adjustment of the adaptation of the scale was conducted without any particular difficulties. The Greek version of ACL-RSI GR scale is ready for the evaluation of the psychological readiness of Greek athletes when returning to sport after ACL surgical reconstruction. The reliability and validity check of the ACL-RSI GR scale is in progress and the results will be presented during the convention, in order to include a maximum number of participants.

Conclusions: The Greek version of ACL-RSI scale is available to be used by health and sport scientists for clinical and research purposes. There should be further evaluation of the psychometric properties of the scale, which is in progress.

Keywords: Reliability, Validity, Intercultural Adaptation, Anterior Cruciate Ligament

REVIEW OF MODERN GUIDELINES FOR PATIENTS WITH LUMBAR SPINAL STENOSIS

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INTRODUCTION: Lumbar spinal stenosis (SS) is a slowly progressive degenerative condition. It is associated with a narrowing of the width of the vertebral foramina (spinal canal) and intervertebral foramina[1]. SS remains the most common diagnosis for adults over 65 years of age undergoing lumbar surgery[2]. The main type of SS is caused by degenerative arthritis, due to advanced age[3]. A characteristic symptom is neurogenic claudication, i.e. pain and neurological symptoms in one leg, mainly when walking, which subside when the patient sits. The diagnosis of SS is based mainly on symptoms and physical examination, rather than on imaging findings. It is important that the examiner associates neurogenic claudication with the patient's position (2). In SS the mobility of the entire spine is limited, especially lumbar extension in relation to flexion. The purpose of this paper is to review the current guidelines for the rehabilitation of lumbar spinal stenosis. To date, no similar review has been performed for current guidelines (2019 onwards) on lumbar spinal stenosis.

METHODS: The studies selected for the review met the following criteria: They are published in English and/or Greek, from 2019 to date in international peer-reviewed journals, they concern an adult population (18 years and older) with a confirmed diagnosis of lumbar spinal stenosis and they refer to guidelines for the rehabilitation of these patients. Two independent researchers performed a detailed search of the PubMed, PEDRO and EBSCO databases to obtain the studies selected for the review. Their references were additionally searched for relevant studies which may have escaped the initial search.

RESULTS: 6 articles were identified, which met the review criteria.

CONCLUSIONS: The guidelines for lumbar spinal stenosis recommend a multidimensional approach to rehabilitation, including patient education, lifestyle changes in terms of movement and nutrition, behavior modification techniques, manual therapy, individualized exercise programs and acupuncture. In case of surgical treatment, it is recommended that postoperative rehabilitation should be combined with cognitive behavioral psychotherapy.

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INTERESTING CASE STUDY OF AMPUTATION OF THE LOWER LIMB AND USE OF PROSTHESIS

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INTRODUCTION: The objective of the present study was to introduce an interesting case of a patient with a lower limb amputation at the mid-femoral level. In Greece, approximately 3000 amputations are recorded annually. Diabetic foot is considered a serious complication of diabetic patients and prevention is necessary as 70% of amputations worldwide involve diabetic peripheral neuropathy.

METHODS: After being informed about the case, English and Greek articles and literature were searched to find information about the physiotherapeutic approach to lower limb amputation. Our intervention consisted of 10 sessions in the physical therapy department of the hospital. A programme which maintained and increased strength and coordination of both lower limbs was implemented. An upper limb pedalboard was used to improve cardiorespiratory ability. The patient received training to correctly position the prosthetic limb and became familiar with its operating mechanism. Evaluation was performed through functional activities (gait and stair climbing on a treadmill with bars, dependence on physiotherapist).

RESULTS: The patient came to Lamia Hospital for scheduled physical therapies with the prosthetic limb. A detailed history was taken and a clinical examination was performed, which revealed that while the patient was aware that he had diabetes mellitus, he did not regulate his blood sugar well. The physiotherapy goals were education using the prosthetic limb and training in its correct maintenance, improvement in cardiorespiratory function, relearning how to walk and climb stairs (supported on the bars and supervised by at least two physiotherapists). Instructions were given, so as to take care of the other limb as a preventive measure.

CONCLUSIONS: Diabetic foot is a serious complication of diabetes mellitus worldwide, therefore regular monitoring of patients by specialists, good regulation of blood sugar, education of patients and establishment of diabetic foot clinics are regarded necessary. In amputee patients using an additional limb, physiotherapeutic intervention and monitoring can offer many benefits[1,2,3] and help improve their quality of life. Presence of physiotherapists in diabetic foot clinics is considered necessary.

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URINARY INCONTINENCE: PREVENTION AND TREATMENT THROUGH PHYSIOTHERAPY

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INTRODUCTION: This review objects to determine the means of prevention and physiotherapeutic treatment of urinary incontinence in men and women, gathering the possible methods and investigating their effectiveness. The aims of physical therapy are to increase the strength and endurance of the pelvic floor muscles, to improve neuromuscular coordination during the process of urination and continence and to improve urethral closure in order to reduce the occurrence of incontinence episodes.

METHODS: Material searched through PubMed, Google Scholar, PEDro, Cochrane, Elsevier, Physiopedia. The search was conducted between 2015-2021, but older references were also used. Search of keywords in Greek and English. Mainly systematic studies were selected, as well as some RCTs with interesting results of new approaches.

RESULTS: Physiotherapy can improve urinary incontinence and the patient's quality of life as a first-line treatment. PERFECT SCHEME is an important tool in the assessment of pelvic floor muscles' contractility, in combination with detailed medical history taking, bladder diaries and quality of life questionnaires. Kegel[1,2] (pelvic floor strengthening) exercises are the most popular and effective approach for both men and women. Clinical Pilates[3] combined with Kegel is effective. Efficacy of motor control[4], a modern approach that looks promising, is reported. Other methods (in combination with Kegel) include "Knack" maneuver training, bladder retraining and "Hypopressives". The synergy between pelvic floor muscles and core stabilization muscles is supported in some studies, but requires further investigation. Vaginal cones give better results than non-intervention, but due to the hygiene issue, they are not favored. Electrostimulation seems to have positive effects only in neurogenic pelvic floor disorders, whereas biofeedback mainly helps to identify pelvic floor muscles.

CONCLUSIONS: Physiotherapy has an important role in preventing incontinence by informing and motivating a greater number of people to seek assistance in order to improve their quality of life. Kegel exercises are considered the most effective therapeutic intervention. Further studies will help enhance the effectiveness of these methods and their widespread adoption by health professionals as an effective therapeutic tool.

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THE MOST EFFECTIVE KIND OF EXERCISE FOR ACHILLES TENDINOPATHY

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SUMMARY

INTRODUCTION

Achilles Tendinopathy (AT) is one of the most common tendinopathies of the lower limbs both in athletes and the general population. Conservative treatment includes medical and physical therapy treatment. Physical therapy options include electrotherapeutic / electrophysical means and manual therapy techniques. The purpose of this systematic review is to investigate the most effective kind of exercise used in AT rehabilitation.

METHODS

The search was performed by two researchers independently in the scientific databases Pubmed, Scopus, ScienceDirect and PEDro (1990-2023). The two researchers identified and assessed the studies which matched the inclusion-exclusion criteria. The third researcher was responsible for any previous disagreements.

To assess the risk of bias of the studies, the 12 criteria of Furlan, et al., (2009) were used. The evaluation of the effectiveness of the interventions was performed with the tool of research evidence of Van Tulder, et al., (2003).

RESULTS

Of the 1,938 studies identified, 5 met the inclusion criteria. Based on Furlan's et al., (2009) criteria all studies demonstrated low risk of bias (rates from 58-83%) and low levels of dropouts. The review identified three studies with eccentric- concentric protocols, one study with eccentric versus eccentric- concentric, and one study with eccentric protocol versus high-resistance exercises performed at a slow pace. Based on Van Tulder, et al., (2003), eccentric exercise presents strong evidence as the findings in these studies were positive and the studies presented low risk of bias.

CONCLUSIONS

This systematic review supports the eccentric exercise as the most effective in AT rehabilitation.

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THE EFFECTIVENESS OF HYDROTHERAPY IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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INTRODUCTION: Water exercise rehabilitation has been used widely in order to remedy musculoskeletal and neurological pathological conditions. Although hydrotherapy is not widely used in respiratory diseases and there are only a few studies based on Chronic Pulmonary Obstructive Disease (COPD). The present study is highly significant due to lack of systematic reviews.

METHODS: PRISMA guidelines and specific exclusion and inclusion criteria have been used for the present study. For the retrieval of randomized controlled trials were chosen specific data bases form May 2004 up to January 2023: PubMed and ScienceDirect, Google Scholar and Scopus using words and phrases such as: “COPD”, “hydrotherapy”, “aquatic therapy”, “aquatic exercise”, “balneotherapy”, “tap water therapy” and “spa therapy”. The reliable and valid PEDro scale was used in order to list the methodological quality of random surveys. The examined variables were “quality of life”, “exercise ability” and “function pulmonary”.

RESULTS: A flow chart showed five randomized controlled trials with the PEDro scale’s score of 5.8 (medium methodological quality). Four studies reported a quality of life improvement of patients with COPD, three studies a pulmonary function increase and two studies an exercise ability improvement. All randomized trials were of medium methodological quality. The participants followed a water exercise therapeutic program, that was applied approximately for 60 min, 3 times per week and for 3 months.

CONCLUSIONS: Hydrotherapy contributes in the improvement of exercise ability, pulmonary function and quality of life for COPD patients. However, taking into consideration the limitations of the studies, research is proposed through randomized controlled trials with the aim of confirming the effectiveness of hydrotherapy in patients of different degrees of COPD severity with or without other medical problems.

THE EFFECT OF TANGO ON DISEASE SEVERITY AND FUNCTIONAL MOBILITY IN ELDERLY PEOPLE WITH PARKINSONISM. A SYSTEMATIC REVIEW

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INTRODUCTION:

Parkinson's disease is very common among the elderly, causing severe gait and balance impairments. In recent years, therapeutic approaches incorporating tango dancing are applied with great frequency. The aim of this review is to study the effects of tango on disease severity and functional mobility in elderly patients with Parkinson's disease.

METHOD:

All data for this review were obtained from a combination of public databases, including PubMed, ScienceDirect, SprigerLink and PEDro. All selected clinical studies were published in the last 15 and included the keywords "Argentine tango OR tango AND Parkinson AND rehabilitation".

RESULTS:

This review includes twelve clinical trials, applied to a total of 424 elderly people with Parkinson's disease. All studies concluded that tango is safe and effective during therapy, while only one study found that treadmill exercises can be more effective than tango sessions when considering anterior gait parameters.

CONCLUSION:

There are very few studies examining the effect of tango on the rehabilitation of geriatric patients with Parkinson's disease. The results of this review suggest that tango has a positive impact on life quality, while it helps decrease disease severity and improves the mobility of elderly patients with mild to moderate idiopathic Parkinson's disease. Therefore, tango may be a fruitful approach if integrated into the clinical care of a patient's illness.

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EFFECTS OF HIPPOTHERAPY IN CHILDREN WITH CEREBRAL PALSY

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ABSTRACT

Introduction: Children with cerebral palsy present a variety of clinical features, mainly motor disorders, with a wide range of abnormalities such as poor balance and sensory deficits. Hippotherapy, through the three-dimensional movement of the horse and multiple environmental stimuli, is a method used for this specific population group and serves the needs of these children by improving motor, sensory and cognitive deficits.

Method: Articles were searched in Google scholar, PubMed, Medline, PEDro and Cochrane databases. Inclusion criteria were articles focusing on hippotherapy and involving only children with OP. 22 articles were included, which were separated and classified into groups.

Results: The results of the studies analyzed after the hippotherapy intervention in children with cerebral palsy showed an improvement in gross motor function, GMFCS scale scores, sitting ability, static and dynamic balance, gait, cardiorespiratory function, cognitive level and in their quality of life. Regarding muscle spasticity, a decrease in muscle tone of the hip adductors was observed. It was also found that the factors influencing gross mobility were the level of GMFM and that changes in dynamic balance were affected by the surface and the speed of the horse's gait.

Conclusions: Hippotherapy has a positive effect on the motor, sensory and cognitive level of children with OP and these adaptations seem to be maintained for a long time even after the end of the treatments.

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TRANSLATION AND CROSS-CULTURAL ADAPTATION OF AQUATIC FUNCTIONAL ASSESSMENT SCALE (AFAS) IN GREEK LANGUAGE

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INTRODUCTION: Hydrotherapy is one of the most widespread therapeutic approaches for people with various disabilities. Multiple investigations have proven the effectiveness of hydrotherapy, providing the need to investigate not only valid and reliable assessment tools but also effective therapeutic approaches. Assessment in water is essential to predict motor and functional skills, in order to choose the appropriate treatment program for each patient. However, the available assessment tools that are used in water in Greek language are limited. The AFAS scale (Aquatic Functional Assessment Scale-AFAS) evaluates the patient's motor behaviors and classifies adaptation and independence in the water. The purpose of this study was the translation and cross-cultural adaptation of AFAS scale in Greek language.

METHOD: First of all, we asked for the creator's license in order to translate the AFAS scale into the Greek language. The translation process was according to guidelines for the correct rendering of the scale in a different language, with the following steps: Two independent translators (a student and an expert in hydrotherapy terminology) translated the scale from English to the Greek language, then compared their translations in the presence of a third translator, expert in terminology and ended up in a common result. Two different translators, blind to the original version of the scale (a student and an expert in hydrotherapy terminology) translated the common result back into English language and ended up in their common result, in the presence of the same third translator, an expert in terminology. Subsequently, all the translators discussed the results and agreed to the final version of the scale in Greek language.

Results: There were specific terminologies, which have to be translated in the Greek language, so as to be understood and correctly applied by the clinical population. The purpose was to keep the meaning of the original scale, with respect to the creator, and

the translation, in order to be useful and functional in Greek language. The final result was the creation of the Greek version of the scale, which was unanimously considered to be appropriate for the Greek population.

Conclusions: During the translation and cross-cultural adaptation there were a few difficulties among the translators, that were unanimously solved by the research team. So, the final version seems to be an important tool for patients' functional assessment in water, which helps the therapist with the organization of a personalized therapy program. A further investigation of the validity and reliability of the tool is scheduled immediately.

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EXAMINATION OF THE RELATIONSHIP BETWEEN THE SATISFACTION, THE PAIN, THE FUNCTIONAL STATUS AND THE QUALITY OF LIFE DURING PHYSIOTHERAPY OF HOSPITALIZED PATIENTS FOLLOWING HIP SURGERY

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INTRODUCTION: Patient satisfaction may affect the goals of the rehabilitation process of hospitalized patients following a hip surgery. Physiotherapists can strengthen the quality of patient care by optimizing determinants satisfaction factors. The purpose of the present study was to examine the relationship between range of motion, muscle strength, postoperative pain, quality of life, functional status and patient's satisfaction during the physiotherapy program following a hip fracture surgery.

METHODS: This is a part of an ongoing study which has started in October 2022 and id going to conclude June 2023. The total sample will be 50 patients from the Orthopedic Clinic. The valid instruments are the goniometer, the Medical Research Council (MRC), the Visual Analogue Scale (VAS) of pain, the EuroQol -5D Quality of Life Questionnaire, the self-reported Patient Satisfaction Scale, the Greek version of Harris Hip Score. Assements were made before starting the physiotherapy program (1st assessment), on the day of discharge (2nd assessment), at 4 (3rd assessment) and 12 (4th assessment) postoperative weeks. Participants received a physiotherapy exercise session daily by the same physiotherapists, lasting 30 minutes each. The physiotherapy program included range of motion, muscle strength, balance, gait and functional ability exercises. The present study was approved by the Bioethics and Ethics Committee of General Hospital of Laconia and University of Peloponnese

(UoP), Governor of the 6th Health Region of Peloponnese – Ionian Islands – Epirus and Western Greece on 31/11/2022 for UoP (Protocol Number 61563/8.10.2022).

RESULTS: Eight patients were excluded. The sample consisted of 5 men and 11 women with a fracture hip with a mean age of 82.13 years (SD=11.56), with an 11.43 days average stay on hospital (SD=3.38) and with an average of 5 physiotherapy sessions performing daily (SD=1.89). The sample showed high satisfaction in relation to the health service provided on the day of discharge (M=8.95, SD=1.21). Satisfaction was statistically significantly correlated with trial "Stairs" ($r=-.80$, $p<0.05$), with "Usual activities" ($r=.92$, $p<0.05$), with "Your health today" ($r=-.91$, $p<0.05$), with "Pain" (VAS) ($r=-.56$, $p<0.05$), and with "Sitting ability" ($r=-.88$, $p<0.05$). Also, satisfaction had statistically significant correlations with lower extremity joint range of motion and muscle strength of the healthy and the injured limb. Statistically significant correlations were also found among the other variables. They were not found statistically significant differences in the pain, the range of motion, the muscle strength and the quality of life between the 1st and the 2nd assessments.

CONCLUSIONS: Satisfaction, pain, range of motion, muscle strength, functional status and quality of life were related in patients during physiotherapy program following a hip fracture. The small sample of the study is a limitation to draw conclusions. A larger sample is needed to conclude about the relationship of the aforementioned variables during the physiotherapy program following a hip fracture surgery.

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THE EFFECTIVENESS OF A RESISTANCE AND STABILIZATION-BASED EXERCISE PROGRAM ON PAIN INTENSITY AS WELL AS KINESIOPHOBIA IN PATIENTS WITH CHRONIC NON-SPECIFIC LOW BACK PAIN.

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INTRODUCTION: Chronic non-specific low back pain is a condition that plays a leading role in causing disability. It has been identified as the most common non-contagious disease, affecting the psychosocial aspect of the patient, beyond the musculoskeletal. Due to the chronic pain that is caused, it leads patients to develop kinesiophobia that affects their daily life. Chronic low back pain, is defined as a pain that lasts 12 weeks and over, appears in the loin area, under the ribs and above the inferior gluteal folds, with or without the onset of pain in the lower limbs. The gold-standard of intervention on those patients, according to the articles, is presumed to be the application of a program that includes resistance and stabilization exercises. Therefore, it is prudent to investigate the results of an intervention type that combines these two methods listed above, consisting of specific resistance and stabilization exercises, for this multidimensional disease.

METHOD: The study took place in private institutions in Athens. The sample size that was collected was 25 patients with an average age of 20-65 years, consisting of males and females. Firstly, pain and kinesiophobia were assessed with specific valid and reliable questionnaires (NPRS, TSK). Then, the sample executed a specific program, consisting of resistance and stabilization exercises for the time period of 6 weeks. After the 6 weeks, the two parameters were re-evaluated with the same tools. Lastly, the data was collected and processed using the SPSS program. Inclusion criteria: Age ≥ 18 years old, existence of non-specific pain in the loin, chronic pain lasting ≥ 3 months, no surgery in the wider waist and abdomen in the last 12 months, good use of the Greek language, good cognitive function.

RESULTS: The integration of the two rehabilitation methods presented positive results in reducing pain and kinesiophobia, for the sample that performed the recommended exercise program for 6 weeks. Statistically significant difference was observed in the improvements of both parameters. For the pain parameter SG was p=0.000 and for kinesiophobia p=0.004 in the total sample.

CONCLUSIONS: In conclusion, the use of a combination of resistance and stabilization exercises, significantly help to combat pain as well as kinesiophobia in patients with chronic non-specific low back pain. Finally, it should be mentioned that such exercises are useful to be included in the daily life of these individuals.

AMYOTROFIC LATERAL SCLEROSIS AS AN EXAMPLE FOR NEW TEACHING METHODS

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INTRODUCTION: Amyotrofic Lateral Sclerosis is the third most frequent neurodegenerative disorder, after Alzheimer and Parkinson, affecting 1/100.000 people annually. Men, especially of the Caucasian race are more vulnerable to this disease and it mainly appears during the ages of 50 to 75 years.

METHODS: Within the frame of our Physiology subject, ALS was initially used as a disease model in our presentation, in order to examine the possibility of using different learning methods, particularly modern audiovisual aids (video) as well as traditional methods, such as the simple presentation of slides.

More specifically, a group of students of the Physiotherapy class of the University of Thessaly was randomly divided. To the first group a short video was shown. The video included information about ALS. On the other hand, the second group was presented a power point with similar information about the disease.

RESULTS: Regarding ALS, there is the possibility to use a variety of learning methods, both modern audiovisual aids and traditional ones such as slides.

CONCLUSIONS: Through our research, we managed to prove that there is the possibility to use new methods in learning and teaching about diseases such as ALS, something that can contribute in the better understanding of their mechanisms, without this replacing the traditional methods but functioning in a helpful way to them.

CURRENT PERCEPTIONS REGARDING THE EFFECT OF LOAD IN TENDON

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INTRODUCTION:

Therapeutic exercise is globally recognized and scientifically proven of its effects. However, its benefits depends on the type of injury and the type of the exercise. In tendinopathies the literature indicates that heavy loading via resistance training is crucial for improving patient's function and decreasing the patients' pain. Still It is not clear how effective it is, basically because of the chronicity of the tendinopathies and the difficulties of understanding the underlying mechanisms. The purpose of this review is to understand the parameters of loading needed for creating a plan of therapy, to understand the effect of on tendon loading macro- and microscopically, taking into consideration the functional differences of them and the role of muscles as force producers.

METHOD: Research was done to find articles on the following topics: 1) Composure, structure and differences of tendons, 2) physiological procedures such as mechanotransduction, 3) the characteristics and the effect of loading, 4) pathophysiology of tendinopathy and the effect of exercise, 5) regeneration of pathological tissue of tendons via resistance training.

RESULTS:

It was found from systematic reviews[1] that healthy tendons adapt to high loading changing mechanical, material and morphological properties. It seems to not apply in pathological areas of tendons[2,3] at least for the specific types of exercise that were used (eccentric and heavy slow resistance training). In contrast to the aforementioned, a case study4 found structural changes and improved clinical image, in the pathological area of the athlete's patellar tendon with the use of MRI after a program that used high load, isometric contractions for 18 months.

CONCLUSION:

Loading with resistance exercises is one of the most reliable tools a physiotherapist can

use to improve patients function. It is necessary to know the parameters of it, the stage of pathology[3] and the differences between tendons to create a suitable rehabilitation plan. At the same time, more research is needed to understand the non-uniform stress that might occur when the tendon is loaded in vivo, the possible connection of it with pathology and our hypothesis that muscle inhibition might be the reason of stress-shielding[4].

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THE VALIDITY OF THE HANDHELD DYNAMOMETER FOR ASSESSING ECCENTRIC HIP ABUCTOR STRENGTH

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INTRODUCTION: Hip abductor strength plays an important role in the clinical examination of the lower limb. Specifically, eccentric strength is associated with various hip and knee pathologies. The handheld dynamometer is a tool that even though its reliability and validity has been excessively researched for assessing isometric and concentric hip abductor strength[1], very few studies report its validity when assessing eccentrically. Our objective was to examine the validity of the handheld dynamometer when assessing the eccentric hip abductor strength with the break test.

METHODS 46 asymptomatic and physically active women were tested by 2 independent assessors using handheld dynamometer during the hip abductor break test. Their eccentric strength was also assessed with an isokinetic dynamometer at 60^{o}/s angular speed which was the reference dynamometer as it is considered the gold standard tool.[2]

RESULTS: There were small but not statistically significant correlations between the normalized data of the handheld dynamometer and the Mean Peak Moment of the eccentric strength when it's evaluated at 60°/sec (r=0.18, p=0,20).

CONCLUSIONS: The handheld dynamometer when assessing hip abductor strength with the break test does not have an acceptable concurrent validity with the isokinetic dynamometer when evaluating eccentric hip abductor strength at 60^{o}/s. Our results are contradicting Brindle et al., 2018.[3] Future studies evaluating the hip abductor strength at different angular speeds and with a different sample may find better results for measuring hip abductor strength with a handheld dynamometer.

Ethics ref number 840-07/09/2022

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"THE ASSOCIATION BETWEEN THE FUNCTIONAL CAPACITY OF COMMUNITY-DWELLING OLDER PEOPLE AND THE RISK OF FALLS"

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ABSTRACT

INTRODUCTION: Falls are a common problem observed in the elderly and can lead to injuries that can be very dangerous for their health. Functional decline in the elderly is considered to be a major risk factor for falls. The aim of this study is to investigate the association between older people's history of falls and fear of falling with their functional capacity.

METHODS: Data were collected from 30 community-dwelling older adults aged 65 years and older who had experienced a fall in the past 12 months. The following tools were used: the Falls Efficacy Scale International (FES-I) questionnaire to detect fear of falling, and functional ability levels were assessed using the following clinical tests, Timed up and Go (TUG) to assess functional mobility, 6-Meter walk test (6MWT) for walking speed, 5-Times sit to stand (FTSST) for rising ability and Mini-BESTest to assess balance.

RESULTS: Older adults' fear of falling had a moderate correlation with functional mobility ($r = 0.58$, $p<0.01$), walking speed ($r = 0.55$, $p<0.01$), rising ability ($r = 0.46$, $p<0.05$) and balance ($r = 0.54$ $p<0.01$). There was also a moderate to strong correlation of falls that occurred a total of 12 months before with functional mobility ($r=0.68$, $p<0.001$) and walking speed ($r=0.77$, $p<0.001$), while there was a moderate correlation of these episodes with rising ability ($r=0.39$, $p<0.05$) and balance ($r=-0.50$, $p<0.01$). Falls occurring in the last 3 and 6 months had no statistically significant correlation with functional ability in the elderly ($p>0.05$). For episodes of falls in the last 12 months, statistically significant predictors were gait speed and rising ability ($R=0.82$, $R^2=0.67$, adjusted $R^2=0.62$, $p<0.001$) rather than functional mobility and balance ($p>0.05$). While, non-statistically significant was the prediction model including fear of falls ($p>0.05$).

CONCLUSIONS: It appears that the fear of falling experienced by elderly people who have fallen in the past is directly related to their levels of functional capacity. Furthermore, the identification of gait speed and rising ability as predictors of future episodes of falls may suggest possible directions in the therapeutic approach of older adults to reduce the incidence of falls.

Approval of the study: The study was approved by the Research Ethics Committee of the University of Thessaly.

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Chester step test has maximum physiological exercise responses in young men and women. Comparisons with the incremental shuttle walk test.

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Introduction: In clinical practice, the evaluation of exercise capacity is performed by using functional tests that simulate daily activities, such as walking. These tests, however, require room for their implementation, a fact that often makes them difficult in the clinical setting. The Chester Step Test (CST) is an incremental intensity step test that assesses the exercise capacity, imposing on maximum body load. The aim of the present study was to investigate whether the CST is capable of assessing functional capacity and cardiorespiratory responses in young men and women, as well as to be compared to the cardiorespiratory responses induced by the Incremental Shuttle Walk Test (ISWT).

METHOD: At baseline, 24 inactive young participants (10 males) (mean age: 22±3 years), were evaluated for body composition and other anthropometric characteristics. They performed the ISWT and CST tests in random order with 30 minutes of rest, apart. Values are presented as mean ± SD. Paired t-test was used for the comparison of the physiological parameters between the two functional tests. The significance level was set at $p<0.05$.

RESULTS: Participant's characteristics: BMI: 23.9±4.7 Kg/m2, Free fat mass: 52.1± 3.9 Kg, Muscle mass: 48.3±11 Kg, Fat mass: 19.4±7.5 Kg and Fat (%): 27.3±6.6. A correlation was found ($r=0.518$, $p=0.009$) between the distance covered in the ISWT and the total number of steps in the CST. At the end of each test, the maximum heart rate was higher in CST compared to ISWT (178±16 vs 161±18 beats/min, $p<0.001$), while systolic (SBP) and diastolic (DBP) blood pressure did not differ between tests (SBP: 138±20 vs. 137±19 mmHg and DBP: 76±10 vs 75±11 mmHg). Leg fatigue differed between tests (Borg scale: CST 3.6±1.9 vs ISWT 5.2±2.2 units, $p=0.001$).

CONCLUSION: CST imposes greater heart rate responses and leg fatigue in young inactive people compared to walking tests, such as the ISWT.

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Study Approval: The study is part of an independent research study which was approved by the Ethics Committee of the physiotherapy department, University of Thessaly (1170/9-11-2022).

THE EFFECT OF HAMSTRING DISTENSION ON THEIR MAXIMUM ISOMETRIC STRENGTH AND EXPLOSIVENESS

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Introduction: Hamstrings are one of the most common muscle groups in many contact and non-contact sports that get injured in different level athletes. Their flexibility is one of the main risk factors, however there is not any clear data on the effects their strength and explosiveness have, which are two of the main factors on athletes' performance. Assessing and reviewing the effects they have using easily applicable tests, may benefit our clinical practice by providing a useful control tool. The aim of this study is to review the effects of the hamstrings flexibility on their maximal isometric strength and explosiveness.

Methods: An observational study was done on students of the physical therapy department. The protocol of the Sit-and-Reach test which had been previously described for research purposes, was used to measure hamstring flexibility in 31 healthy college students. Then a five-minute warm up was performed and followed by isometric dynamometry tests of knee flexion and vertical jump with prestretch (Countermovement Jump) in a randomized order. The test's data were descriptively analyzed with the help of IBM SPSS 29.0 and the correlation between the flexibility and the test was checked via Spearman.

Results: A total number of 31 participants was assessed, consisting 14 men and 17 women with an average age of 19.5± 1 years. 93.5% of participants stated that their dominant lower limb is on their right side. The results of strength and CMJ of men were larger than women's, showing a statically significant difference (p=0.01). However, flexibility was increased in women compared to men but there is no statistically significant difference (p=0.149). The dominant limb was the strongest both in women and in men, while increased results of strength had larger CMJ. Finally, there was no statistically significant difference between SaR and the two tests the participants did (CMJ:p=0.337, HHD:p=0.181), but a negative linear relation was noticed between SaR and handheld dynamometry on men (rs=-0.741, p=0.002).

Conclusions: Reduced flexibility of the hamstrings may contribute to impaired muscle strength, which may be due to their increased tension (stiffness). Further research may inform the individuals on where this occurs in conjunction with other performance parameters that may be affected by it.

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Study Approval
Internal Ethics Committee of the Physiotherapy Department

RELIABILITY OF INTEGRATED TREADMILL H/P COSMOS PLUTO MED FOR GAIT PARAMETERS

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INTRODUCTION: Physiotherapists often analyze gait parameters in clinical level for plenty medical cases. Therefore, the existence of a tool that evaluates gait parameters in a reliable way is necessary. The instrumented treadmill H/P cosmos Pluto Med measures force, pressure and spatiotemporal parameters while standing, walking or running. This study aims to assess the intra-day and inter-day reliability of gait parameters while using this treadmill.

METHODS: 24 healthy volunteers (14 Women / 10 Men) with an average height of 171 cm (± 8.2) and an average weight of 69.7 kg (± 14.4), ages between 19 and 29, participated in the study. The participants performed treadmill gait analysis, wearing running shoes, at a walking speed of 5 km/h, for 4 minutes. Three trials were conducted, twice on the first day with one hour interval between them (intra-day reliability), and once one week apart (inter-day reliability). The Intraclass Correlation Coefficient (ICC), Standard Error of Measurement (SEM), and Smallest Detectable Difference (SDD) reliability and measurement error indexes were calculated.

RESULTS: Spatial parameters, such as step length, revealed excellent intraday reliability with small measurement error (ICC = 0.98- 0.93; SEM = 0.50– 0.85; SDD = 1.9%- 3.2%). The analysis also showed high reliability for ground-pressure parameters with relatively low measurement error. Specifically, maximum ground pressure on both legs revealed ICC = 0.97- 0.9; SEM = 0.80– 1.10; SDD = 14.5%- 19.9 %. For inter-day measurements the reliability indexes yielded similar results for both spatial (ICC= 0.94; SEM= 0.8– 0.76 και SDD= 3.3%- 2.9%) and ground-pressure parameters (ICC= 0.97– 0.94; SEM= 0.73– 0.9 and SDD= 13,4%- 16.3 %) on both legs.

CONCLUSIONS: For most of the examined gait parameters at the instrumented treadmill H/P cosmos Pluto Med, the results demonstrated excellent inter-day and intra-day reliability with ground-pressure parameters yielding higher measurement error than spatial parameters. Therefore, at both research and clinical levels, the H/P cosmos Pluto Med treadmill is a valuable tool for evaluating gait parameters.

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STUDY APPROVAL: This study was approved by the Internal Ethics Committee of the Physiotherapy Department, Protocol number: 9, Lamia 10-1-202

THE EFFECT OF PELVIC FLOOR MUSCLE TRAINING IN URINARY INCONTINENCE IN WOMEN DURING PREGNANCY AND POSTPARTUM: A SYSTEMATIC REVIEW AND META-ANALYSIS

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INTRODUCTION: Urinary incontinence (UI) is one of the most common complications during or after pregnancy. The application of Pelvic Floor Muscle Training (PFMT) is the first line of treatment. The aim of this systematic review was to investigate the effectiveness of PFMT in treating urinary incontinence in women during pregnancy and postpartum.

METHODS: An article search was conducted in PubMed, Cochrane Library, and Scopus. The search language was English and the keywords used were: "urinary incontinence", "pelvic floor muscle training", "prevention", "antenatal", "pregnancy", "postpartum". The inclusion criteria for the articles were to be randomized controlled trials (RCTs) of the last decade. Based on the PEDro scale, their methodological quality needed an overall score of 6/10 and above.

RESULTS: Ultimately, a total of six studies fulfilled the inclusion criteria. The total score for methodological quality was 6/10 for three and 7/10 for the other three studies. In all the studies, the participants were women either during pregnancy (N=70-855) or postpartum (n=84, one study) and were randomly allocated to an intervention or a control group. In the intervention groups exercise programs with emphasis on pelvic floor muscles were applied, while in the control groups there was no intervention other than regular care. From a meta-analysis of the outcome measure “Number of women with UI” irrespective of severity, at the end of the gestation

period (36^{th} -38^{th} week) from five studies and one postpartum study after the therapeutic intervention, the odds-ratio, OR=0,54, in total was statistically significant (Z=4,87, *p<0,0001*), indicating a reduction in the number of participants with UI following the application of PFMT therapeutic programs. However, this result must be confirmed through more studies as the heterogeneity index among the included studies (I^2=79%) was rather high.

CONCLUSION: In most studies, pelvic floor muscle training (PFMT) was effective in relieving UI symptoms during pregnancy and postpartum. However, further investigation into both the short-term and long-term effects of PFMT on UI is recommended.

THE LIFE AND WORK OF FLORENCE NIGHTINGALE.

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INTRODUCTION : The purpose of the presentation is the route of Florence Nightingale and her emergence as a leader of nursing science. During her project she was asked to face several difficulties through which she managed to achieve her dreams and expectations. Florence NIGHTINGALE is considered the first woman who managed to establish nursing as a profession and at the same time, through her knowledge of statistics and the prevalence of the method of antisepsis, she won the world's respect and admiration. Finally, she established methods and standards for better management of patients in hospitals, and of the hospitals themselves, thus contributing to the creation of a decent health care system.

METHODS: In order to achieve the above, bibliographic sources were used with simultaneous search in the digital engines Scopus and PubMed. Information gleaned from books and articles was analysed, facts and information cross-referenced to provide as comprehensive a view of her life and work as possible.

RESULTS: In this work we briefly present the life and work of Florence Nightingale as well as her contribution through her deeds and actions to the establishment of Nursing as a science recognized by all.

CONCLUSIONS: The British Florence Nightingale went down in history with the nickname "The Lady with the Lantern". She was a pioneer of modern nursing, with an important work of social reformation of nursing institutions throughout the world.

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CORRELATION OF ANTHROPOMETRIC, DEMOGRAPHIC AND CLINICAL HEMODYNAMIC PARAMETERS WITH FUNCTIONAL CAPACITY THROUGH THE SIX MINUTE WALKING TEST IN PATIENTS WITH TYPE 1 DIABETES MELLITUS: INITIAL FINDINGS

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INTRODUCTION: The Six Minute Walking Test (6MWT) is a reliable and valid method of assessing functional capacity in patients with type 1 diabetes mellitus (T1DM) [1-3]. The aim of this pilot study was to correlate anthropometric and clinical factors with the performance on 6MWT in patients with T1DM.

METHOD: A sample of 8 patients (75%men) with T1DM aged 18-65 (37 ±18 years) participated in the study. Anthropometric parameters were registered, medical history was taken and a nicotine dependent questionnaire was completed (Fagerström). The 6MWT was completed in a 30 m indoor straight track where the: a) total distance walked in m (6MWD) b) hemodynamic parameters [systolic and diastolic blood pressure (SBP and DBP), heart rate(HR)] and c) subjective assessment of effort using the Borg Scale where recorded. The statistical analysis was accomplished with the SPSS program (vs.26.0) with a statistical significance level of $p<0.05$.

RESULTS: The following characteristics of the sample were brought out through descriptive statistics (age; M=36.87±17.54 years, BMI: M=25.789±3.052kg·m^{-2}, HbA1c: M: 7.36±1.125%). The average distance walked was 462,46±41,26m. Due to the size of sample, a following non-parametric testing of data brought out many statistically significant positive correlations between HR 1' after the test and the 6MWD (rs=0.714, p=0,047), the type of smoking (rs=0.949, p=0.014) and Glycated Hemoglobin[(HbA1c) (rs=0.873, p=0.005)]. Moderate negative, non-statistically significant, correlations observed between gender and HR 1' after test and 6MWD (rs=-0.504, p=0.2). In addition to, highly positive statistically significant correlations observed between Fagerström scale and SBP in rest (rs=0.900, p=0.037) and between SBP after 6MWT (rs=0.900, p=0.037) and HR 1' (rs=0.900, p=0.037).

CONCLUSIONS: Factors like gender and type of smoking may affect functional capacity. Women with T1DM are expected to travel a longer distance at 6MWT than men with T1DM. Also, 6MWD seems to positively affect hemodynamic parameters and patients with better performance have higher numbers in HR 1' after 6MWT. Increased nicotine dependence raises hemodynamics parameters such as HR and SBP. There were no statistically significant correlations between anthropometric characteristics of patients with T1DM and functional capacity, because of the small sample.

Key words: Diabetes Mellitus, Functional Capacity, Six Minute Walk Test, 6MWT

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Study Approval:

1. Ethics Committee of the Physiotherapy curriculum of the University of Thessaly (no. 1373/19-12-2022)

2. Scientific Council of the General Hospital of Lamia following a registered request with protocol number: S1436/23-1-22023

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THE EFFECT OF SOCIODEMOGRAPHIC CHARACTERISTICS OF PATIENTS WITH CORONARY ARTERY DISEASE ON THE INTENTION TO PARTICIPATE IN CARDIAC REHABILITATION PROGRAMS

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INTRODUCTION: One of the main causes of mortality and morbidity worldwide is Coronary Artery Disease (CAD).[1] Cardiac Rehabilitation (CR) is proposed as a method of its secondary prevention.[2,3] However, despite the proven benefits of CR, participation rates are low. Several scales have been created to identify barriers to patients' participation in CR. The most widespread of these, whose validity and reliability have been proven, is the Cardiac Rehabilitation Barriers Scale (CRBS).[4,5] The aim of the present research was to study the effect of the sociodemographic characteristics of CAD patients on the barriers to participation in CR.

METHODS: In a sample of 110 adult patients with coronary artery disease (88.2% men, aged 65.3±10.2 years), after angioplasty intervention in Phase II CR, was given the Greek version of the CRBS scale, which includes 4 subscales-factors for categorizing CR obstacles. The degree of influence of gender, age, distance and educational level on the barriers to CR was investigated. Statistical analysis was performed using the Stata 13.1 statistical package.

RESULTS: Through the non-parametric test X^2 statistically significant differences were found between gender and the mobility difficulties ($\chi^2 = 11.74$, $p<0.05$) and the distance and i) the cost ($\chi^2 = 25.0$, $p<0.05$) and ii) the mobility difficulties ($\chi^2 = 11.1$, $p<0.05$). Additionally, statistically significant differences were observed in educational level and i) cost ($\chi^2 = 16.3$, $p<0.05$), ii) the belief that exercise is tiring or painful ($\chi^2 = 20.7$, $p<0.05$), etc. Furthermore, through the analysis of variance (One-way ANOVA) statistically significant differences were found between age and i) distance from the center ($F_{(4, 105)} = 4.11$, $p<0.05$), ii) frequent trips ($F_{(4, 105)} = 2.84$, $p<0.05$), etc.

CONCLUSION: Sociodemographic characteristics of patients show differences in barriers to CR and seem to influence the intention and ultimately the decision of CAD patients to participate in a CR program. Therefore, it is recommended to evaluate them for the drafting

of a CR program by clinical therapists, as well as their further future investigation, in a larger sample and from other cities.

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Study approval

1. Ethics and Ethics Committee of the Physiotherapy study program of the University of Thessaly (prot. no. 130/08-02-2022)
2. Scientific Council of the PPGN of Larissa following a recorded application with protocol number: 14922/07-04-22

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FACTORS CONTRIBUTING TO FALLS IN THE THIRD AGE

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INTRODUCTION: According to the World Health Organization, by 2050 the elderly will account for 1/3 of the world population. With increasing age, various mental and physical changes occur, which are not only due to old age but are mainly the result of dysfunction or disease from diseases or from the influence of harmful environmental factors combined with reduced mobility. Falls are a major problem with medical, economic and social consequences. They are the leading cause of accidental deaths and the seventh cause of accidental deaths in people over 65 years of age. The number of falls increases with age in both sexes in all nationalities and races. The purpose of this review is to investigate the risk factors for falls in the elderly.

METHODS: Pubmed and Scopus databases were searched on 29-31/01/2023 and 09/02/2023. The keywords used were "falls", "elderlypeople", "riskfactors" and "qualityoflife". Fifty-one articles were retrieved, of which 15 met the review's entry criteria.

RESULTS: Falls in older people are caused by a multitude of factors which can be divided into two main categories, exogenous and endogenous, with immediate and long-term consequences for the individual, the family and public health. Exogenous causes account for 41%-55% of falls in people living in their own homes and 16% of those living in nursing homes. In addition, the length of stay in institutions, the time of day they occur, the characteristics of the caregivers of the elderly are associated factors of falls.

CONCLUSION: The effort of the scholars and data from related research, which clearly needs further investigation, focuses on predicting falls, not just preventing them. Programs of empowerment and also training of elderly people by a multidisciplinary team appropriate counselling and support for the elderly by various

institutions will be a cornerstone in the prediction and prevention of falls. Technology and the application of telehealth could also minimize falls to a large extent.

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TRANSLATION AND CULTURAL ADAPTATION OF THE EARLY CLINICAL ASSESSMENT OF BALANCE TEST

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INTRODUCTION:

Balance is defined as the ability to maintain the center of body mass within a normal base of support. In cerebral palsy, this mechanism is absent or deficient. This is due to impaired control of the trunk and head as a result of the disorder. Various tests and scales such as the Pediatric Berg Balance Scale[2] and the Berg Balance Scale[3] have been used to assess balance, and are already available in Greek language. The Early Clinical Assessment of Balance (ECAB) test assesses balance control in sitting and standing position in children aged from 1.5 to5 years. The purpose of this study is initially the translation and cultural adaptation of the test into Greek language, by following the international guidelines, and afterwards the evaluation of it's reliability through patient's assessment and reassessment.

METHOD:

Before starting the translation into Greek, we needed to obtain approval from the official translators of the test, which is already reliable and valid in English language. The translation process was based on the guidelines for the proper rendering of the scale in another language, by using the following steps: Two independent translators, translated the scale from English to Greek, then compared their translations in the presence of a third translator, specialized in terminology, and they ended up at a common result. This final result, was given to two other independent translators, who translated it back into English without knowing the original version, and arrived at their own common result, again in the presence of the same third translator. After that, all the translators met to discuss the different conclusions and agreed on the final version of the scale in the Greek language.

RESULTS:

There was a specific terminology that had to be translated into Greek in order to be comprehensible and correctly applicable by the clinical population. The goal was to maintain the meaning of the original scale, always with respect to the creator. The results showed that the translation of the ECAB test was adapted to Greek without any significant difficulties between the two translators.

CONCLUSIONS:

During the translation and cultural adaptation process, there were minimal difficulties among the translators which were unanimously resolved by the research team. The final form, appears to be easily applicable, comprehensible, and a useful tool in the hands of clinicians. The ECAB scale and it's results are accessible to Greek therapists for both evaluation and use in treatment planning. In the future, the validity and reliability of the test will be detected.

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STUDY APPROVAL:

For this study, ethics committee approval was not necessary as it did not involve any interventions.

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PERCEPTIONS AMONG GREEK CARDIAC SURGEONS ABOUT PREOPERATIVE PHYSIOTHERAPY IN CARDIAC SURGERY. A QUALITATIVE STUDY.

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BACKGROUND: Cardiovascular diseases are high in prevalence and danger globally limiting patients' functional capacity and quality of life driving them even to death. The ways to deal with complications and improve the quality of life are categorized as invasive and non-invasive. Among the non-invasive ways, physiotherapy is included. Reviewing the literature, the value of prehabilitation is high for patients' health but concerns are aroused about the percentage of patients that participate in these programs due to potential low referral by cardiac surgeons. The aim of this study was to investigate the Greek cardiac surgeons' attitudes and perceptions about preoperative physiotherapy.

METHODOLOGY: The study was qualitative and conducted through semi-structured individual interviews (duration 40-60 minutes) through 19 open-ended questions. The questions concerned knowledge about prehabilitation and the proposed clinical guidelines, the outcomes, the obstacles, and ways to enhance patients' participation. The content of the questions was elaborated after discussion and consensus by specialists (physiotherapists and cardiac surgeons). The triangulation methods (two interviewers, confirmation of answers by participants) enhanced the validity. Inclusion criteria were: professional experience in cardiac surgery for more than a year in Greece.

RESULTS: The sample consisted of 22 (2 women) cardiac surgeons aged 51±8 years with a mean professional experience of 21±9 years. The main sources of information about prehabilitation were cardiac surgeons' clinical environment (36%) and education (36%). 40% were not informed about the clinical guidelines of scientific societies and 95% declared that prehabilitation has positive outcomes pre and post-operatively, with the most common being the improvement of pulmonary function (56%). Concerning the patients' referral to prehabilitation, 45% did not refer patients due to economic problems (45%) and a shortage of facilities (20%). According to them, the ways to enhance the patient's referral, are the improvement of facilities (32%), defrayal (27%), and doctors' and patients' awareness (23%).

CONCLUSIONS: Greek cardiac surgeons have incomplete information about preoperative physiotherapy despite the knowledge about patients' benefits derived from the programs. Patients' referrals to prehabilitation programs will be reinforced with increment of resources.

«THE THERAPEUTIC EFFECT OF VIRTUAL REALITY IN ADULTS WITH NEUROLOGICAL DISORDERS»

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INTRODUCTION:

Neurological disorders are the leading cause of death and disability, affecting more than 1 billion people worldwide leading to an estimated annual cost of 266 billion euros in Europe.[1] Rehabilitation interventions last more than the foreseen due to the loss of the patient's interest for participation in treatment or to lack of human resources and technological means. [2] Virtual reality is a technological advancement impacting cognitive research, evaluation and rehabilitation,[3] providing patients the ability to interact within realistic visual environments that resemble everyday life activity[1].

METHODS:

An electronic search of MEDLINE databases (via PubMed) was performed, Scopus (via Elsevier) and the Cochrane Database of Systematic Reviews that used the keywords: "virtual reality", neurorehabilitation* and adult* with a time limit from 2020 to 2022. The inclusion criteria were (a) only randomized controlled trials (RCTs) in adults over 18 years of age, (b) only studies using virtual reality as a stand-alone therapeutic intervention and/or combined with conventional physiotherapy; and (c) only studies published between 2020 and 2022 in English. Studies that a) did not refer to neurological conditions, and b) did not use scales or tests to assess the progress of the participants.

RESULTS:

Out of 105 studies only thirteen (13) met the inclusion criteria. In detail, 11 studies demonstrated statistical significance, 6 positive benefits and 6 no apparent benefits between control and intervention groups. All included studies included scales or scaled tests to assess participants' abilities. None of the studies presented a negative effect of virtual reality between groups.

CONCLUSION:

Virtual reality is an adjunct therapeutic intervention technique that can contribute in improving the motor and functional abilities of people with neurological disorders. Research focused on neurological pathologies such as multiple sclerosis, Parkinson's disease and stroke. Further research on the effectiveness of its use in different neurological populations is considered necessary.

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ΑΝΑΦΟΡΕΣ

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BIP Course on Neurological Physiotherapy by the Department of Physiotherapy of the University of Thessaly, the University of Savonia and Applied Science of Finland and the University of Charles in Prague.

E.M Kalligeri, A. Kanellopoulou, P Kitixis, G.M. Kyriakatis, S. Pentsi, Ch. Pliakas, E. Zioga, Z. Zachariadis, Th. Besios

The Department of Physiotherapy of the University of Thessaly participated in the BIP Course on Neurological Physiotherapy, through Erasmus+. It took place in Kuopio, Finland on February 20-24, 2023, and was attended by the Department of Physiotherapy of the University of Thessaly, the University of Savonia and Applied Science of Finland, -where we were hosted by- and the University of Charles in Prague. The coordinator of the project was Mrs. Marja Äijö of the University of Finland, Mr. Thomas Besios was in charge of the Greek participation and Mrs. Kamila Řasová oversaw the Czech team. The Greek team consisted of 2 assistant professors, Mr. Thomas Besios and Mr. Zacharias Dimitriadis and 7 undergraduate students. The aim of the program was the acquisition and intercultural exchange of knowledge about neurological physiotherapy, as well as the cooperation between students. During our stay, we took a tour of the premises of the University of Finland, had the opportunity to utilize virtual reality equipment, attended lectures by professors. We visited the LIVE, which is a private neurological rehabilitation center, mainly for patients after stroke. Also, we attended a "neuro dance" course at the Music Center, where we were given the chance to participate. From the Greek side, the lecture of our professor T. Besios concerned the development and operation of the CNS in the context of physiotherapeutic intervention and Mr. Z. Dimitriadis focused on the effects of spasticity resistance exercises in patients with neurological disorders. In addition, we visited the research laboratory of robotics and virtual reality in neurological rehabilitation of the University of Eastern Finland and demonstrated gait analysis with cameras and adaptation of driving in neurological patients. At the same time, assignment, and presentation of papers in mixed groups oriented to physiotherapeutic intervention in neurological patients took place. In fact, the articles we wrote, were published in a local scientific magazine in Finland. In conclusion, the intercultural approach of the blended mobility program gave students the opportunity to exchange views on dealing with neurological cases, to meet different education systems and was a trigger for further deepening in neurological physiotherapy.

Collaboration of Occupational Therapists and Physiotherapists in the Effective Rehabilitation of Stroke

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Abstract. Health is a fundamental right of every human being and the promotion of health an uninterrupted and important therapeutic process. During the recovery process from a traumatic event, the individual's health declines, and to return to a functional level, there should be a collaboration of a multidisciplinary team for the best possible outcome. The present paper tries to "separate" but also to "unite" two different, but at the same time, similar health disciplines, Occupational Therapy and Physiotherapy, that work together for the rehabilitation of a Stroke. Both above-mentioned branches perform a function, a social condition, and an evidence-based practice with the goal of quality inclusion of the patient in contexts where he feels safe and functional. Physiotherapy focuses on the resumption of the individual's motor dysfunctions, while Occupational Therapy focuses on the better use of motor patterns with the aim of social and community integration of the individual in activities he used to enjoy. Successfully redefining the individual's goals in society requires careful reasoning and emphasizes the values, norms, interests, preferences, and meaning that the individual ascribes to his daily life. Therefore, therapists need to approach the person and their caregivers holistically, creating an intimate and collaborative climate, as well as the opportunity for more effective therapeutic practices together with the person/caregiver. Thus, with a deep understanding of client-centered practice, therapists are the reference persons of the beneficiary, identifying their areas of action to create a supportive environment for the optimal process of health promotion. Finally, it is legitimate for the perfect cooperation of the two branches, without overlapping therapeutic roles, for the beneficiary to feel safe.

Key words: Physiotherapy, Occupational therapy, stroke, collaboration, health promotion.

EXPLORATION OF THE SENSITIVITY OF WOTA II SCALE IN DETECTING FUNCTIONALITY IN WATER IN HEALTHY POPULATION WITH OR WITHOUT SWIMMING EXPERIENCE

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INTRODUCTION:

Hydrotherapy is widely used in rehabilitation of people with neurological disorders and other impairments. Both the properties of water and the motivation it provides to individuals, make it an important part of rehabilitation. There are various scales to evaluate functionality and adaptation in the aquatic environment (SWIM, WOTAI&II, HAAR). The primary aim of this study is to investigate whether WOTA II scale can detect adaptability and functionality in water in healthy population. Additionally, a conclusion of clinical importance is whether swimming ability and patient's gender can affect the results of the scale.

METHOD:

The sample of the pilot study consisted of 12 people aged 18-24 years old. One group consisted of those who had taken swimming lessons and the other of those who had not. All participants were evaluated outside the water with Berg Balance Scale to assess their ability on land and there were assessed in water with WOTA II as well. The evaluation with Berg and WOTA II was performed in a suitable adapted space. The water temperature was stable at 34 degrees and the depth at 140 cm. The study took place at the facilities of the HAQL lab, at the University of Thessaly.

RESULTS:

The results of the pilot study were analyzed with the Statistical Package for the Social Sciences (SPSS) software. From the sample (N=12), a statistically significant correlation was found between height and walking quality (p=0.003), with Pearson correlation : 0.776. Statistically significant differences were found between genders in relation to overall performance score, with males having higher scores than females (p=0.008). There were no statistically significant differences in overall performance score between swimmers and non-swimmers (p=0.521). Descriptive data showed that the average score for the frontstroke was higher than other styles of swimming in individuals who had taken swimming lessons (mean=2.67, backstroke=1.5, frontstroke=3).

CONCLUSIONS:

The Berg Balance Scale showed absolute ability of the participants on land. The WOTA II test was found to be sensitive even in healthy population, indicating that in patients, the previous ability should be taken into account and the total inability should not be attributed completely to the given pathology. Men appeared to have better performance compared to women. Frontstroke was the highest rated style in individuals without swimming ability. Breathing activities were demanding for both groups. The height of was correlated with the quality of walking.

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STUDY APPROVAL:

The study was approved by the internal ethics committee of the University of Thessaly.

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CORRELATION OF ANTHROPOMETRIC AND CLINICAL HEMODYNAMIC PARAMETERS VIA INCREMENTAL SHUTTLE WALK TEST (ISWT) IN PATIENTS WITH DIABETES TYPE I : INITIAL FINDINGS

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INTRODUCTION: The Incremental Shuttle Walk Test (ISWT) is used to assess functional capacity in people with type 1 diabetes mellitus (DM1).[1-3].The aim of this pilot study is to correlate the effect of anthropometric and clinical parameters with functional capacity in individuals with DM1 using the ISWT.

METHODS: Eight patients (75% men) with DM1, aged 61±18 years, were enrolled in the study. A history was taken (recording of glycosylated hemoglobin, fasting blood glucose value, insulin administration route and smoking-related information), anthropometric characteristics were measured [sex, age, Height, Weight, Body Mass Index (BMI), Waist/Hip circumference] and cardiovascular parameters [heart rate (HR), systolic and diastolic blood pressure (BP)], and then the ISWT test was performed. The latter was performed on an indoor treadmill by having the patient walk back and forth between two cones, 10m apart, at increasing speed through an acoustic stimulus. The procedure was terminated if the participant stopped or did not reach the cone before the beep. During the procedure, HR and SpO2 were recorded using an oximeter at the designated time. At the end, reasons for stopping, HR and BP were recorded and the Fagerström nicotine dependence rating scale was completed. Data analysis was performed using SPSS (25.0) statistical software.

RESULTS: Through descriptive statistics, the following sample characteristics, were highlighted, such as age: M=36.87±17.54 years, BMI: M25.789±3.052kg/m2 and HbA1c: M: 7.36±1.125%. The mean distance travelled in ISWT was 617.5±219.72 meters. Non-parametric testing of the data followed due to a small sample size highlighting statistically significant positive associations between insulin and recovery time (rs=0.756, p=0.03), HbA1c to glucose (rs=0.735, p=0.038), smoking type (rs=0.949, p=0.014), smoking (rs=0.873, p=0.005). A positive statistically significant correlation between Fagerström scale and HR1' after ISWT (rs=0.975, p=0.005) appeared. Analysis of variance (ANOVA) indicated a statistically significant effect between recovery time [F(2, 7)=7.76, p=0.029].

CONCLUSIONS: There is a positive correlation between insulin and recovery time. There is a positive statistically significant correlation between smokers and non-smokers (Fagerström scale) and HR after one minute of cessation.

Key words: Diabetes mellitus, Incremental Shuttle Walk Test (ISWT), Functional Capacity

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Study Approval:

1. Ethics Committee of the Physiotherapy curriculum of the University of Thessaly (protocol number 1373/19-12-2022)

2. Scientific Council of the General Hospital of Lamia after a recorded request with protocol number: Σ1436/23-1-22023

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THE EVALUATION OF THE EFFECTIVENESS OF A TELEREHABILITATION PROGRAM ON THE FUNCTIONAL CAPACITY IN CORONARY ARTERY DISEASE PATIENTS

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KEY WORDS: Cardiovascular Rehabilitation, Cardiovascular telerehabilitation, tele-monitoring, coronary artery disease patients, coronary disease, Covid-19, functional capacity

INTRODUCTION: Coronary artery disease is the leading cause of death world-wide.[1] Cardiovascular rehabilitation (CR) can reduce mortality rates and improve the quality of life of coronary patients through individualized exercise and counseling.[2] However, CR participation rates are very low.[3] Telerehabilitation is presented as an effective alternative type of CR provision that can increase participation rates. [4-6]

OBJECTIVE: The purpose of this study was to investigate the effectiveness of a telerehabilitation program on the functional capacity, muscle strength and rates of compliance of coronary disease patients.

METHODS: A sample of eight (8) patients with coronary artery disease was used, randomly divided into two groups of four (4) individuals: experimental telerehabilitation group (TELE-CR) and control group (CG). The supervised exercise intervention lasted a total of six (6) weeks. CG participants did not attend any intervention At baseline, all participants (TELE-CR and CG) were evaluated in terms of their anthropometric characteristics, functional capacity, muscle strength of the lower limbs, anxiety and depression levels. At the end of the intervention (A_6) the initial assessments were repeated. Statistical Package for Social Sciences (SPSS) V.25 was be used for all data analyses.

RESULTS: No statistically significant differences were revealed for the functional capacity, the lower extremity muscle strength, the levels of anxiety and depression between the TELE-CR and the CG. Compliance rates were assessed as excellent.

CONCLUSIONS Although the telerehabilitation in coronary patients doesn't appear to be effective, factors such as the short duration of the intervention, the small sample size and the initial heterogeneity of the sample in functional capacity may have influenced the final results of the present study. Tele-rehabilitation may be a promising way of implementing CR. Though it needs further investigation.

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THE EFFECT OF THE PULSED HIGH INTESITY LASER THERAPY (HILT) ON THE BLOOD FLOW OF THE PERIARTICULAR TISSUES OF THE KNEE JOINT

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ABSTRACT:

The purpose of this research study was to investigate the effect of the pulsed High Intensity Laser Therapy (HILT) on the speed of the blood flow as well as on the blood (arterial) pressure of the periarticular tissues of the knee.

METHODS:

28 healthy adult individuals, 16 males with a mean age of 45.88 ± 9.7 years and 12 females with a mean age of 39.08 ± 7.55 years, participated in the study, who were randomly divided into two (2) groups. The first group (n=14) received treatment with HILT, while the second group (14 people) underwent placebo Laser application. In the first (HILT) group, the biostimulation protocol of the device was applied: Frequency 20Hz, Energy density 1170J/cm^2 and a total energy of 1160Hz in the tissues, via a probe with a 5mm diameter, and a spot of 0,2cm^2 through manual scanning on the quadriceps surface[1].

Blood flow measurements before and after the intervention were performed with a Doppler ultrasound, which also recorded the values of the blood pressure in the deep femoral artery.

RESULTS

The data analysis showed that both the speed of the blood flow and the blood pressure revealed statistically significant increase in the intervention group. The results didn't

show statistically significant increase in the control group (placebo HILT) neither for the speed of blood flow nor for the blood pressure. Comparing the two groups (HILT group/placebo HILT group) after the intervention, the results showed that there was statistically significant increase in the intervention group regarding the speed of the blood flow. However, the results revealed marginally not significant difference regarding the blood pressure of the deep femoral artery.

CONCLUSIONS:

In conclusion, HILT seems to increase the speed of the blood flow in the periarticular tissues of the knee, and is recommended as a cost-effective, non-invasive and painless treatment. Due to the limited research of the above variables, further future research is considered necessary.

Key Words: High Intensity Laser Therapy, HILT, Doppler Ultrasound, Knee Disorders, LLLT, Physiotherapy

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COMPARISON OF NEUROMUSCULAR AND ABDUCTOR STRENGTHENING EXERCISES IN THE KINEMATICS OF THE KNEE: A RANDOMIZED CONTROLLED TRIAL.

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Introduction: Dynamic knee valgus (DKV) can cause several knee injuries (e.g. ACL injury, meniscus tear, and patellofemoral pain). Physical therapy treatment usually includes hip abductor exercises or neuromuscular coordination exercises with positive results in reducing pain, however, their effect on knee kinematics and muscle strength is unclear. The aim of this study was to investigate the effectiveness of 6 weeks of progressive training resistance training (RPT) compared to a neuromuscular training (NMT) program in functional performance in healthy women as measured by the Single Leg Landing (SLL) and Single Leg Squat (SLS) tests. A secondary purpose was to find changes in hip abductor muscle strength.

Methods: 52 asymptomatic women (age 20.31 ±1.11 years) were randomly divided into two groups: NMT (n=26) and PRT (n=26). The participants were assessed at baseline and after the intervention. Functional performance was assessed through the SLL and SLS tests. The DKV was measured at the maximum tibiofemoral angle of the coronal plane during the SLL and the SLS using the Kinovea application. The evaluation of the concentric and eccentric contraction of the hip abductors was done with isokinetic BIODEX at 60°/s at baseline and after 6 weeks.

Results: Statistically significant differences were found between the variables for each group with effect sizes ranging from moderate to extremely strong. Results of the two-way mixed ANOVA statistical tests showed that they existed statistically significant interactions of time with intervention group in terms of SLS (time $p<0.001$; group $p>0.05$; time*group $p<0.001$) and the SLL (time $p<0.001$; group $p>0.05$; time*group $p<0.01$) and non-statistically significant interactions regarding the concentric 60°/s (time $p<0.001$; group $p>0.05$; time*group $p=0.33$) and the eccentric 60°/s (time $p<0.001$; group $p>0.05$; time*group $p=0.83$).

Discussion: A 6-week NMT improves the dynamic knee valgus better than a PRT.

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Αριθμό πρωτοκόλλου έγκρισης της μελέτης:840

Reliability of Upper Extremity Functional Proprioception Test in Patients with Adolescent Idiopathic Scoliosis

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ABSTRACT

INTRODUCTION: Proprioceptive disorders in patients with adolescent idiopathic scoliosis have been studied. The findings support the existence of proprioceptive deficits in individuals with adolescent idiopathic scoliosis compared to healthy adolescents. From the literature search, no reliability study has been found for a tool that can be used to assess upper extremity proprioception in scoliosis adolescents. The aim of the study was to determine the reliability of an upper extremity functional proprioceptive test in patients with adolescent idiopathic scoliosis.

METHODS: 15 subjects with adolescent idiopathic scoliosis participated in the study (age: 14.3 ±1.5 years, main curve Cobb angle: 23.8±5.56°) and were evaluated by the same examiner with the functional proprioceptive test of the upper limbs. The test was performed with eyes closed and from a sitting position. At shoulder height in front of the participant was a transparent surface with 8 holes. In random order, the index finger of one hand was placed in the hole from under the transparent surface. The participant was asked to locate with the index of the other hand, from the top of the transparent surface, the exact position of the index of the hand that was previously placed in the hole. The examiner measured the distance between the participant's 2 pointers each time. Small distances represented a small proprioceptive deficit. This process was repeated 3 times for each of the 8 holes. The same measurements were made for both hands. After the end of the whole procedure, exactly the same procedure was repeated by the same examiner at an interval of 15 minutes. The reliability of the test was assessed based on the intraclass correlation coefficient (ICC), standard error of measurement (SEM) and smallest detectable difference (SDD).

RESULTS: Reliability was found to be good to excellent for both the total test score [ICC (95% CI) = 0.90 (0.71-0.96), SEM = 0.47, SDD = 1.3], and individually for the left [ICC (95% CI) = 0.86 (0.40-0.91) SEM = 0.47, SDD = 1.3] and for the right upper limb [ICC (95% CI) = 0 .87 (0.63-0.95) SEM = 0.67, SDD= 1.87].

CONCLUSIONS: Upper extremity functional proprioceptive testing in subjects with adolescent idiopathic scoliosis appears to be reliable. Therapists who would like to evaluate the course of treatment in terms of upper extremity proprioception could make use of this test.

INVESTIGATION OF PROPRIOCEPTIVE REPLICATION ABILITY OF MEDIUM JOINT ANGULAR VELOCITIES IN THE KNEE JOINT IN A HEALTHY POPULATION

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ABSTRACT

INTRODUCTION: The proprioceptive perception of joint angular velocity and its replication have not been studied in contrast to proprioceptive perception and reproduction of joint position, which have been extensively investigated in both healthy and pathological populations.[1] The aim of the present research is to investigate the proprioceptive ability to reproduce low-to-medium angular velocities in the knee joint in a healthy population.

METHODS: The Biodex System 3 pro isokinetic dynamometer was used in 43 subjects (23 men and 20 women, mean age 20.84 years) to test the proprioceptive reproduction ability of 30°/s, 45°/s, 60°/s, 75°/s and 90°/s in the knee joint, and any error was measured. Five demonstration trials followed by five reproduction trials took place, in randomized order, with subjects wearing a mask and blinded to the results, as were the investigators. The signal was smoothed with an 80ms Moving Average Filter and the mean velocity of the last 3 of the 5 repetitions was calculated.

RESULTS: The subjects reproduced each angular velocity with statistically significant error, except that of 30°/s. The error was incrementally increasing as the angular velocity increased. The highest angular velocity of 90°/s showed the most significant error, both in absolute value (34.9°/s) and as a percentage (38.8%) of the tested velocity, and 30°/s the smallest (6.0°/s and 20.0%, respectively).

CONCLUSIONS: As the joint angular velocity increases, and the brain cannot be informed on time about the joint velocity and is forced to predict it, the reproduction error increases. This fact needs further investigation for possible correlation with muscle injuries at high joint angular velocities.

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INVESTIGATION OF THE AGREEMENT BETWEEN REMOTE ASSESSMENT AND IN-PERSON ASSESSMENT USING 4 FUNCTIONAL TESTS IN CHILDREN WITH CEREBRAL PALSY

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INTRODUCTION: Social distancing during the pandemic has accelerated the use of remote physiotherapy due to its ability to overcome service access barriers and provide continued care. However, little is known about the validity and reliability of functional assessment in children with cerebral palsy (CP) using synchronous forms of telehealth.

METHODS: This study aimed to investigate the agreement between remote assessment using synchronous forms of telehealth and in-person clinical assessment for four functional tests. The tests were the 5-Times Sit-to-Stand Test (FTSTS), The Timed Up And Go Test (TUG), the Lateral Step Up Test (LSU), and the Pediatric Balance Scale (PBS). All tests are reliable for assessing balance and mobility in children with CP in face-to-face clinical practice. A convenience sample of 11 children (7 boys) aged 6-11 years, with CP and GMFCS level I and II, was used. Each participant performed all four functional tests in both conditions. The in-person assessment took place in a private physical therapy clinic, and then the remote assessment was performed at home, using VSee videoconferencing software, 2 days apart. All assessments were performed by the same physical therapist.

RESULTS: The tests were performed safely and successfully in both experimental conditions. The degree of agreement between the two conditions was confirmed by Bland-Altman analysis.
The reliability of the measurements in both conditions was investigated and high correlations were found for the TUG (ICC 0.932), the LSU (ICC 0.967), and PBS test (ICC 0.997). A moderate correlation was for the FTSTS (ICC 0.754).

CONCLUSIONS: Remote assessment using the FTSTS, TUG, LSU, and PBS functional tests is feasible, valid, and reliable for independently mobilized children with CP.

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"What are the immediate effects of a myofascial release technique of the diaphragm on thoracic mobility and chest expansion on Brazilian jiu jitsu competitive athletes? A crossover pilot study."

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INTRODUCTION: On Brazilian jiu jitsu fighting sport, in high level competitions the frequency of injuries on thoracic cage reaches up to 25% of all injuries of the body. An important parameter for reducing the frequency of those injuries is flexibility of the spine, thorax and hamstrings. A satisfying level of flexibility can help the athletes performing offence and defense techniques in a more effective way, especially under circumstances of extreme physical pressure. On the same time, the diaphragm constitutes one of the main thoracic and breathing muscles. It is believed that contributes on better and more stable posture of the spine. Thus, taking into account all the above the **purpose** of this crossover pilot study is to investigate the possible effect of applying a myofascial release technique of the diaphragm on spine flexibility and thoracic expansion.

METHODOLOGY: Fourteen (14) volunteers Bjj athletes (4 female, 10 male) of age 18-48 years old (33,6+/_ 17,4) participated in this study. They were all subjected to a myofascial release technique of the diaphragm and to a sham technique with random order and pause interval of 14-15 days (between the two interventions). Before and after application of each intervention there were measured from the same examiner the following: a) range of motion (ROM) of the thoracic flexion and extension with bubble inclinometer, b) chest expansion in two different levels (Th5- 3rd intercostal space and Th10-xiphoid process), c) Fingertip to floor test (FTF) and Modified-Modified Shober's test (MMST). All measurement outcomes had been previously tested for intra-rated reliability.

RESULTS: There was statistically significant improvement ($p>0,05$) after the myofascial technique intervention in all the measurement outcomes with differences 1,4cm and 1,9cm on upper and lower chest respectively, 0,4cm on MMST, 3,9cm on FTF test and 5,5 – 5,40 on flexion and extension Thoracic ROM. On the contrary there was no statistically significant differences after the sham intervention on any of the measurement outcomes ($p>0,005$).

CONCLUSIONS: The myofascial release technique of the diaphragm appears to be helpful on spine flexibility and chest expansion, at least for a short time of period.

Research approval: Morals & Ethics Committee University of Patras (prot. No. 15204).

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THE ROLE OF ACTION OBSERVATION THERAPY IN THE REHABILITATION OF NEUROLOGICAL DISORDERS: Literature Review

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ABSTRACT

INTRODUCTION: Neurological patients can experience either primary or secondary deficits, which make the individual's activities of daily living difficult. Action Observation Therapy (AOT) is a method of rehabilitation, where the patient first observes, through video imaging, an activity and then performs the movement he observed.[1]

The purpose of this literature review is to search for studies in which the AOT has been applied in the rehabilitation of neurological disorders and to explore possible benefits that will

make AOT an independent method of neurorehabilitation the next years.

MATERIALS & METHODS: In this study, the effectiveness of AOT in Stroke, Parkinson's Disease and Cerebral Palsy was investigated in detail, through the research collected.[1] The studies were searched in scientific databases, such as PubMed and ResearchGate, using the words "Neuroscience", "Neurology", "Neurological Disorders" and the phrase "Action Observation Therapy", as among many other terminology that existed, this was considered to be closer to the therapeutic context and the science of physiotherapy.

RESULTS: The results of the above studies showed that AOT has moderate to high benefits in the ability and speed of walking and performance in activities of daily living of people with Stroke,[2] leads to improved results in typical motor symptoms and functionality of patients with Parkinson's Disease,[3] as well as inhibition of spasticity, improved grip strength, unilateral quality of movement and spontaneous movement of the Upper Limbs, in children with Cerebral Palsy.[4]

CONCLUSIONS: AOT has shown positive results in almost every study, but there is definitely a need for further investigation. AOT qualifies as an adjunctive rehabilitation technique, cost-effective and time-consuming,[1] even in the short term, however it can in no way directly replace conventional rehabilitation and the methods that have been applied and researched for their effectiveness for decades.

Key words

Action Observation Therapy, Mirror Neurons, Neuromuscular Deficits, Neurorehabilitation

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TRANSLATION AND CROSS-CULTURAL ADAPTATION OF TRUNK CONTROL MEASUREMENT SCALE (TCMS) IN GREEK

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INTRODUCTION: It is well known that trunk control is one of the main factors in performing daily activities. Many studies have reported on the importance of trunk control and how it affects people's lives daily. The Trunk Control Measurement Scale (TCMS) is a scale created for pediatric patients to assess static and dynamic balance in a sitting position. The purpose of the present study is the performance of the scale (TCMS) in Greek. The scale describes 15 items, five involving static balance, seven the selective motor control and three dynamic approach. Static balance has a maximum score of 20, selective motor control's maximum score is 28 and dynamic approaches maximum score can be 10. The total maximum score a patient can receive is 58.

METHODS: Two researchers (AT, EM) with excellent knowledge of the English language, one with little and one with extensive experience in translational research, participated in the translation of the trunk control measurement scale from English to Greek and with the help of a third researcher (KC) they ended up in the Greek test, which was given to two other researchers. These researchers (AA, AK), one with extensive and the other with little experience in translational research and both with excellent knowledge of the English language participated in the translation of the scale from Greek (target language) to English (original language), without they have knowledge of the original English version, and they came up

with a common English test with the help of the same third researcher (KC). Then the five researchers met together and compared the English translation with the original and made the required changes for the final form of the Greek version.

RESULTS: There were difficulties in translating several words. Some of them were the words item, en block and shuffle. These words are rendered differently in the two languages. Effectively, the research team made adjustments for some of them in order to facilitate the semantic coherence of the scale but at the same time not altering the concepts of the original version. After comparing the English translation with the scale, the necessary adjustments were made in order to reproduce the scale as faithfully as possible in the Greek language.

CONCLUSIONS: The trunk control measurement scale is a tool that was rendered with satisfactory results in the Greek language. It is expected to be a useful tool for the evaluation of trunk control for Greek physical therapists. In a future study, the validity and reliability of the Greek version will be investigated.

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DOLPHIN THERAPY, AN INNOVATIVE THERAPEUTIC INTERVENTION: A REVIEW

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INTRODUCTION: Dolphin therapy is an innovative, evolving branch of therapy for children with disabilities and psychological disorders. It is a branch of animal therapy that uses the dolphin as a therapeutic agent and appears to have significant benefits especially for children. The purpose of the review is to study the effectiveness of dolphin therapy.

METHODS: Two researchers independently searched at Google Scholar, PubMed, and Cochrane. A third researcher assessed the articles resulting from the search by the first two researchers. Twelve articles were found to meet the relevant criteria from which eight articles were selected, some of which were common to both researchers. The keywords used in the searches were: Animal assisted therapy, Dolphin assisted therapy, cerebral palsy and mental health.

RESULTS: In the existing research on dolphin therapy and the intervention in different patient groups, there are many methodological problems regarding the homogeneity of the sample, the intervention program, the intervention time as well as the long-term follow-up. Research in this particular field seems to be facing difficulties. From the present review it has been found to be an effective complementary therapy that has effects mainly on the psychology of children. It has been found to increase brain function in children during treatment[1]. Also, therapy using dolphins has been

found to be more effective than therapy with other animals in improving communication skills[2]. In addition to these two main results, research has shown that dolphin therapy helps to deal with anxiety and depression in children with various conditions. No studies were found for adults or studies where patients had negative results from the use of dolphin therapy.

CONCLUSIONS: All investigations concluded that further research is needed in this area with specific intervention protocols, more homogeneous population and duration of intervention.

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EVALUATION OF THE EFFECTIVENESS OF KINETIC CONTROL EXERCISES (KCE) IN PATIENTS WITH LOW BACK PAIN REGARDING FUNCTION AND PAIN USING THE PEDro SCALE.

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INTRODUCTION: In recent years, Kinetic Control Exercises (KCEs) have been a useful rehabilitation tool in chronic non-specific low back pain (NSCLBP)[1,2]. The purpose of this review was to evaluate the methodological quality of research, through PEDro, of KCEs in patients with NSCLBP, compared to other therapeutic interventions, no intervention or minimal intervention and with KCEs as a secondary adjunct to other therapy.

METHODS: Online searches of PUBMED, COCHRANE & PEDRO were performed. Quasi-randomized and Randomized Controlled Trials (RCTs) were selected, which examined the effectiveness of KCEs in patients with NSCLBP. Two independent authors (G.G & I.P) reviewed the search results, assessed the methodological quality of the selected studies and qualitatively extracted their data. A third author (PT or AM) resolved any scoring disagreement. The methodological quality was graded with the *10-point PEDro scale*[3] and the level of *scientific documentation*, according to the *Sackett classification*[4]. The results were *pain intensity*, *disability*, f*unction*, *general perception of recovery (Global Impression of Recovery)* and the *quality of life (Quality of life)*. Furthermore, the *follow-up stages* were defined as follows: short-term (<3 months), medium-term (3-6 months) and long-term (>6 months).

RESULTS: The search of the databases initially yielded *896* trial RCTs, of which initially *31* were selected, after evaluation, for full-text assessment and finally 18 studies were selected, which met the eligibility criteria, (*n=1430* patients with NSCLBP). A total of *94%* of the studies were evaluated with good to excellent (*PEDro Score:* 6-8 and 9-10 respectively) methodological quality, which percentage was representative for *96%* of the participants *(n=1382)*. In the short term, KCEs appears to be superior to general exercise in terms of pain, limitation and level of function, while there is a strong level of evidence that KCEs is not clinically more effective than other exercises in the medium to long term.

CONCLUSIONS: In terms of pain & functionality, KCEs seem to have better short-term therapeutic efficacy in patients with NSCLBP compared to other therapeutic methods (general exercises, etc.). However, in the medium and long term, this therapeutic effect seems to be attenuated.

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