



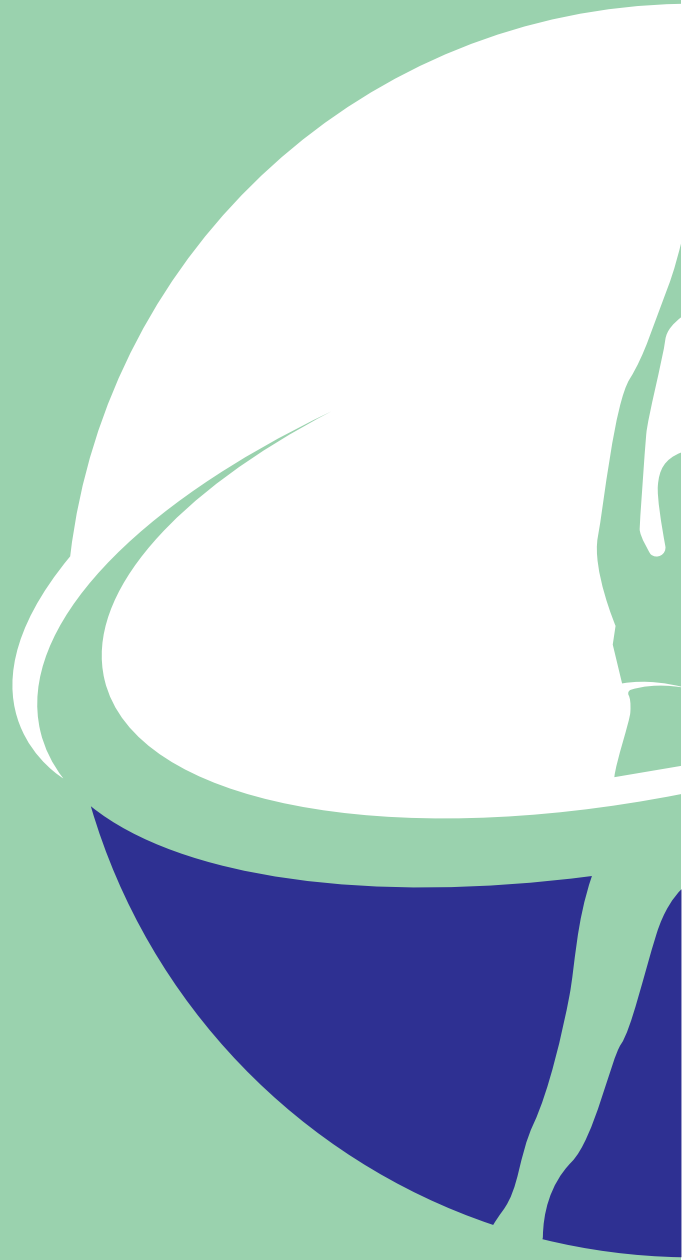
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# “PHYSIOTHERAPEUTIC EXERCISE TO SPECIAL SCHOOL ADOLESCENT STUDENTS WITH INCREASED BMI, TO IMPROVE BALANCE AND JUMPING SKILLS.”

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## ABSTRACT

### Introduction

Bronchial Asthma is a frequent disease in children and young adults, characterized by airway obstruction caused by bronchial hyperresponsiveness. The condition can be cured with the use of bronchodilators or can be healed naturally, by applying Respiratory Physical Therapy (PT) in both cases.

### Purpose

This research was developed in the "Pediatric Physiotherapy" Master's Program framework. This study aims to investigate Physiotherapy Exercise's effects on the components of balance and jumping agility in adolescent students of Special Schools with increased Body Mass Index (BMI).

### Materials and Methods

24 special education students, age 13-20, were divided into two groups, a Control Group with Body Mass Index (BMI) mean  $23.99 \pm 8.56$  kg/m<sup>2</sup> with and Physiotherapy (PT) Exercise group with BMI mean:  $35.03 \pm 10.89$  kg/m<sup>2</sup>. The rehabilitation program included balance exercises, coordination task exercises, core strength and ball exercises. Intervention lasted 2 sessions per week for 3 months, 45 minutes each. Participants were evaluated with balance, agility and coordination tasks before and after the experiment process.

### Results

The results were analyzed in by using SPSS program. Groups differed significantly from each other in terms of Body Mass Index. Control group performed better on all tests in the first evaluation phase. There was significant improvement in both groups. PTE Group increased percent change (Mean >15%) in post-intervention tasks performance.

### Conclusions

Balance and agility improvement is affected by weight gaining factors. Physiotherapy exercise benefits balance and jumping ability improvement, when it comes to special school adolescent students with increased (BMI). More research needs to be conducted for a comprehensive perspective.

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### KeyWords:

Adolescents, Special Education Schools, Balance, Agility, Jumping Skills Increased Body Mass Index, Physiotherapy, Therapeutic Exercise

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## « PREDICTORS OF INITIAL LEVELS OF PAIN AND DISABILITY IN PATIENTS WITH NECK PAIN »

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### ABSTRACT

#### Introduction

Neck pain (NP) is the fourth leading cause of disability worldwide. It manifests with symptoms that may be associated with multiple pathologies, with each patient experiencing their own unique pain experience (1). The factors contributing to NP are diverse, including physical, occupational, and psychological components (2).

#### Purpose

The study analyzed the relationship between patients' initial clinical characteristics and levels of pain and disability, prior to physical therapy sessions, in order to investigate the associations between physical or psychological factors.

#### Materials and Methods

A cohort study was conducted with a sample of NP patients from a physical therapy clinic of a large municipality of Attica (n=71, ratio 1:10). The study examined 12 prognostic factors: 1) age, 2) gender, 3) body mass (BM), 4) symptom chronicity, 5) sitting position at work, 6) symptom location, 7) initial pain intensity, 8) initial neck disability (NDI), 9) initial physical activity levels (iPAQ), 10) cranio-vertebral angle (PostureScreen mobile), 11) anxiety and depression (HADS), 12) job satisfaction (MSQ). The univariate and multivariate relationship of the characteristics (3) was examined.

#### Results

Increased levels of NP were associated with reported pain in the upper extremity, severe (NDI 25-34/50) or complete disability (NDI >34/50) (p=0.029), high physical activity levels (p=0,011), and increased depression (p=0,043), with the model

explaining 37.7% of the variance in pain. Higher levels of disability were associated with higher pain levels (p<0,001), increased anxiety and depression (p<0,001), with the model explaining 49.3% of the variance in disability.

#### Conclusions

NP represents a multifactorial condition with a bidirectional relationship between pain and disability. Both physical, and psychological factors should be addressed during the rehabilitation of patients with NP. The results of this study can aid in clinical reasoning strategies for choosing intervention methods for patients with NP.

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**Key Words:** neck pain, predictive factors, psychological, physical factors.

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# "EPIDEMIOLOGICAL PROFILE AND MUSCULOSKELETAL INJURIES OF AMATEUR SOCCER PLAYERS IN GREECE"

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† The present study is part of the doctoral dissertation of PhD candidate Mr. Vassis Konstantinos.

## ABSTRACT

### Introduction

Football, the world's most popular sport (1), is characterized by intense physical nature leading to a high frequency of injuries, especially at the recreational and professional levels (2). The sport's inherent nature contributes to a comparatively higher injury rate compared to other sports, impacting both team performance (3) and players' quality of life (4), posing a significant threat to their careers (5). Despite extensive research on injuries in professional football, millions of non-professional athletes participate, raising questions about the applicability of professional injury data to amateur football (6,7). Studies suggest a higher prevalence of injuries in amateur players, emphasizing the need for a healthy and safe playing environment (8).

### Purpose

To investigate the epidemiological profile, sports history, training routine, injury occurrence and the most common injury types and locations among amateur football players in Greece during the 2022-23 football season.

### Methods

A retrospective epidemiological study using an online questionnaire targeted amateur football players in Greece. Data were collected from May to June 2023, following the CHERRIES Checklist methodology.

### Results

This study involved 222 amateur football players in Greece (18-44 years, mean age 25.25 ± 5.74 years). They had an average football experience of 8.93 ± 6.88 years, with 70.7% reporting at least one injury. A total of 220 injuries occurred during

the season, resulting in an incidence of 5.3 injuries/1000h. Most injuries (56.7%) happened during matches, predominantly affecting the lower limbs (80%). The most common injury locations were the posterior thigh area (17.2%) and inner thigh area (14.6%). Strains were the predominant injury type (42.7%), often caused by running/sprinting (31.2%). Players were 6.6 times more likely to sustain injuries during games (12.15 injuries/1000h) compared to training sessions (1.82 injuries/1000h).

### Conclusions

The findings emphasize the need for tailored preventive measures to ensure safer amateur football play, underscoring that understanding the prevalent injuries among these athletes is crucial for developing targeted strategies to mitigate their occurrence.

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**Key Words:** amateur football, injury incidence, epidemiology, epidemiological profile

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# Reliability and Validity measures of the Patellofemoral subscale (KOOS-PF) in the Greek version

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## ABSTRACT

### Introduction

Patellofemoral pain (PP) is one of the most common multifactorial musculoskeletal pathologies, originating from the patellofemoral joint or from the soft tissues surrounding it [1]. The prevalence of PP in the general population ranges from 11-17% and in special population groups (female population, runners, military personnel, young athletes) [2]. In recent years, the Patellofemoral subscale (KOOS-PF) has been created with the aim of evaluating the population with PP symptoms [3]. The KOOS-PF scale assesses pain, stiffness and quality of life in people with PP [4], [5].

### Purpose

The aim of the study was reliability and validity testing of the KOOS-PF scale in the Greek language.

### Materials and Methods

Validity and reliability of the measurements was checked through a questionnaire translated into the Greek language and in participants of the Greek population of both sexes suffering from PP, aged 18 to 65 years. The sample size was determined by the number of questions on the scale, so that 55 participants were collected. The measurement process was carried out in 2 phases between the 1st and 3rd day. In the 1st phase, the intensity of their pain was assessed through the Visual Analog Scale (VAS), the completion of the KOOS-PF scale, which was repeated on the 3rd day, as well as the completion of the Greek version of the Knee Outcome Survey scale -Activities of Daily Living Scale (KOS-ADLS).

For validity testing, construct validity was used by correlating the KOOS-PF scale with the

KOS-ADLS scale. For the reliability test, repeated measurements were performed through the repeated measurements Intraclass Correlation Coefficient (ICC), the standard error (SEM) and the smallest detectable change (SDD), while at the same time an internal consistency reliability test was performed through the Cronbach's a coefficient.

### Results

The Greek version of the KOOS-PF patellofemoral pain scale showed high reliability of internal consistency (Cronbach's alpha 0.87,  $p=0.05$ ) and high reliability of repeated measurements (intraclass correlation coefficient 0.95,  $p=0.05$ ) with the standard error (3.7) and smallest detectable difference (13.57). In addition, the Greek KOOS-PF scale was found to have high convergent validity when tested with the KOS-ADLS scale (Pearson correlation,  $r=0.72$ ,  $p=0.001$ ).

### Conclusions

The results of the study showed high reliability and validity measurements of the Greek version of the Patellofemoral scale (KOOS-PF), therefore it can be used in the Greek population, both for the evaluation of patients with PP and in further research studies of special populations.

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**Key Words:** Patellofemoral Pain, construct validity, test-retest reliability, KOOS-PF

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## «EXAMINING PERFORMANCE BETWEEN DIFFERENT COGNITIVE-MOTOR DUAL-TASK TESTS IN COMMUNITY-DWELLING OLDER ADULTS»

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### ABSTRACT

#### Introduction

Performing dual-task (DT) activities is essential for independent living among elderly people and is essential for independent living [1]. No study has investigated motor performance in various cognitive-motor DT activities, utilizing the Timed Up and Go (TUG) test.

#### Aim

To compare motor performance between four cognitive-motor DT activities in community-dwelling older adults, utilizing the TUG test.

#### Material and Methods

The sample consisted of 60 elderly women aged 72.22 years (SD=5.11). Functional lower limb muscle strength was assessed with the 30-Second Chair Stand Test, dynamic balance with the Four Square Step Test and balance confidence with The Activities-specific Balance Confidence Scale. The four cognitive tests were: (a) mental calculation (counting down by 3), (b) memory recall (memorizing and recalling a list of products), (c) verbal fluency (producing and recalling words from a specific letter), (d) reaction to stimulus. The TUG test was performed as a single activity and then the cognitive tests were performed simultaneously with the TUG. To assess motor performance, the time to complete each test was recorded and the dual task cost (DTC, %) was calculated [2]. Paired t-tests between the participant's characteristics, the TUG tests and the DTCs were performed. The TUG tests were correlated with each other and with the characteristics of muscle strength, balance and balance confidence using Pearson r correlations.

#### Results

There were statistical differences between participant's characteristics and DTCs ( $p < .001$ ). The main results of the present study is that the mental calculation ( $r = .63, p < .01$ ) and verbal fluency ( $r = .65, p < .01$ ) tasks showed similar positive

correlation with the TUG test and they influenced the motor performance more than all DT tests. The reaction to the stimulus test showed a high relationship with the TUG test ( $r = .89, p < .01$ ) and it was least detrimental to the motor performance.

#### Conclusions

The motor performance of older adults in DT activities depends on the type of cognitive task. Adding a cognitive load to the TUG test may improve its ability to identify community-dwelling older adults at risk for falls, aiding in the development of targeted interventions. Further research is required to validate these findings [3].

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**Keywords:** dual-task, Timed Up and Go, community-dwelling older adults, geriatric physiotherapy

*Note: The paper is the product of an undergraduate Bachelor thesis.*

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## «Work-related musculoskeletal disorders among physical therapists: Characteristics and risk factors»

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### **Introduction**

As demands for rehabilitation services increase, work-related musculoskeletal disorders (WRMD) have increased among rehabilitation professionals (1). These lead to costly implications for workers, loss of work productivity, and distressing long-term health problems (2). The present study focuses on physical therapists, who perform demanding tasks every day, although these characteristics are not well known (3).

### **Purpose**

The aim of this study is to provide information about the WRMD among physical therapists, their characteristics and the risk factors, promoting their prevention.

### **Material and Methods**

This is a systematic review of the literature. The method used was the search of the English literature in databases (PubMed, JMIR, BMC, Research Gate). Key search phrase used "work-related musculoskeletal disorders among physical therapists" and the keywords "characteristics", "prevalence", "risk factors". Researches with a writing period of 2014-2024 were selected. All types of studies were accepted.

### **Results**

Of the 253 studies, 76 met the entry criteria. These were studied in terms of characteristics of WRMD (n=6), prevalence (n=30) and risk factors (n=30). Most physical therapists complained of low back (n=32), neck (n=19) and shoulder (n=13) pain. The most positive correlations are female gender (n=16) and younger age (n=16). The main risk factors are the frequent application of manual therapy (n=18), poor posture (n=16), the specialty (n=16) and patient transport (n=15).

### **Conclusions**

Through the search of the literature, the high incidence of WRMD among physical therapists. Understanding the risk factors is crucial to enhance their health promotion (4). Consequently, their training on ergonomic principles and practical training in the handling of patients with assistive devices, are the basic tools for their prevention (5). Finally, there seems to be a clear lack in international clinical studies exclusively for physical therapists and an even greater lack in the Greek literature. Therefore, it is suggested to carry out new research with the above references as suggestions for future studies.

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**Key words:** work-related musculoskeletal disorders, physical therapists, characteristics, risk factors

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# «Title» “Artificial Intelligence-Driven Virtual Rehabilitation: A Scoping Review”

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## ABSTRACT

AI-driven virtual rehabilitation represents a paradigm shift in the way rehabilitation services are delivered to community-dwelling individuals. The ability to provide continuous, personalized care in the home environment could revolutionize rehabilitation, particularly for individuals with limited access to traditional clinical settings due to geographical, financial, or physical barriers.

### Introduction

Rehabilitation is an essential aspect of healthcare, especially for individuals recovering from injury, surgery, or living with chronic disabilities. Traditionally, rehabilitation has been delivered in clinical settings under the guidance of healthcare professionals. However, the advent of new technologies, including artificial intelligence (AI), is reshaping the landscape of healthcare delivery. AI-driven virtual rehabilitation offers an innovative approach to support individuals living in the community, providing opportunities for tailored, accessible, and continuous therapy beyond the confines of clinical environments.

### Purpose

This scoping review aims to explore the role of AI in virtual rehabilitation for community-dwelling individuals. The focus will be on understanding how AI is being used to enhance rehabilitation outcomes, identify the potential benefits and challenges of such approaches, and map existing research to inform future developments in this field (1).

### Materials and Methods

The scoping review followed the methodological framework proposed by Arksey and O'Malley. A comprehensive search of academic databases such as PubMed, Scopus, and IEEE Xplore were conducted to identify relevant studies. The inclusion criteria were as follows: studies published in peer-reviewed journals between 2015 and 2023, focused on AI-driven virtual rehabilitation interventions for community-dwelling individuals. Exclusion criteria included studies that involved inpatient rehabilitation or did not incorporate AI technology.

Data extraction focused on key characteristics such as study design, AI algorithms employed, rehabilitation domains (e.g., motor, cognitive, or speech rehabilitation), and outcomes measured. The data were synthesized to map current evidence and identify research gaps in this emerging field (2).

## Results

The scoping review identified several key trends in AI-driven virtual rehabilitation for individuals living in the community:

1. AI Applications in Rehabilitation: AI is being used in various rehabilitation modalities, including motor, cognitive, and speech therapy. Machine learning algorithms, particularly deep learning, are frequently employed to tailor rehabilitation exercises to individual needs, monitor progress, and provide real-time feedback.

2. Benefits of Virtual Rehabilitation: AI enables adaptive learning, which adjusts the difficulty level of tasks based on the user's performance, providing a more dynamic and responsive rehabilitation experience.

3. Integration of Wearable and Sensor Technologies (3).

## Conclusions

The findings from this scoping review suggest that AI-driven virtual rehabilitation holds considerable promise for enhancing rehabilitation outcomes among individuals living in the community. The integration of AI with sensor technologies and adaptive learning algorithms has the potential to deliver personalized, accessible, and effective rehabilitation. However, the field is still in its early stages, and further research is required to overcome current limitations and fully capitalize on the opportunities offered by this technology (3).

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**Key Words:** Artificial Intelligence, Physical therapy, rehabilitation.

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## «Title»

### «Prevalence and associated factors of burnout and quiet quitting among physical therapists»

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#### ABSTRACT

The growing concern about the occurrence of burnout syndrome and consequently the quiet quitting of physical therapists in Greece brought to the forefront the need for this systematic review, which aimed to assess the prevalence of burnout syndrome and the factors associated with it, among healthcare workers (NHS) in Greece, and specifically among active physical therapists in the National Health System.

#### Introduction

Reasons for silent resignation instead of active withdrawal are: financial stability, avoidance of active confrontation, and hope for change.

Inescapably we can be led to the conclusion that from a deep investigation it is a major issue in the health field which is plagued by understaffing and lack of resources.

#### Purpose

The purpose of writing about burnout and silent resignation is to assess the extent of the problem, to identify the factors that contribute to it, to explore the consequences, to communicate organizational and policy changes, to contribute to the wider literature on professional well-being health and especially of Physiotherapists and to support their professional development and staying in the profession.

#### Materials and Methods

Five databases (MEDLINE/PubMed, PsycINFO, EMBASE, Dialnet, and MEDES) were searched until August 5, 2024, according to PRISMA guidelines. Quantitative studies that reported the prevalence of burnout syndrome and silent resignation among active physical therapists in the Greek area were taken into account. The reference lists of the selected studies were examined with the quality tool Atlas.ti. Data were extracted from peer-reviewed articles.

#### Results

Twenty-six studies were included in the period 2023-2024. Overall, the quality of the studies was moderate. The most widely used tool was the Maslach Burnout Inventory. The mean prevalence

of burnout was 35.3% (k=11 studies). However, rates varied significantly between studies, which may also be due to methodological differences. Inconsistent associations were found regarding participants' gender and years of education. The relationship of burnout with academic and mental-health variables had a direct relationship of consistency across studies. It was observed that personal characteristics, such as increased resilience, seem to protect against burnout and a possible future silent resignation.

#### Conclusions

Professional burnout and the possibility of a silent resignation seem to be widespread among physical therapists in Greece and may be influenced by academic, psychological and personal factors. The identification of risk and protective factors for burnout could assist in the development of prevention and management strategies aimed at reducing the negative consequences in this population.

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**Key Words:** Burnout syndrome, prevalence, risk factors, quiet quitting, Greece, Physical Therapists.

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## «Stress, MSK health and Counselling in Physiotherapy»

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### ABSTRACT

#### Introduction

Numerous studies have consistently demonstrated a strong interrelationship between musculoskeletal disorders and mental health, with anxiety and depression frequently presenting as comorbidities (Maki et al., 2024). According to Alexander, et al. (2015), the significance of recognizing these psychological disorders lies in their crucial importance for the effective management of patients with these conditions. In particular, research has consistently demonstrated that when patients with musculoskeletal disorders are incorporated into a comprehensive rehabilitation program, including physical therapy interventions for psychological disorders conducted by physiotherapists, it leads to improved health outcomes for the patient (Guerrero et al., 2018). For instance, according to Sterling et al. (2019), in patients who have experienced whiplash injury, the combination of exercise and psychological intervention has been found to result in improved pain management and overall treatment outcomes, as compared to traditional physiotherapy models.

#### Purpose

The primary objective of this study is to highlight the significance of managing psychological comorbidities in patients with musculoskeletal disorders in the integration of a rehabilitation program. Additionally, it aims to broaden the understanding of physical therapists and provide valuable information regarding psychological interventions within the therapeutic plan.

#### Materials and Methods

Methods: The methodology employed was a systematic review, which entailed comprehensive electronic searches of PubMed and Google Scholar. The inclusion criteria comprised scientific articles published in the English language between 2015 and 2024. A comprehensive review of the literature was conducted, incorporating both qualitative, quantitative, and mixed-methods studies that focused on the perspectives of physical therapists regarding the application of psychological interventions

#### Results

Evidence suggests that psychological interventions in patients with musculoskeletal disorders can lead

to positive outcomes regarding pain, functionality, and overall health-related quality of life.

#### Conclusions

Despite the evidence suggesting that psychological interventions improve outcomes and patient satisfaction in individuals with physical illness, the current healthcare model continues to dichotomize physical and mental health care, with physiotherapists reporting that they are uninformed regarding which techniques they can utilize to manage patients' psychological disorders.

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**Key Words:** Psychological interventions, counselling, musculoskeletal pain

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## «TEST-RETEST RELIABILITY OF A FUNCTIONAL BATTERY OF TESTS FOR HIP AND GROIN AREA»

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† The present study is part of the Master's thesis of the student Tziouvara Evangelia.

### ABSTRACT

#### Introduction

Hip and groin injuries are characterized by significant prevalence (1) especially in high-intensity sports and sports activities which include specific movement patterns (1), (2). However, there are essential gaps in the literature regarding the existence of specific functional tests suitable for the detection of hip and groin pain, the quantification of possible functional deficits and the assessment of functional performance (3).

#### Purpose

The main aim of the research, which was a Master's thesis, was to create a functional battery of tests including valid and reliable functional tests and then as a second aim to investigate its test-retest reliability.

#### Materials and Methods

Twenty-six healthy men, amateur football players with active sports participation and an average age of  $22.08 \pm 4.31$  years were examined by the same rater in two different testing sessions, with a seven-day interval, under exactly the same conditions. All the participants performed the same recommended functional battery of tests, consisting of the following functional tests: Y-Balance Test Lower Quarter (YBT-LQ), Crossover Triple Hop Test for distance (XHOP), Agility T-Test (TT), Edgren 10-second Side Step Test (ESST) and Illinois Agility Test (IAT).

#### Results

The results demonstrated good to excellent test-retest reliability of this functional battery of tests ( $0.78 < ICC < 0.96$ ,  $0.789 < \alpha < 0.968$ ), with very good CV ( $CV < 10$ ), reliable SEM and acceptable SRD ( $SRD < 30\%$ ). At the same time, it appeared to be  $LSI \geq 90\%$  for all variables in both testing sessions and through Repeated measures ANOVA analysis statistically significant differences in performance between sessions were detected in the YBT-LQ-ME ( $p = 0.007$ ) and the IAT ( $p = 0.011$ ).

### Conclusions

The above findings confirmed that the experimental standardized protocol could be a useful screening tool and could be used both in clinical practice and in sports in order to serve this purpose.

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**Key Words:** functional battery of tests, hip joint, groin area, test-retest reliability, healthy athletes.

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## Surveillance of cerebral palsy in the prefecture of Magnesia. A Pilot study.

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Cerebral palsy (CP) is an "umbrella" definition of a group of disorders. Its etiology concerns a relatively unknown field as it includes different types of clinical patterns in which depending on the point of the damage depends the clinical manifestation and the severity of the CP. Several databases of CP registries have been created for each country in order to collect information on the epidemiology of CP, but for Greece there are not enough recent data regarding the epidemiology of CP. It is a pilot study of the surveillance of children with CP in the prefecture of Magnesia, as part of the master's thesis, in order to determine its occurrence rate in the prefecture, the predominant type of CP and the occurrence rates of the other forms.

**Method:** A templated questionnaire was created with 4 variable sections, which have been used in other studies. The sample of the study included children with diagnosed CP up to 18 years old, who were permanent residents of the prefecture of Magnesia and attended F/T and/or S/T and/or O/T sessions.

**Results:** A sample of 25 children (Mean Age = 11.76 years) with CP was taken, of which 14 were boys. 48% of the children were born by caesarean section and the main method of conception was natural. The 12 children were born very prematurely (M.O birth weight(gr)=2428.33) and the highest percentages belongs to 38 and 40 weeks of pregnancy (M.O of weeks of pregnancy =35.38). The 18 children were admitted to the ICU with a maximum hospitalization of 90 days. The predominant type of CP was spastic (64%), while the predominant muscle tone was hypertonia (48%). The causes of CP in the sample were mainly postnatal and 68% had seizures, 44% reported vision problems and 92% had normal hearing.

**Conclusion:** The results of the study are in agreement with other studies that the largest percentage of children with CP are boys and that the number of children with CP is decreasing as we approach the current data. Caesarean section, maternal age, prematurity, low birth weight and gestational weeks are implicated in the etiology of the sample. The spastic type of CP as well as hypertonia predominate in the sample, data that are in agreement with other studies.

**Key Words:** cerebral palsy, registries, epidemiology

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## «Examination of the validity and reliability of the Greek version of the Psychological Readiness of Injured Athlete to Return to Sport (PRIA-RS) Questionnaire»

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### ABSTRACT

#### Introduction

Athlete's psychological readiness after an injury directly affects the ability to return to sport (RTS) quickly and safe (1). There is no any valid tool that examines a rehabilitated athlete's psychological readiness in RTS in Greece. The questionnaire "Psychological Readiness of the Injured Athlete on Return to Sport" (PRIA-RS) is proposed to be a reliable and valid tool for the comprehensive assessment of the psychological readiness of an athlete returning to sport (2).

#### Purpose

To investigate the reliability and validity of the PRIA-RS in Greek male athletes of soccer.

#### Materials - Methods

The sample consisted of 113 male rehabilitated athletes of soccer in the RTS phase with previous musculoskeletal injury to the lower limbs. The mean age and duration of absence from sport of the sample was 24.68 years (SD=3.94) and 19.8 days (SD=9.11) respectively. The sample had specific inclusion and exclusion criteria to participate in the study. The PRIA-RS consists of 2 factors "Insecurity, Self-confidence, Individual perception" (with 7 items) and the "Fear of Re-injury" (with 3 items), on a 5-point Likert scale (1: very bad and 5 very good). Following the cross cultural adaptation procedure, it was translated, back translated and revised by a panel of experts (i.e., six people with excellent knowledge of English, theoretical basis of the questionnaire and process of adapting questionnaires to a Greek population). The sample also completed a demographic questionnaire and three valid questionnaires: "Causes of Re-Injury Worry Questionnaire" (CR-IWQ), the "Sport Confidence Questionnaire of Rehabilitated Athletes Returning to Competition" (SCQ-RARC) and the "Attention Questionnaire of Rehabilitated Athletes Returning to Competition" (AQ-RARC) to assess the concurrent validity. The face validity was examined and the construct validity of the questionnaire was tested through Exploratory Factor Analysis (EFA).

Test-retest reliability and internal consistency indexes were also investigated.

#### Results

The face validity of the PRIA-RS was supported and the EFA through the PCA method confirmed the initial factor structure of the 2 factors, which explain the 63.52% of the total variance with eigenvalues ranging from 1.94 to 4.42. The loadings of the items were acceptable. The correlations of the concurrent validity between PRIA-RS with other 3 questionnaires were moderate. The PRIA-RS demonstrated good internal consistency (Cronbach's  $\alpha=0.82$ ). The intraclass correlation coefficients (ICC) for test-retest reliability of each factor were excellent (ICC=0.97-0.99).

#### Conclusions

The PRIA-RS questionnaire is a short psychometrically approved tool that can be used for future clinical use and research.

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#### Key Words:

Psychological readiness, cross-cultural adaptation, re-injury anxiety, self-confidence, attention, soccer

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The present study was BSc degrees dissertation

## “THE EFFECTS OF TECAR THERAPY ON LOWER EXTREMITIES IN INJURED DANCERS”

Roupakia Kalliopi, Matousidis Georgios, Koutsogiannis Konstantinos

### ABSTRACT

**[Introduction]** Dance is an art form that combines physical activity with the promotion of individual health. Like all athletes, dancers are prone to injuries due to the physical demands placed on them. On the other hand, the TECAR device represents a new technology in diathermy that helps accelerate the healing process of cells.

**[Objective]** The primary purposes of this undergraduate research project, which is being conducted for the first time in a global scale, are to examine the effects of TECAR therapy on the muscle strength and elasticity of the quadriceps and hamstrings in injured dancers, as well as to investigate its contribution to injury prevention.

**[Methods]** The study was designed as a pilot study with an intervention group and a control group. The protocol included therapeutic massage and the use of the TECAR device, and the sample was evaluated using goniometry and dynamometry methods for the quadriceps and the hamstrings. The final sample primarily consisted of injured dancers, but a small group of healthy dancers was also included to assess the protocol's role in injury prevention. During the process, four participants withdrew for personal reasons or due to inconsistency with the treatment program.

**[Results]** Statistical data were analyzed using SPSS 26.0. The analysis was approached descriptively through descriptive statistics, t-tests and Pearson correlation coefficients. For values where  $p < 0.05$ , a significant difference was observed in the examined parameters after the application of the protocol. No conclusions were drawn regarding injury prevention, as the sample was insufficient to reveal significant differences.

**[Conclusions]** TECAR hyperthermia, as a primary therapeutic method, can serve as an effective rehabilitation plan for injuries involving the quadriceps and hamstrings in dancers. However, the area of injury prevention requires further research in order to establish and develop this protocol.

**[Keywords]** dance, dance injuries, lower extremities, hyperthermia, TECAR

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## “COMPARISON AND EVALUATION OF THE TORQUE RATIO OF EXTERNAL/INTERNAL SHOULDER ROTATORS IN AN ASYMPTOMATIC POPULATION.”

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† The present study is part of the undergraduate thesis of the students Charalampaki Marina and Menti Smaragdi

### ABSTRACT

#### Introduction

The balance in the torque of antagonistic muscle groups contributes to improve muscle performance issues and the risk of injury (1). The shoulder joint is vulnerable to injuries in both the general population and athletes (2). One of the main reasons for shoulder injuries is the deviation of the ratio between the external and internal shoulder rotators from the normal range, which should be between 0.66 and 0.75 (3,4). Most injuries occur during two phases of the throwing motion: the cocking phase and the deceleration phase, when the shoulder is in external rotation (5). The ratio is calculated based on the Maximum Torque (MT) data of the antagonistic muscles, regardless of the point in the range of motion. The ratio is likely more important in a specific part of the motion trajectory, close to where injuries occur or when approaching an angle dangerous for injury, as maximum torques correspond to the torque produced at a particular point in the motion path.

#### Purpose

The objective is to observe and study the MT ratio of external/internal rotators at the angles where most injuries occur, with the ulterior goal of approaching a new method of injury prevention.

#### Methods

Fifty-seven healthy and physically active men (age  $21.5 \pm 2.1$  years) were evaluated using the isokinetic dynamometer Biodex System 4 Pro at angular speeds of 60°/sec and 120°/sec in a seated position, with the shoulder in the scapular plane.

#### Results

The average ratio was 0.8 and 0.78 when measured across the entire trajectory at angular speeds of 60°/sec and 120°/sec, respectively. The ratio in the trajectory of the greatest external rotation that could be measured simultaneously at both angular speeds was 0.45 and 0.39, respectively.

#### Conclusions

As the limb approaches external rotation, the MT of the external rotators decreases significantly, causing the ratio to fall below the normal limits. Health professionals involved in the prevention and treatment of shoulder injuries should consider the ratio and its variation at different angles of the ROM (Range of Motion) to apply a more targeted approach, with special attention to the part of the trajectory where injuries are most common.

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**Key Words:** Shoulder, Injuries, Prevention, External/Internal Rotator Ratio, Isokinetic Evaluation

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## «Research of job satisfaction of physiotherapists in Greece»

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### ABSTRACT

#### Introduction

Job satisfaction is a critical aspect of an individual's well-being and overall quality of life (1). It encompasses the attitudes, emotions, and perceptions of an employee regarding their work, the work environment, and the organization to which they belong (2). Research on job satisfaction is essential for various reasons, as it can have a significant impact on both the individual and the organization

#### Purpose

To investigate the job satisfaction of physiotherapists. Differences in satisfaction levels were also examined based on gender, educational level, and income, as well as the relationship between overall satisfaction and its specific dimensions.

#### Materials and Methods

This research is a cross-sectional observational study using a closed-ended questionnaire. Participants were defined as physiotherapists who are graduates of higher education institutions (TEI or AEI), registered with the Physiotherapy Association of Greece (PSF), and employed in public or private sectors throughout Greece. A total of 111 individuals participated. Convenience sampling was used to obtain the sample, which is a non-probability sampling method. The Job Satisfaction Survey (JSS) by Paul Spector was utilized to measure job satisfaction. SPSS v.29 software was used for data analysis.

#### Results

The findings indicated that physiotherapists experience moderate job satisfaction, with a mean score of 95.6 (22.3). No statistically significant differences in satisfaction were observed based on gender, educational level, or income ( $p > 0.05$ ). A positive correlation ( $p < 0.05$ ,  $r = 0.40-0.69$ ) was

found between job satisfaction and all its factors. Additionally, the nine dimensions of job satisfaction were positively correlated ( $p < 0.05$ ,  $r = 0.26-0.79$ ), while no positive correlation was noted between the dimensions of privileges and nature of work ( $p = 0.078$ ,  $r = 0.19$ ).

#### Conclusions

Job satisfaction is not as closely related to the demographic characteristics of working physiotherapists but rather to the overall work conditions, as indicated by the investigation of the relationship between job satisfaction and its specific dimensions as well as the relationships among those dimensions.

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**Key Words:** job satisfaction, JSS, physiotherapists, working conditions

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The present study is a master's thesis.

# «The effect of the Copenhagen Adduction and Nordic Hamstring exercises on muscle strength and athletic performance»

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## ABSTRACT

### Introduction and purpose

Hamstring and hip adductor muscle injuries are two of the most common muscle injuries in football, with a rate of 37% and 23% respectively (2). Reduced muscle strength poses a risk factor for hamstring and adductor injuries (1), (5). Two of the most common exercises used in prevention as well as rehabilitation protocols are the Nordic Hamstring (NH) and Copenhagen Adduction (CA) exercises. Both exercises are easy to implement on pitch without equipment needed. Although their strength effect has been investigated (3), (4), the effect of the combination of both exercises on muscle strength, jump and sprint performance of male football (soccer) players has yet to be determined. The purpose of this semi-experimental study was to investigate the effect of combining the two exercises on muscle strength and athletic performance in young football players.

### Materials and Methods

A total of 38 players (15.3±0.49 years, 59.7±7.14 kg, 152.1±53.3 cm) from one amateur Greek football club participated in a progressive 4-week strengthening program, performing both the NH and CA exercises twice a week during the team's pre-season period. The NH group performed 2-3 sets of 5-7 repetitions, while the CA group performed 2 sets of 6-12 repetitions throughout the intervention, trying to achieve similar training volume. The main outcome measures were isometric hamstring force and eccentric adductor force. The secondary outcome measures were jumping ability, speed, and perceived exertion. Measurements were taken before the start and after the completion of the training protocol. Perceived exertion was recorded at the end of each exercise session every week with the use of a numeric scale 0-10.

### Results

There was a statistically significant increase of 11% ( $p<0.000$ ,  $d=0.57$ ) for isometric hamstring strength, and a statistically significant increase of 17% ( $p<0.000$ ,  $d=0.66$ ) for eccentric adduction strength. There was a decrease of 5-10% ( $p=0.000-0.034$ ,  $d=0.44-0.79$ ) for jump

performance, while there was a decrease in sprint time of 2-3%. ( $p=0.009-0.253$ ,  $d=0.36-0.55$ ). No statistically significant difference for perceived exertion between the two exercises ( $p=0.084-1.000$ ).

### Conclusion

A 4-week progressive exercise program with the Nordic Hamstring and Copenhagen Adduction exercises combined resulted in statistically significant improvements in both isometric hamstring and eccentric adduction strength, but it did not lead to significant results in jump and sprint performance in young football athletes.

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**Key Words:** Copenhagen adduction, Nordic hamstring, strength training, performance

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## «RECORDING OF VISCERAL DYSFUNCTIONS IN WOMEN WITH LOW BACK PAIN»

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### ABSTRACT

#### Introduction

Non-specific low back pain, which is not caused by any obvious pathoanatomical cause, is one of the most common pains, affecting up to 85% of the general population during a person's lifetime [1]. Low back pain can coexist with visceral pain or may be caused by various types of visceral dysfunctions (viscerosomatic pain) [2], which is under researched and requires further investigation.

#### Purpose

The investigation of any association and the frequency of visceral dysfunctions in women with low back pain (LBP).

#### Materials and methods

An electronic-based questionnaire was created through Google Forms application (Questionnaire for the Recording of Visceral Dysfunctions), which examines by category somatometric characteristics, history of LBP, previous abdominal surgeries, pain in the abdominal area, digestive symptoms, lower urinary tract symptoms and gynecological symptomology [3,4]. A convenience sample of 150 adult women (75 with LBP and 75 asymptomatic) participated, being recruited by 10 different physiotherapy clinics of Athens during a period of 2 months (April-May 2024). Data analysis was performed using Pearson's correlation coefficient with SPSS program.

#### Results

Women with LBP (42,67%: 18-30 years old, 17,33%: 31-45 years old, 28%: 46-60% years old, 12%: >60 years old) showed statistically significant correlations for most categories of visceral dysfunctions [pain in the abdominal area ( $r=0.60$ ,  $p=0.003$ ), digestive symptoms ( $r=0.71$ ,  $p=0.045$ ) gynecological symptoms ( $r=0.30$ ,  $p=0.02$ ), from the urinary symptoms ( $r=-0.04$ ,  $p=0.071$ ). For asymptomatic women (41,33%: 18-30 years old, 26,67%: 31-45 years old, 28%: 46-60 years old,

8%: >60 years old), no statistically significant correlations with visceral dysfunctions were reported [pain in the abdominal area, digestive symptoms, urinary symptoms or gynecological symptoms ( $r<0.2$ ,  $p>0.05$ ).

#### Conclusions

Visceral dysfunctions are more prevalent in women with LBP compared to healthy women. Women with LBP seem to suffer more frequently from irritable bowel syndrome, urinary incontinence, polycystic ovary syndrome and ovary cysts (compared to LBP-free women). Further investigation of the relationship between LBP and visceral pain is deemed necessary.

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#### Key words

Low Back Pain, Visceral Dysfunction, Gastrointestinal Dysfunction, Urological Dysfunction, Gynecology Dysfunction.

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## THE USE OF THE 6-MINUTE WALK TEST (6MWT) IN THE EVALUATION OF THERAPEUTIC EXERCISE PROGRAM IN OBESIC CHILDREN AND ADOLESCENTS"

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### SUMMARY

#### Introduction

Childhood obesity has significant detrimental effects on respiratory health and quality of life in childhood and adolescence. The evaluation of children using the 6MWT has been used in numerous studies in the international literature with an indicated clinical value of the tool to record any changes in cardiorespiratory function, motor performance and functionality, which provides valuable information about physical condition and development of these disorders. pocrates Hospital, Aristotle University of Thessaloniki.

**The purpose** of this research is to evaluate the effect of a therapeutic exercise program combined with the technique of otic neuromodulation on respiratory function in obese children and adolescents.

**Material and Methods.** The study evaluated 41 obese children and adolescents aged 8-18 years with a BMI >95th percentile. The children were divided into two groups: control group (A) and intervention group (B). In the control group, which included 20 children and adolescents aged 8-18 years with a BMI >95th centile and in the intervention group, which included 21 children and adolescents aged 8-18 years with a BMI >95th centile.

The collection and recording of the children's and adolescents' information was initially done at the Pediatric Endocrinology Unit of the 3rd University Pediatric Clinic of the Aristotle University of Thessaloniki (A.U.Th) at the General Hospital of Thessaloniki Ippokrateio. The study was approved by the bioethics committee of the International University of Greece and signed consent was given

by the guardians of the children and adolescents upon their entry into it. Initially, the clinical picture of the children was evaluated and observed, and then the respiratory function was assessed using the 6 walk test before and after the end of the study. Then there was training - teaching of the physiotherapy program which included breathing exercises and therapeutic exercises, as well as application of bacaria seeds in the ear to reduce appetite and anxiety.

**Results.** After the program, the intervention group showed a significant improvement in body condition in body weight reduced by 2,266 kg, in body mass index reduced by 1.66435 difference statistically significant at the level of statistical significance  $\alpha=1\%$  and in the increase in distance and steps with use of the 6 walk test.

**Conclusion.** Based on the above, the importance of the role of the physical therapist in the management of cases of obesity in childhood and adolescence is emphasized through therapeutic exercise programs in combination with the articular neuromodulation technique. This program can lead to weight loss and improve the respiratory capacity of obese children.

**Keywords:** Children obesity, Physical Therapy, Physiotherapeutic techniques, Articular neuromodulation ,

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## "PREVENTION OF SPINE DEFORMATIONS IN CHILDREN AND ADOLESCENT AGE - PARENTS' CONTRIBUTION"

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### SUMMARY

#### Introduction

Childhood obesity has significant detrimental effects on respiratory health and quality of life in childhood and adolescence. The evaluation of children using the 6MWT has been used in numerous studies in the international literature with an indicated clinical value of the tool to record any changes in cardiorespiratory function, motor performance and functionality, which provides valuable information about physical condition and development of these disorders. Pocrates Hospital, Aristotle University of Thessaloniki.

The purpose of this research is to evaluate the effect of a therapeutic exercise program combined with the technique of otic neuromodulation on respiratory function in obese children and adolescents.

#### Material and Methods.

24 students, aged 12, from sections A4, A5, A2, of the 4th primary school of Kalamaria took part in this research, of which 17, after evaluation, had internal rotation in the shoulders and kyphosis in the spine, as well as reduced mobility of the spine. The treatment protocol included for all children teaching correct posture when sitting, when walking, breathing exercises, with movements of the limbs and trunk, diaphragmatic breathing, exercises with the Klapp method.

For the present study, a tape measure was used as a measuring tool to measure the mobility of the chest and the heaving test.

**Results.** The main goals during the implementation of the therapeutic program are to improve the appearance of the body and the aesthetic result, the training for daily activities, the improvement of pain and respiratory

function and in general the improvement of the quality of

life of the children. After the program, the intervention group showed a significant improvement in body condition in body weight reduced by 2,266 kg, in body mass index reduced by 1.66435 difference statistically significant at the level of statistical significance  $\alpha=1\%$  and in the increase in distance and steps with use of the 6 walk test.

**Conclusion.** Based on the above, the importance of the role of the physical therapist in the management of cases of obesity in childhood and adolescence is emphasized through therapeutic exercise programs in combination with the articular neuromodulation technique. This program can lead to weight loss and improve the respiratory capacity of obese children. According to the results of the survey there was a significant improvement in almost the entire percentage of participants. In children with back pain, reduced mobility, wrong position and kyphosis there was an improvement.

**Key words:** Physiotherapy, kyphosis, klapp spinal deformities, scoliosis.

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# The Impact of TRX Suspension Training on Athletic Functional Performance: A Systematic Review

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## INTRODUCTION

TRX suspension training is a versatile and innovative bodyweight exercise system designed to improve core stability, strength, flexibility, and overall athletic performance. TRX, which stands for Total Body Resistance Exercise, is a training system that utilizes suspension straps. These straps attach to a fixed point, allowing you to perform a wide variety of exercises using only your body weight as resistance.

In recent years, TRX suspension training has gained popularity among athletes due to its versatility and functional approach. Despite its widespread use, the scientific evidence regarding its effectiveness in enhancing functional performance across various athletic populations is still evolving. This systematic review aims to summarize and critically evaluate the existing literature on the effects of TRX suspension training on the functional performance of athletes. Additionally, it seeks to draw conclusions about the benefits of this specific technique compared to traditional strength training programs. A key characteristic is that most of the studies found focused on training programs lasting 6-8 weeks, which may limit the findings as changes in upper and lower extremity strength, core strength, and balance ability in functional tests performed may be greater over a period exceeding 2 months.

Fifteen studies, listed in the references section, were reviewed. Two of these studies are highlighted below as examples. The first study (1) involved 30 non-athlete women who participated in an 8-week training program. The participants were divided into three groups: TRX, traditional, and control. Before and after the training period, physical fitness variables such as muscular strength and endurance, flexibility, and thigh and arm circumferences were measured. Results showed that both forms of training had a significant impact on muscular strength and endurance. There was no significant difference in flexibility or thigh and arm circumferences.

In study (2), eleven girls and thirty-two boys aged between 5.2 and 11.8 years participated. Resistance training sessions were conducted twice a week for 8 weeks. Children performed 1 set of 6 to 8 repetitions with a heavy load ( $n = 15$ ) or 1 set of 13 to 15 repetitions with a

moderate load (n = 16) on child-sized exercise machines. Children in the control group (n = 12) did not perform resistance training. The one-repetition maximum (1RM) and muscular endurance (repetitions performed after training with the 1-RM training load) were assessed in the leg extension and bench press exercises.

## MATERIALS AND METHODS

An extensive literature search was conducted using databases such as PubMed, Scopus, and Google Scholar for articles published up to September 2024. Studies were included if they evaluated the effects of TRX suspension training on functional performance variables, such as strength, balance, flexibility, agility, and power in athletes. In total, 15 studies met the inclusion criteria, ranging from randomized controlled trials to quasi-experimental designs. Data extraction and analysis focused on key outcomes, including performance on functional tests (Y-Balance Test, vertical jump, agility tests), muscular strength (1RM), and measures of core stability.

## RESULTS

The majority of studies reported positive effects of TRX training on functional performance, particularly in improving core stability, balance, and lower extremity strength. Significant improvements in balance performance were recorded, with improvements in Y-Balance Test scores observed in many studies. TRX training also showed moderate effects on strength, especially in the lower extremities and core, with some studies reporting results comparable to traditional resistance training. While results for agility and flexibility showed encouraging trends, the data were less clear, with variability in study designs and measurement tools contributing to inconsistent findings. No adverse effects from TRX training were reported, suggesting that it is a safe method for athletes.

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## «COMMUNICATION SKILLS TRAINING USING VIRTUAL REALITY (VR) ON PHYSIOTHERAPY STUDENTS»

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### ABSTRACT

#### Introduction

Training physical therapists in communication skills has been shown to enhance patient's satisfaction and improve their clinical outcomes (1). Virtual reality (VR) can serve as an innovative educational tool that allows the development of communication skills through interactive clinical scenarios using virtual patients (2).

#### Purpose

The purpose of this study was to investigate (a) the usability of VR scenarios and (b) the effectiveness of VR applications in improving the communication skills of physiotherapy students.

#### Materials and Methods

A VR scenario with a chronic musculoskeletal patient was used. The development of the scenario took place during the "Empathy In Health" project, Erasmus+K2 (3). Undergraduate physiotherapy students participated after completing the informed consent form. Repeated measurements were conducted at three points: A (pre-test), B (post-test), and C (two weeks after the application). Kirkpatrick's model was used for the training evaluation (3). The outcome measures included (i) an evaluation form of VR scenario, (ii) a multiple-choice questionnaire (quiz) based on the Calgary-Cambridge guide, and (iii) the self-efficacy questionnaire (SE-12). Descriptive analysis, One-way ANOVA, and t-tests ( $p < 0.05$ ) were used for the statistical analysis, while qualitative analysis was conducted for the two open-ended questions on the evaluation form. The Internal Ethics Committee of the Department of Physiotherapy, University of Thessaly, approved the study (Approval number: 1392/30-11-23).

#### Results

64 undergraduate students participated (32 second year and 32 fourth year), reporting high satisfaction

with the content of the VR scenario ( $9.05 \pm 1.08$ ) and the VR training method ( $8.81 \pm 1.23$ ), while most participants reported that they enjoyed the experience. Statistical analysis of the SE-12 questionnaire showed improvement in learning between measurements A and B ( $p < 0.05$ ) and learning retention between measurements B and C ( $p < 0.05$ ). No statistically significant differences were observed between measurements A and B as the quiz results indicated ( $p > 0.05$ ).

#### Conclusions

The application of virtual reality (VR) could serve an innovative, interactive, and useful educational tool that can increase physiotherapy students' confidence in their clinical communication skills.

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**Key Words:** *virtual reality, communication skills, educational tool*

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undergraduate students.

\* The study was conducted as a dissertation of



# “Comparison of the Effectiveness Between Endorphinic and Conventional TENS in Patients with Chronic Low Back Pain”

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## Introduction

Low back pain is the most common musculoskeletal disorder with a very high global prevalence (1,2). Depending on the duration of symptoms, it is classified as acute or chronic. Chronic low back pain (symptoms lasting more than 12 weeks) is associated with high rates of disability, emotional changes, and absence from work (3). The use of electrotherapy, particularly TENS, has shown analgesic effects and can improve pain and functional ability in individuals with chronic low back pain. However, the optimal frequency of current application has not been fully studied.

## Aim

This pilot randomized clinical trial aimed to compare the effectiveness of endorphinic TENS and conventional TENS in reducing pain and improving functional ability in patients with chronic low back pain. The study was conducted as part of the thesis work of Maria Chatzimichailidou, a student of the Physiotherapy Department at the International Hellenic University.

## Material and Methods

20 adults with chronic low back pain were randomized into two groups. The intervention group (n=8) received endorphinic TENS therapy for two weeks, while the control group (n=12) received conventional TENS therapy for the same period. Pain intensity was measured using the Numerical Pain Rating Scale (NPRS) and functional ability with the Roland-Morris Disability Questionnaire (RMDQ) before and after the intervention. A two-way analysis of variance (Two-Way ANOVA) with repeated measures and post-hoc tests was used to analyze the differences between the groups at each time point. Statistical significance was set at  $p < 0.05$ .

## Results

Both groups showed improvement in pain (NPRS) and functional ability (RMDQ) after the intervention. The endorphinic TENS group demonstrated a greater reduction in pain ( $p=0.021$ ) and improvement in functional ability ( $p=0.036$ ) compared to the control group. Specifically, the NPRS score decreased by 2.26 points in the intervention group and by 0.84 points in the control group. For RMDQ, the intervention group improved by 2.26 points, while the control group improved by 0.84 points.

## Conclusions

Endorphinic TENS was found to be more effective than conventional TENS in reducing pain and improving functional ability in patients with chronic low back pain, indicating the need for further research in larger samples.

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**Key Words:** endorphin-releasing TENS, conventional TENS, Physiotherapy, chronic low back pain, pain, functional capacity, statistical analysis.

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# “Psychologically Informed Physical Therapy Model for the Assessment and Management of Chronic Musculoskeletal Pain Through Self- Management Strategies”

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## Introduction

Chronic pain is a significant global health concern, a leading cause of functional disability, and a contributor to rising healthcare costs. Recent years have seen a notable surge in interest in implementing biopsychosocial non-pharmacological interventions for chronic musculoskeletal pain, focusing on self-management strategies. Psychologically informed physical therapy (PIPT) is an innovative approach that blends traditional physical therapies with cognitive-behavioral techniques.

## Purpose

Despite its potential, the adoption of psychologically informed practice by physical therapists faces implementation challenges, resulting in varied outcomes. To address this, we conducted a narrative literature review on PIPT, aiming to synthesize practices and propose a comprehensive self-management-based model.

## Materials and Methods

A comprehensive narrative literature review was conducted to explore the current landscape of psychologically informed physical therapy (PIPT) for chronic musculoskeletal pain. The search strategy included electronic databases such as PubMed, Google scholar and PsycINFO, covering literature up to October 2023. Keywords and Medical Subject Headings (MeSH) terms used in the search included "psychologically informed physical therapy," "chronic musculoskeletal pain," "biopsychosocial interventions," "self-management strategies," and related synonyms. Search included peer-reviewed articles published in English. Selected studies were analyzed to identify common practices, implementation barriers, and facilitators, which informed the synthesis of a comprehensive self-management-based PIPT model.

## Results

There is an increasing body of evidence suggesting the effectiveness of PIP approaches in managing painful musculoskeletal conditions. However, beliefs of clinicians, their training in using behavioral and psychological interventions, insufficient training, limited time, and concerns about not meeting patients'

expectations for the provision of conventional physical therapy have been reported as some of the difficulties in adopting PIP for the care of patients with musculoskeletal pain.

## Conclusions

The literature review suggests that the proposed PIPT model which is based on self- management, holds promise for assessing and managing chronic musculoskeletal pain. Future research priorities include evaluating the cost-effectiveness of the proposed model and developing an educational framework for physical therapists to optimize the implementation of the suggested practices.

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## Key words

chronic musculoskeletal pain, biopsychosocial model, cognitive behavioral therapy, psychologically informed physical therapy, self-management.

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# “Investigation of Factors Associated with High Levels of Kinesiophobia after Injury in Amateur and Professional Tennis Players”

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## Introduction

Kinesiophobia after an injury can negatively affect athletes' recovery (1,2). Despite its importance, the relationship between demographics, previous injuries, equipment, and kinesiophobia in tennis players has not been sufficiently studied.

## Aim

The aim of this study, conducted as part of Stella Moustaka's thesis, was to examine the relationship between factors such as age, gender, athletic experience, equipment, and the presence of previous injuries with the levels of kinesiophobia in tennis players. The study also aimed to provide recommendations for injury prevention and improving athletes' psychological support.

## Material and Methods

The study included 104 active tennis players (both amateurs and professionals) over 18 years old, who had experienced at least one injury in the past two years. Data was collected via an anonymous online questionnaire. Factors such as age, BMI, athletic and educational level, playing position, training load, number of injuries, and reinjuries were examined, while kinesiophobia levels were assessed using the Tampa Scale of Kinesiophobia. Statistical significance was set at a level of 0.05.

## Results

The data analysis showed that the severity of the injury and the history of reinjury were directly associated with increased levels of kinesiophobia. Athletes who suffered serious injuries exhibited greater fear of future injuries. Additionally, it was found that the longer the physiotherapy program lasted, the more the athletes' fear increased upon returning to the sport. Finally, equipment and court surface

played a significant role in the development of kinesiophobia, while poor technique and lack of warm-up did not seem to impact athletes' psychology as much.

## Conclusions

The study highlights the need to improve athletes' and coaching teams' education on recovery and injury prevention. Injury-related factors are crucial for athletes' psychology and their return to the sport. The importance of proper equipment selection and court surface is emphasized. Systematic practices in warm-up, cool-down, and proper technique training are also recommended to minimize serious injuries.

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**Key Words:** Tennis injuries, risk factors, kinesiophobia.

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# “The Effect of Forward Head Posture on Hand Grip Strength and Wrist Joint Proprioception from an Erect Position: A Case-Control Study”

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## Introduction

Forward head posture (FHP) is one of the most common cervical spine posture disorders (1). FHP is associated with negative outcomes, such as neck pain and premature cervical spine degeneration (1,2). It also appears to be linked to reduced grip strength (3).

## Aim

This study, conducted as part of Konstantinos Giourgas' thesis, aimed to investigate the effect of FHP on grip strength when measured in a standing position, as well as on wrist joint position sense.

## Material and Methods

A case-control study was conducted with 30 participants, aged 20.6(±1.30) years, divided into two groups of 15. One group included individuals with FHP, while the other consisted of individuals with normal posture. FHP was assessed using the craniovertebral angle (CVA), with an angle of less than 50° indicating FHP. An independent samples t-test was used for group comparison. Pearson's correlation coefficient (r) was applied to analyze the relationship between anthropometric characteristics and grip strength. Correlation analysis was also checked across the entire sample and by gender. The significance level was set at  $p < 0.05$ .

## Results

The results showed reduced grip strength in the FHP group and lower accuracy in repositioning the wrist to its initial position compared to the healthy group. However, these differences were not statistically significant (p-values 0.152 and 0.312, respectively). A moderate linear correlation was found between CVA and grip strength when correlation analysis was conducted separately for females and males (p-values 0.012 and 0.238, respectively).

## Conclusions

FHP appears to be associated with reduced grip strength but not with wrist joint position sense, and this association seems to apply to females.

Future studies should consider FHP as a contributing factor affecting grip strength rather than a causal one, and categorize participants into three groups based on posture: normal, mild FHP, and severe FHP (depending on CVA).

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**Key Words:** Forward head posture, hand grip, joint position sense

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## «COMPARATIVE STUDY OF LUMBAR MOBILIZATION AND MANIPULATION ON PRESSURE PAIN THRESHOLD IN CHRONIC LOW BACK PAIN»

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### ABSTRACT

#### Introduction

Evidence suggests that manual therapy techniques (mobilizations and manipulations) are equally effective with other conservative treatments in patients with non specific chronic low back pain (NS-CLBP) in decreasing pain, disability, and improve mobility of the lower back and the hip joint (1).

#### Purpose

The aim of this study is to compare two different techniques (mobilization and manipulation) across two sessions and to evaluate their effectiveness on pain, pain threshold, and range of motion (ROM) in patients with pain NS-CLBP.

#### Materials and Methods

In this cross-over clinical trial we recruited 27 participants with non-specific CLBP (age range 18 to 60 years). The techniques were randomly applied between two different intervention days. The Primary outcome measures were: a) pain threshold assessed with an algometer pain and pain and b) sagittal and frontal plane lower back ROM measured with a digital inclinometer.

#### Results

The results indicated no statistically significant differences between interventions in pressure pain threshold

( $p>0.05$ ), pain ( $p>0.05$ ) and lower back ROM ( $p>0.05$ ).

#### Conclusions

Conclusively, the selection of mobilization or manipulation as a treatment approach in patients with CLBP relies on the clinical reasoning of the therapist and the technique - mobilization or manipulation - risk stratification.

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**Key Words:** Non-specific low back pain, chronic low back pain, manipulation, mobilization, algometer

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## «INVESTIGATION OF PSYCHOSOCIAL FACTORS AMONG PROFESSIONAL DANCERS WITH CHRONIC MUSCULOSKELETAL PAIN»

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### ABSTRACT

#### Introduction

Professional dance is a physically demanding and competitive field where the pressure to achieve excellence increases the risk of injury and chronic musculoskeletal pain (CMP) (1,2). Dancers often ignore pain to maintain performance despite the physical and psychological strain (3). The interaction between mechanical strain, psychosocial factors, which significantly influence pain perception, and the competitive nature of the profession contributes to both the persistence of chronic pain and increased mental distress, affecting dancers' ability to meet the physical demands of their careers (4).

#### Purpose

To investigate the relationship between psychosocial factors and CMP in dance professionals.

#### Materials and Methods

38 professional dancers (97.4% female, age 30.6 ± 10.2) from 204 dance schools in Greece, with at least 2 years of dance experience and 3 months of CMP, participated in the study. People with vestibular disorders or autoimmune diseases were excluded. Participants completed the following validated questionnaires: the Multidimensional Pain Questionnaire in Professional Dance (MPQD), the Self-Estimated Functional Inability because of Pain for Dancers (SEFIP), the Depression Anxiety Stress Scale 21 (DASS-21), the Pain Catastrophizing Scale (PCS), the Central Sensitization Inventory (CSI), the Pittsburgh Sleep Quality Index (PSQI), the Tampa Scale for Kinesiophobia 17 (TSK-17), and the Pain Self-Efficacy Questionnaire (PSEQ). Data were collected through an anonymous online survey using Microsoft Forms. Statistical tools used were Pearson's coefficient correlation test, One-way

**Key Words:** chronic musculoskeletal pain, professional dancers, psychosocial factors, central sensitization

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ANOVA, and Independent sample t-test (SPSS, v29.0).

#### Results

63.1% of the sample showed high levels of central sensitization symptoms and moderate levels of overall psychological distress, while 94.7% of the cohort presented high levels of self-efficacy. The number of injuries per dancer displayed moderate positive correlation with PCS and low positive correlation with CSI. Dancer experience was negatively correlated with DASS, PCS and average pain intensity. Among, the psychosocial instruments, correlations were observed between TSK-17 and both CSI and PCS, while PSQI was at its best moderately associated with CSI, PCS and a subgroup of DASS.

#### Conclusions

These findings necessitate a holistic approach to address both the physical and psychosocial aspects of dancers with CMP.

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This study is a postgraduate thesis

## «Examination of the relationship between functional status, quality of life and psychological condition of Parkinson patients»

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### ABSTRACT

#### Introduction

Parkinson's disease (PD) is the 2nd most common neurodegenerative disorder (1), presenting both motor and non-motor symptoms (2). Due to the progressive evolution that characterizes the disease, the daily life of patients is affected in many areas, such as those of their functionality, quality of life and mental state (3).

#### Purpose

The present study examined the relationship between functional status, quality of life and mental state in patients with Parkinson's disease in Greece. The interaction of factors such as depression, anxiety and decreased functionality is crucial to the quality of life, and it can support the utilization of physiotherapy and therefore the increase of functional status to impact not only the motor symptoms of the disease, but also of the psychological and cognitive factors that affect the quality of life of these patients.

#### Materials and Methods

30 patients with PD from the Parkinson Patients and Cares Association, with a mean age of 69.07 years (SD=11.23) participated to the present study. We used the Berg Balance Scale (BBS) and the Five Times Sit to Stand (FTSTS) to assess the functional status, the Parkinson's Disease Questionnaire 39 (PDQ 39) to investigate the quality of life and the Hospital Anxiety and Depression Scale (HADS) to examine the mental status. To investigate the relationship between the functional status, quality of life and mental state in patients with Parkinson's disease, the program SPSS 28.0, the Spearman r correlation index and the  $\chi^2$  independence test were used.

#### Results

The results showed statistically significant correlations between the functional status and the quality of life in both tests of BBS ( $r=-0.696$ ,  $p<0.01$ ) and FTSTS ( $r=0.381$ ,  $p<0.05$ ), respectively. HADS had a statistically significant correlation with FTSTS ( $r=0.378$ ,  $p<0.05$ ), and depression with BBS ( $r=-0.454$ ,  $p<0.05$ ) and FTSTS tests ( $r=0.441$ ,  $p<0,05$ ), respectively. Finally, quality of life showed a statistically significant correlation with anxiety ( $r=0.457$ ,  $p<0.05$ ) and depression ( $r=0.618$ ,  $p<0.01$  respectively).

#### Conclusions

Quality of life, functional status and mental state in patients with Parkinson's disease are factors that show a significant correlation with each other. Increased rates of anxiety and depression are observed, as well as a reduced quality of life for these patients. The relationship between these variables underlines the need for holistic treatment of patients, and not a unilateral approach to their motor symptoms. Further studies with a larger sample need to be conducted, in order to confirm the present results.

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**Key Words:** Parkinson disease, functional status, quality of life, mental status

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## «Effects of eHealth exercise on children with chronic suppurative lung diseases»

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### Introduction

Children and adolescents with chronic suppurative lung diseases (CSLD) such as cystic fibrosis (CF) and non-cystic fibrosis bronchiectasis (NCFB) experience symptoms (e.g., chronic productive cough) (1) that affect health-related quality of life (HRQoL) (2). Using information and communication technologies through eHealth systems in exercise programs could support their delivery to pediatric patients and improve clinical outcomes.

### Purpose

The purpose of this systematic review was to investigate the effects of eHealth exercise programs on clinical outcomes in pediatric populations with chronic suppurative lung diseases.

### Materials and Methods

The following databases were searched from the inception to September 21, 2024, using relevant keywords: Scopus, Pubmed, Medline (via EBSCOhost), Web of Science, and ACM Digital Library. Inclusion criteria of the studies were: a) children and adolescents aged 0-18 years old with chronic suppurative lung diseases, and b) studies with exercise programs through the use of eHealth technologies. Two researchers independently screened the retrieved studies and assessed the methodological quality of the included studies using the Cochrane Risk of Bias for randomized studies (RoB2) and ROBINS-I for non-randomized studies tools. The quality of evidence was graded using the GRADE approach. A descriptive synthesis of the findings was performed, as meta-analysis was not possible due to study heterogeneity.

### Results

From a total of 2341 studies, seven studies performed exercise programs using active video

games (n=3), live videoconferencing (n=3), and digital spirometer (n=1) lasting from 3 to 12 weeks. Five studies had participants with CF. Results showed improvements in functional and exercise capacity, lung function, peripheral and respiratory muscle strength, and HRQoL after an eHealth exercise program compared to usual care, airway clearance, or nothing. However, most studies had a considerable risk of bias.

### Conclusions

eHealth exercise programs can improve the aforementioned clinical outcomes in children and adolescents with CF. Further research is needed for the pediatric population with NCFB, as well as on the use of eHealth compared to conventional exercise programs.

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**Key Words:** bronchiectasis, cystic fibrosis, eHealth, exercise programs, pediatrics

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## PHYSICAL ACTIVITY AND INDICES OF PHYSICAL WELL-BEING IN CHILDREN AND ADOLESCENTS WITH TRISOMY 21

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**Background:** Trisomy 21 (Down syndrome) is the most common genetic disorder, which is due to a chromosomal abnormality and presents various deviations in areas such as mental and motor level [1,2,3]. The presence of extra information corresponding fully or partially to chromosome 21 affects the development of children with trisomy 21, and abnormal gene expression leads to changes in brain function [1,4]. The overall prevalence of the syndrome is one (1) to two (2) per thousand (1,000) live births, although the prevalence may vary among racial or ethnic groups [5,6,7].

**Purpose:** The purpose of this research is to highlight the discrepancies in the balance ability, the strength of the upper limbs and to what extent they affect the quality of life of children and adolescents with trisomy 21.

**Material and Methods:** Eighteen (18) children and adolescents with trisomy 21 participate in the research, with three (3) being excluded due to exclusion criteria. Fifteen (15) children and adolescents with trisomy 21 were finally included, of which four (4) were boys and eleven (11) were girls. Measurements were performed through weighted balance tests (Pediatric Balance Scale, Time Up and Go test), with weighted upper extremity strength measuring tools [hydraulic handgrip dynamometer (Jamar) and electronic handgrip dynamometer (Micro Fet 4)]. The statistical analysis was performed with the spreadsheet (Excel). A study protocol was drawn up in the pediatric department of the Apostolos Fokas Center for Developmental Pediatrics of G.N.Th. Hippocrates in the pediatric population with trisomy 21.

**Result:** The recording of strength results demonstrates the most important deviations in the total of children and adolescents with trisomy 21 compared to the general population, regarding the strength of the upper limbs. The balance ability of all children with trisomy 21 who participated in the research, shows deviations related to postural control compared to typically developing children.

**Conclusions:** Discrepancies in the scoring of tools such as the Pediatric Balance Scale demonstrate problems in functional balance and movement disorders and more specifically posture and balance as categorized by the ICF model. This research is one of the first in the world literature to examine the correlation of upper limb strength with the balance ability of children and adolescents with trisomy 21.

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**Key Words:** Trisomy 21, Dynamometer, Jamar, MicroFet 4, Pediatric Balance Scale, Time Up and Go Test.

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# «DEVELOPMENT OF A PHYSIOTHERAPY EVALUATION PROTOCOL AND PILOT INVESTIGATION OF ITS APPLICATION IN DOGS WITH OSTEOARTHRITIS IN THE HIP AND KNEE JOINT»

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## ABSTRACT

### Introduction

Osteoarthritis(OA) is a very common condition that occurs in companion animals, including dogs (1). Patients with OA experience limited activity, reduced ability to perform, pain and discomfort and reduced quality of life (2). The use of valid and reliable outcome measures is very important for accurate physiotherapeutic evaluation and for studying the effectiveness of new interventions. A variety of subjective and objective tools are available for the evaluation of dogs presenting with OA (3). In Greece, there are no studies or tools that have been cross-culturally adapted into the Greek language for the evaluation of dogs with OA from a physiotherapeutic point of view.

### Purpose

The aim of this study is to develop a comprehensive, easily applicable, reliable and valid protocol for the physiotherapeutic evaluation of dogs with OA at the hip and knee.

### Materials and Methods

The Canine Brief Pain Inventory (CBPI) and Liverpool Osteoarthritis in Dogs (LOAD) questionnaires were adapted cross-culturally into Greek and their psychometric properties were examined in a sample of 17 dogs with clinical pain symptoms due to OA. In addition, the reliability of the objective measurements of goniometry and limb circumference using a tape measure was investigated in a sample of 11 healthy dogs. Finally, this assesemnt protocol was tested in in a pilot sample of 4 dogs with OA in hip or knee joints to test its applicability and its feasibility. The internal consistency of the two questionnaires was examined using Cronbach's  $\alpha$  coefficient and their validity was examined by investigating the correlation between them using Pearson's correlation coefficient. The test-retest reliability of both the questionnaires and the objective measures was examined using the intraclass correlation coefficient (ICC), standard error of measurement (SEM) and smallest detectable difference (SDD). Finally, the significance level ( $\alpha$ ) was set at 0.05.

### Results

Regarding retest reliability, the ICC index was 0.97 for CBPI and 0.97 for LOAD, findings suggesting excellent stability of the instruments between repeated measurements. The Cronbach's  $\alpha$  was 0.98 for both questionnaires, demonstrating strong internal consistency. Angle measurement appeared to have low ( $ICC_{hip\ extension}=0.4$ ) to very good intra-rater reliability ( $ICC_{knee\ flexion}=0.7$ ,  $ICC_{knee\ extension}=0.79$ ,  $ICC_{hip\ flexion}=0.8$ ). Finally, the intra-examiner reliability of the thigh circumference measurement proved to be excellent ( $ICC= 0.99$ ).

### Conclusions

The evaluation protocol appears to be valid and reliable and its application to dogs with OA in their hind limbs is recommended. Further studies are needed to determine more aspects of the reliability and validity of each measurement tool and to develop a more comprehensive physical therapy evaluation protocol, with more outcome measures, in dogs with OA.

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### Key Words:

Osteoarthritis, canine, evaluation, Canine Brief Pain Inventory, Liverpool Osteoarthritis In Dogs

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## «Investigating the rehabilitation needs of community-dwelling adults with spinal cord injury paraplegia in Greece: quantitative and qualitative audit»

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### ABSTRACT

#### Introduction

Spinal cord injury (SCI) can bring about physical, psychological, and social changes. (1) The goal of rehabilitation is to maximize independence in all aspects of life and the return to a productive and fulfilling life. (2)

#### Purpose

The purpose of the study is to investigate the lived experience of people with paraplegia due to SCI, living in the community in Greece and to highlight the unmet rehabilitation needs, with the aim of improving the quality of life and strengthening social participation.

#### Materials and Methods

Quantitative and qualitative data collection was applied in the present study. Fourteen adults with paraplegia due to SCI participated. Quantitative data were collected via three standardized questionnaires on sociodemographic and other variables related to health condition, functional ability, social participation and quality of life. Qualitative data were collected via face-to-face semi-structured interviews that were digitally audio recorded and transcribed verbatim. Three researchers collaborate in the present study: a) the primary researcher who conducted the interview, and the completion of the questionnaires, b) the observer who noted non-verbal elements of the participants' behavior during the interviews, and c) a third researcher that assisted with data analysis.

#### Results

The researchers' first assessments after conducting the interviews and completing the questionnaires show that previous physical

activity, current motivation, health status and age seem to influence the compliance of people with SCI in a physiotherapy program. In the primary stages of text analysis, themes and categories related to various challenges of everyday life are revealed.

#### Conclusions

The study is expected to capture the lived experiences of people with SCI paraplegia living in the community in Greece and highlight unmet rehabilitation needs with the aim of improving quality of life and enhancing social participation. Thus, fertile ground is created for the creation of new physiotherapy interventions that focus on the functional deficits of these individuals.

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**Key Words:** spinal cord injury, rehabilitation needs, social participation, quality of life, physiotherapy

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