fizjoterapia polska

POLISH JOURNAL OF PHYSIOTHERAPY

OFICJALNE PISMO POLSKIEGO TOWARZYSTWA FIZJOTERAPII

THE OFFICIAL JOURNAL OF THE POLISH SOCIETY OF PHYSIOTHERAPY

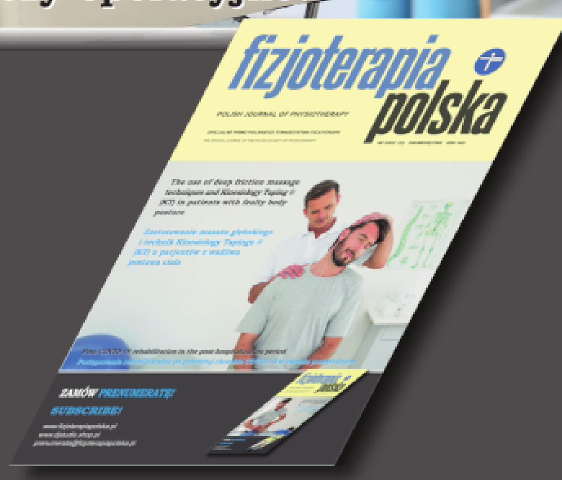
NR 4/2022 (22) DWUMIESIĘCZNIK ISSN 1642-0136

Efficacy of ultrasound in diagnosis and treatment of the shoulder – A systematic review

Przydatność ultrasonografii w fizjoterapii barku – przegląd literatury

Patellar dislocation – conservative or surgical treatment

Zwichnięcie rzepki – leczenie zachowawcze czy operacyjne?



Zawód Fizjoterapeuty dobrze chroniony

Poczuj się bezpiecznie

INTER Fizjoterapeuci
Dedykowany Pakiet Ubezpieczeń

Zaufaj rozwiązaniom sprawdzonym w branży medycznej.
Wykup dedykowany pakiet ubezpieczeń INTER Fizjoterapeuci, który zapewni Ci:

- ochronę finansową na wypadek roszczeń pacjentów – NOWE UBEZPIECZENIE OBOWIĄZKOWE OC
- ubezpieczenie wynajmowanego sprzętu fizjoterapeutycznego
- profesjonalną pomoc radców prawnych i zwrot kosztów obsługi prawnej
- odszkodowanie w przypadku fizycznej agresji pacjenta
- ochronę finansową związaną z naruszeniem praw pacjenta
- odszkodowanie w przypadku nieszczęśliwego wypadku

Nasza oferta była konsultowana ze stowarzyszeniami zrzeszającymi fizjoterapeutów tak, aby najskuteczniej chronić i wspierać Ciebie oraz Twoich pacjentów.

► **Skontaktuj się ze swoim agentem i skorzystaj z wyjątkowej oferty!**

Towarzystwo Ubezpieczeń INTER Polska S.A.
Al. Jerozolimskie 142 B
02-305 Warszawa

www.interpolska.pl

inter UBEZPIECZENIA

AKTYWIZACJA OSÓB PO URAZACH RDZENIA

Po Urazie Rdzenia to ogólnopolski projekt skierowany do osób, które doznały urazu rdzenia kręgowego. Jego celem jest wielopłaszczyznowe wsparcie na drodze do odzyskania możliwie największej sprawności.

W ramach programu oferujemy pacjentom:

- Opiekę Menadżera Rehabilitacji
- Pozyskanie funduszy na rehabilitację i zakup sprzętu
- Wsparcie psychologiczne
- Konsultacje specjalistów
- Rehabilitację neurologiczną w ośrodkach na terenie kraju
- Pomoc w doborze zaopatrzenia
- Wsparcie w likwidacji barier architektonicznych
- Doradztwo zawodowe

Skontaktuj się z nami i zapytaj o bezpłatne egzemplarze Poradnika dla osób po urazie rdzenia do Twojej placówki

Masz pytanie odnośnie programu. Napisz do nas lub skontaktuj się telefonicznie z naszymi menadżerami rehabilitacji:

+48 881 035 005
lub +48 793 003 695

biuro@pourazierdzenia.pl
www.pourazierdzenia.pl

Po Urazie Rdzenia

mindray
healthcare within reach

ULTRASONOGRAFIA

W FIZJOTERAPII

NOWOŚĆ W OFERCIE

ASTAR.

PhysioGo.Lite SONO

NIEWIELKIE URZĄDZENIE
EFEKTYWNA **TERAPIA ULTRADŹWIĘKOWA**

Zaawansowana technologia firmy Astar to gwarancja niezawodności i precyzyjności parametrów. Urządzenie, dzięki gotowym programom terapeutycznym, pomaga osiągać fizjoterapeucie możliwie najlepsze efekty działania fal ultradźwiękowych.

Głowica SnG to bezobsługowe akcesorium o dużej powierzchni czoła (17,3 cm^2 lub 34,5 cm^2 w zależności od wybranego trybu działania). Znajduje zastosowanie w klasycznej terapii ultradźwiękami, fonoferezie, terapii LIPUS i zabiegach skojarzonych (w połączeniu z elektroterapią).

wsparcie merytoryczne
www.fizjotechnologia.com

ul. Świt 33
43-382 Bielsko-Biała

t +48 33 829 24 40
astarmed@astar.eu

www.astar.pl

POLSKI PRODUKT **WYBIERASZ I WSPIERASZ**

Dr. Comfort®

Nowy wymiar wygody.

Obuwie profilaktyczno-zdrowotne o atrakcyjnym wzornictwie

NAGRODA POLSKIEGO TOWARZYSTWA REHABILITACJI

ACCEPTED
AMERICAN PODIATRIC MEDICAL ASSOCIATION

APROBATA AMERYKAŃSKIEGO MEDYCZNEGO STOWARZYSZENIA PODIATRYCZNEGO

CE **WYRÓB MEDYCZNY**

Stabilny, wzmocniony i wyściełany zapiętek
Zapewnia silniejsze wsparcie łuku podłużnego stopy

Miękki, wyściełany kołnierz cholewki
Minimalizuje podrażnienia

Wyściełany język
Zmniejsza tarcie i ulepsza dopasowanie

Lekka konstrukcja
Zmniejsza codzienne zmęczenie

Antypoźlizgowa, wytrzymała podeszwa o lekkiej konstrukcji
Zwiększa przyczepność, amortyzuje i odciąża stopy

Zwiększona szerokość i głębokość w obrębie palców i przodostopia
Minimalizuje ucisk i zapobiega urazom

Wysoka jakkość materiałów - oddychające siatki i naturalne skóry
Dostosowują się do stopy, utrzymują je w suchości i zapobiegają przegrzewaniu

Ochronna przestrzeń na palce - brak szwów w rejonie przodostopia
Minimalizuje możliwość zranień

Trzy rozmiary szerokości | **Podwyższona tęgość** | **Zwiększona przestrzeń na palce**

WSKAZANIA

• haluksy • wkładki specjalistyczne • palce młotkowate, szponiaste • cukrzyca (stopa cukrzycowa) • reumatoidalne zapalenie stawów • bóle pięty i podeszwy stopy (zapalenie rozcięgna podeszwowego - ostroga piętowa) • płaskostopie (stopa poprzecznie płaska) • bóle pleców • wysokie podbicie • praca stojąca • nerwiak Mortona • obrzęk limfatyczny • opatrunki • ortezy i bandaże • obrzęki • modzele • protezy • odciski • urazy wpływające na ścięgna, mięśnie i kości (np. ścięgno Achillesa) • wrastające paznokcie

KALMED
Iwona Renz, Poznań

ul. Wilczak 3
61-623 Poznań
tel. 61 828 06 86
fax. 61 828 06 87
kom. 601 640 223, 601 647 877
e-mail: kalmed@kalmed.com.pl
www.kalmed.com.pl

www.butydlazdrowia.pl **www.dr-comfort.pl**

Sukces czy porażka? Czyli jak wygląda sytuacja w zakresie szczepień ochronnych w Polsce?

Cztery uczelnie – Centrum Medyczne Kształcenia Podyplomowego, Warszawski Uniwersytet Medyczny, Akademia Leona Koźmińskiego i Uniwersytet SWPS zorganizowały konferencję naukową w ramach Projektu „Budowanie zaufania do szczepień ochronnych z wykorzystaniem najnowszych narzędzi komunikacji i wpływu społecznego”.
Podczas czterech paneli dyskusyjnych eksperci, naukowcy, lekarze, psycholodzy, przedstawiciele instytucji publicznych dyskutowali na temat szans i wyzwań stojących przed system szczepień w Polsce.

Nie da się zaprzeczyć faktom – szczepienia ochronne są najefektywniejszą metodą zwalczania chorób zakaźnych. Podnoszenie zaufania do szczepień, które przekłada się na poziom wyszczepienia populacji, jest więc kluczowym wyzwaniem stojącym przed wszystkim odpowiedzialnymi za zdrowie publiczne w Polsce.

Dużym sukcesem i krokiem w dobrym kierunku było wprowadzenie szczepień w aptekach – podkreślił prof. Jarosław Pinkas, Konsultant Krajowy w dziedzinie zdrowia publicznego.

Niemniej, mimo szeroko prowadzonej kampanii medialnej, Polska należy do krajów o najniższym poziomie wszczepienia przeciw COVID-19 w Europie (niespełna 60% populacji zostało w pełni zaszczepionych). Co roku w naszym kraju przeciw wirusowi grypy szczepi się jedynie 4-6% osób. Według danych PZH-NIPZ liczba uchyleń od szczepień obowiązkowych wśród dzieci w okresie od 2016 do 2020 roku wzrosła 2-krotnie z 23 tys. do 50.5 tys.

„Szczepienia przeciwko grypie u pracodawców bardzo zmniejszają absencję w pracy, ta sama prawidłowość dotyczy szczepień rotawirusowych” – mówił prof. Marcin Czech

Z danych uzyskanych przez Warszawski Uniwersytet Medyczny wynika, że postawy mieszkańców Polski wobec szczepień nie są spójne. Może to w przyszłości spowodować dalszy spadek poziomu wyszepienia populacji, a w dalszej perspektywie wzrost zagrożenia epidemiologicznego.

W ramach panelu prowadzonego przez Uniwersytet SWPS zastanawiano się nad przyczynami postaw wobec szczepień. Pierwszym skojarzeniem, jakie większość Polaków wypowiada po haśle „szczepienia” jest „koronawirus”. I choć rzeczywiście od końca 2020 roku szczepienia przeciwko COVID-19 stały się jednym z bardzo ważnych elementów debaty publicznej, to przecież rosnąca liczba osób uchylających się od szczepień na takie choroby jak odra czy krztusiec była ważną kwestią społeczną już przed marcem 2020 roku.

Jednym z kluczowych wyzwań stojących przed system szczepień w Polsce jest walka z fake newsami, podkreślali eksperci Akademii Leona Koźmińskiego.
Czy dezinformację naukową można interpretować w kategoriach cyberwojny?
Czy jest to zagrożenie porównywalne z katastrofą klimatyczną, bądź rozwojem technik AI? Jaką rolę odgrywają w tym procesie media społecznościowe? To pytania z którymi musimy się jak najszybciej zmierzyć.

Mimo wszystko wysoka wyszczepialność w Polsce to sukces wszystkich profesjonalistów medycznych i osób działających na rzecz zdrowia publicznego. Wciąż zdecydowana większość Polaków dokonuje właściwych wyborów zdrowotnych. To optymistyczny wniosek płynący z konferencji CMKP, WUM, SWPS i ALK. Jednak nic nie jest dane raz na zawsze – pojawiające się wyzwania powinny mobilizować lekarzy, naukowców, edukatorów, przedstawicieli administracji publicznej do szukania nowych sposobów dotarcia z komunikatem zachęcającym do szczepień i podejmowania zdecydowanych działań na rzecz walki z dezinformacją.

fizjoterapia polska
nr 4/2022 (22)

Effect of lumbar repositioning feedback training on pain and joint position sense in participants with chronic mechanical low back pain

Wpływ treningu repozycjonującego odcinek lędźwiowy na odczuwanie bólu i pozycję stawu u pacjentów z przewlekłym mechanicznym bólem krzyża

Mai Hassan Ahmed Desouki[1(A,B,C,D,E,F,G)], Alaa Eldin Balbaa[2,3(B,C,D,E)], Mohamed Samir Gobba[4(B,E,F)], Ahmed M. El Melhat[5(E,F)], Mohammed S. Abdelsalam[2(A,B,C,D,E,F,G)]

[1]Department of Physical Therapy for Musculoskeletal Disorders and its Surgery, Faculty of Physical Therapy, October 6 University, Egypt
[2]Department of Physical Therapy for Musculoskeletal Disorders and Its Surgery, Faculty of Physical Therapy, Cairo University, Cairo, Egypt.
[3]Faculty of Physical Therapy, Nahda University, Beni Sueif, Egypt.
[4]Department of Orthopedic Surgery, Faculty of Medicine, Cairo University, Egypt
[5]Department of Physical Therapy, Faculty of Health Sciences, Beirut Arab University, Lebanon

Abstract
Objective. The aim of this study was to investigate the effect of lumbar repositioning feedback training (LRFT) on pain and joint position sense (JPS) in patients with chronic mechanical low back pain (CMLBP). Materials and Methods. Twenty-four patients, from both genders, suffering from CMLBP were assigned randomly into 2 equal groups. The lumbar repositioning feedback training (LRFT) group who received lumbar repositioning feedback training and conventional proprioception exercises on Swiss ball, and control group who received conventional proprioception exercises on Swiss ball only. Pain was assessed using visual analogue scale (VAS), and joint position sense was assessed using absolute repositioning error (ARE). All patients received treatment twice per week for 6 weeks. Assessments were carried out pre and post experimentally. Results. Pre- post treatment evaluations comparisons showed improvement of pain and joint position sense post- treatment compared to pre-treatment within both groups. However, pre-treatment between groups comparisons were non-significant, with significant post- treatment improvements of pain and joint position sense in favor of LRFT compared to control group. Conclusion. Patients in LRFT group showed significant pain reduction and improvement in joint position sense in patients with CMLBP than did patients in control group. Thus, LRFT might be a suggested component of treatment programs in managing patients with CMLBP.

Keywords
lumbar repositioning feedback training, chronic mechanical low back pain

Streszczenie
Cel. Celem niniejszego badania było zbadanie wpływu treningu repozycjonującego odcinek lędźwiowy (LRFT) na odczuwanie bólu i pozycji stawu (JPS) u pacjentów z przewlekłym mechanicznym bólem krzyża (CMLBP). Materiały i metody. Dwudziestu czterech pacjentów obu płci cierpiących na CMLBP zostało losowo przydzielonych do 2 równych grup. Grupa poddawana treningowi LRFT, wykonywała również konwencjonalne ćwiczenia propriocepcji na piłce Swiss, natomiast grupa kontrolna wykonywała jedynie konwencjonalne ćwiczenia propriocepcji na piłce Swiss. Ból oceniano za pomocą wizualnej skali analogowej (VAS), a wyczucie pozycji stawu oceniano za pomocą bezwzględnego błędu repozycjonowania (ARE). Wszyscy pacjenci byli poddawani leczeniu dwa razy w tygodniu przez 6 tygodni. Oceny przeprowadzono przed i po badaniu. Wyniki. Porównanie ocen przed leczeniem wykazało poprawę odczuwania bólu i pozycji stawów po leczeniu w porównaniu ze stanem przed leczeniem w obu grupach. Jednak wyniki porównania między grupami przed leczeniem były nieistotne, z istotną poprawą odczuwania bólu i pozycji stawów po leczeniu na korzyść grupy poddawanej treningowi LRFT w porównaniu z grupą kontrolną. Wniosek. Pacjenci z CMLBP z grupy LRFT wykazali znaczne zmniejszenie bólu i poprawę pozycji stawów w porównaniu do pacjentów z grupy kontrolnej. Dlatego LRFT może być sugerowanym elementem programów leczenia w postępowaniu z pacjentami z CMLBP.

Słowa kluczowe
trening repozycjonujący odcinek lędźwiowy, przewlekły mechaniczny ból krzyża

doi.org/10.56984/8ZG1A6Np0

Introduction

Chronic mechanical low back pain (CMLBP) has been defined as a chronic lower back pain syndrome of more than 12 weeks duration [1]. It represents a leading cause of disability worldwide and considered as a major socioeconomic problem [2]. Others claimed that such disorder, along with its high prevalence and incidence, represents a huge burden on health systems along with its economic and psychological impact [3]. Almost any adult individual has reports experiencing a kind of low back pain in her/his life and recovering in a one-year period. However, a percentage of theses individual report extension of signs and symptoms with pain reports of low to medium intensity and thus considered as chronic [4].

In absence of vision feedback, joint sense and awareness of body parts are sensed consciously and unconsciously through proprioceptors, such sense is defined as proprioception [5]. Paraspinal muscles are rich in proprioceptors, particularly spindles, monitoring midrange spinal motion [6]. Low back pain participant individuals have been shown to present with structural (i.e., visible muscle atrophy), and functional (i.e., asynchronous neuromuscular activation between the both superficial and deep paraspinal muscles) alterations in the trunk musculature [7]. These associated disorders have been claimed to cause improper motor control secondary to proprioceptive variations and deficits in tactile discriminatory acuity [8]. In the same context, improvement in motor control has been correlated with the degree of proprioceptive acuity [9]. The degree of joint repositioning error [JRE] has been considered among the measures of proprioceptive assessment [10]. This is why; the main purpose of this present study was to investigate the influence of lumbar repositioning feedback training on the amount of low back pain, and JRE as indicators of proprioceptive acuity in individuals with CMLBP.

Materials and Methods

Design

A randomized pre-test, post-test control trail was carried out at the outpatient's clinics of the Faculty of physical therapy, Cairo University. It was conducted to investigate the effect of Lumbar Repositioning Feedback Training On Pain and Joint Position Sense in Participants with Chronic Mechanical low back pain, Data were collected pre and post treatment from November 2020 to August 2021.Research Ethics Committee before study commencement [No. P.T.REC/012/002729 at the date of 17/5 /2020. Clinical trial registration identifier record number was NCT05047614 that was sent on 16 September 2021.

Participants

Twenty-four participants (11 females, and 13 males), with CMLBP were recruited and randomly assigned into 2 equal numbered groups; Lumbar repositioning feedback training (LRFT) group and control group. Participants were recruited from outpatient's clinics of the Faculty of physical therapy, Cairo University, Egypt. All participants were complained from low back pain for at least 12 weeks or more, their ages ranged from 35 to55 years old, and BMI ranged from 24-28kg/m2. On the other hand, participant with diabetic peripheral neuropathies, history of sciatica, spinal or lower limb deformities, lumbar spine surgeries, neurological or inner ear disorders that might affect balance and proprioception, or visual disorders were excluded from participation in this study.

Randomization

The recruited participants were randomly assigned, after signing consent form, into two equal groups Randomization software (random.org) was used to generate two sets of numbers from one to twenty-four without repetition. A blind draw was done to select one set of numbers for each of the study groups. Randomization was carried out using numbered cards in concealment opaque envelopes; each participant drew an envelope to be allocated to the related group.

Interventions

Group (A) (experimental group) included 12 participants who received lumbar repositioning feedback training plus traditional lumbar proprioception training on Swiss ball, whereas Group (B) (control group) included 12 participants who received the lumbar proprioception training on Swiss ball alone. Additionally, all participants received two treatment sessions per week for 6 consecutive weeks. All participants were instructed not to use analgesic during the period of the study and were assumed they did so.

Outcome measures

Outcome measures were recorded before and after 6 weeks of treatment program.

Visual analogue scale (VAS)

It was used to evaluate pain intensity pre- and post-treatment for both groups (A & B). The VAS is well-known as valid measurement tool for recording pain intensity that can provide wide-acceptance, validity, and reliability estimation of pain intensity. The participant's pain intensity was recorded by using a self-reported score with single handwritten mark placed at one point along the length of a ten cm line ranged from the left side zero score (no pain) to the right side ten score (maximum pain) [11]. Each participant was asked to mark a point on a 10 mm line that best translated perceived pain intensity. Examiner measured the line from the zero end to the reported mark to the nearest millimeters.

Absolute repositioning error

Participants were asked to recall the starting neutral position and keep it for 5 seconds; consequently, they were asked to mobilize the pelvis from the full anterior pelvic tilt to the full posterior one, holding each position at this ended range for 5 seconds, and finally ending by returning to the starting position. The distance from the starting point, considered as the repositioning error, was measured to the nearest millimeters using the laser point marked on the measuring tape. Each participant was allowed to rehearse for two times before the recorded examination started. At 1 minute interval, each subject did three repetitions and the mean value of three readings was considered as the absolute repositioning error (ARE) for the analysis [12].

doi.org/10.56984/8ZG1A6Np0

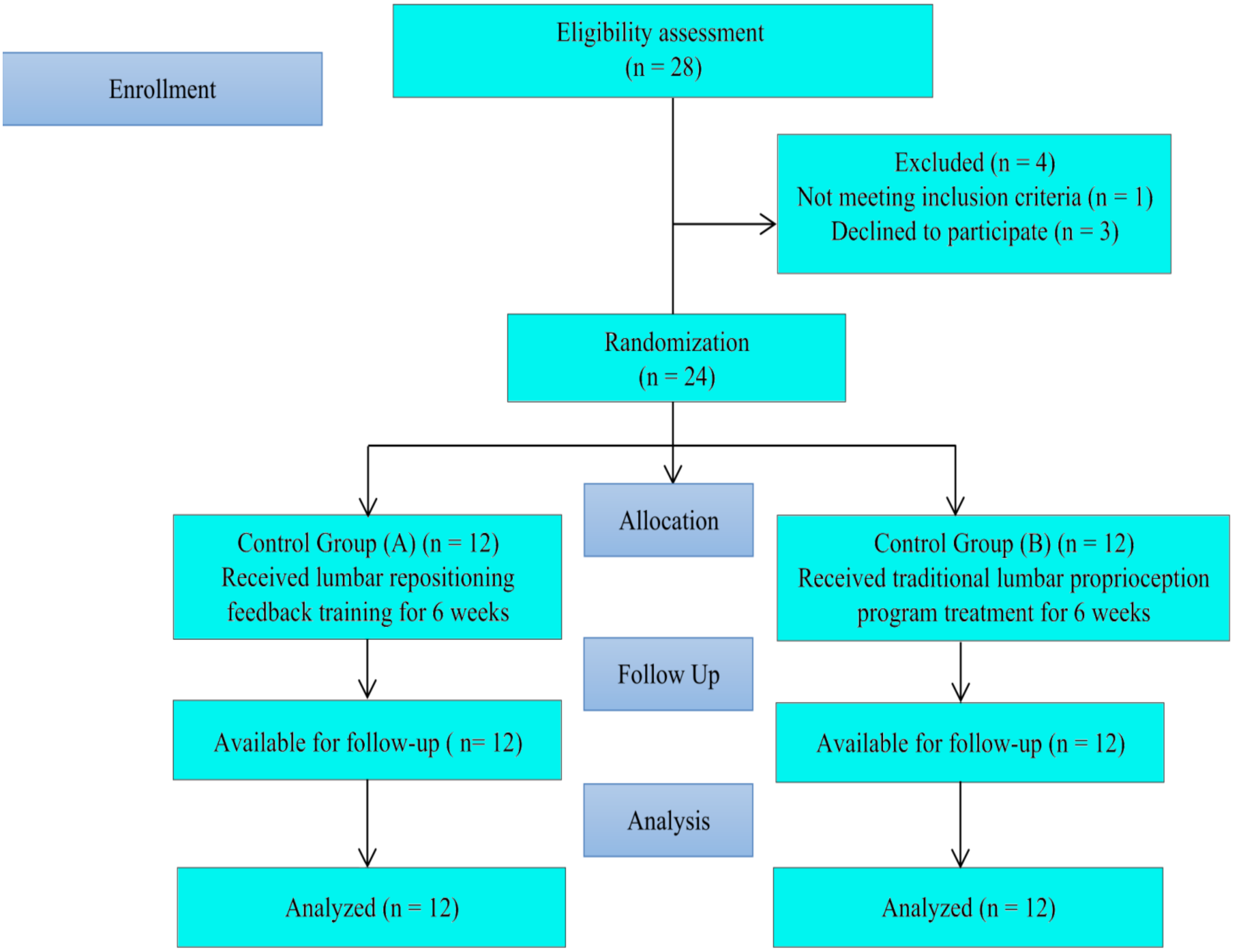


Figure 1. Flow chart of the study

The difference between the participant's representation of the target position and the actual target position, quantified as absolute error (AE), the unsigned difference between positions; The target location was taken as "0 cm," and any divergence (−) from it was recorded as (−) undershooting and (+) overshooting.

Treatment procedures

Training was implied twice per week for 6 weeks. Participants assigned for the LRFT group undertook lumbar reposition feedback training using feedback laser tracker. Two target positions were set, 3 cm in both anterior and posterior pelvic tilting directions. Participant was asked to move as slowly as possible to the target position determined by the examiner. When the participant reached the target position, the position was maintained a period of 5 seconds, then returned to neutral position [13] The participant was asked to repeat it 10 times per set for 5 sets per session for each target position.

Participants in both groups received proprioception training on Swiss ball. In LRFT group, Swiss ball training followed lumbar reposition feedback training. During training on Swiss ball, participants were asked to balance on it while the therapist pushed the ball on the ground then proceed to push it down on a foam training mat. Participants were also asked to outreach, and perform trunk shifting forwards, backwards and sideways while balancing on the ball. Participants were asked to exercise with eyes closed to block any visual feedback [14]. Training was carried out for a total of 55 minutes [15].

Statistical analysis

Descriptive statistics were conducted to describe the data as means ± standard deviation. The Shapiro Wilk test of normality was done at first to assess the distribution of data before treatment. Paired t-test was carried out for comparison of mean values of variables before and after interventions in each group. Independent t-test was conducted to compare the mean values of variables between the two groups at the baseline and post interventions. The significance level for all statistical tests was set at $p \leq 0.05$. The Statistical analysis was performed through the statistical package for social studies (SPSS) version 25 for windows.

doi.org/10.56984/8ZG1A6Np0

Results

The main aim of the present study was to investigate the consequence of lumbar repositioning feedback training on proprioception and pain in subjects with CMLBP. Participants' demographic data were recorded, and compared between both groups using independent t- test. No significant differences were detected between participants allocated to both groups regarding age, weight, height, and body mass index (Table 1).

Table 1. Demographic data of participants in LRFT and control groups

	LRFT group Mean ± SD	Control group Mean ± SD	p- value
Age [years]	41.33 ± 5.79	40.33 ± 4.52	0.642
Weight [kg]	75.33 ± 6	77.75 ± 6.6	0.358
Height [cm]	169.83 ± 6.71	171.08 ± 6.31	0.643
BMI [kg/m²]	26.05 ± 0.72	26.28 ± 0.89	0.505

LRFT: lumbar repositioning feedback training; Data are expressed as Means ± SD. BMI: Body mass index, NS P > 0.05 = non-significant, P = Probability.

Statistical analysis showed no statistically significant differences (P > 0.05) between subjects in both groups concerning outcome variables at baseline (pre-intervention) regarding Pain and absolute repositioning error (ARE) (Table 2). Moreover, post-test comparison between both groups showed significant statistical difference (p < 0.05) regarding the Pain and absolute repositioning error (ARE) in favour to LRFT group. The within-group comparison showed significant improvement (decrease) in Pain, with a percentage of improvement (53.64% and 4.51%), and absolute repositioning error (ARE) with a percentage of increase (39.53% and 14.28%) in study and control groups, respectively, after treatment in comparison to the pre-treatment values.

Table 2. Comparison between mean values of pain and joint position sense in between and within LRFT and control groups

		LRFT group Mean (+SD)	Control group Mean (+SD)	Between groups comparisons Sig.
Pain	Pre	8.24 ± 0.79	8.86+0.63	0.350
	Post	3.82 ± 0.92	8.46+0.63	0.0001*
	Within groups comparisons	0.0001**S	0.001**S	
JPE	Pre	0.86 ± 0.16	0.91 ± 0.09	0.991
	Post	0.52 ± 0.11	0.78 ± 0.11	0.0001*
	Within groups comparisons	0.0001**S	0.002**S	

*LRFT: lumbar repositioning feedback training; *Between groups difference, ** Comparison between pre and post-treatment values in each group, S: significant*

Discussion

The study clearly revealed that treatment with lumbar repositioning feedback and proprioception training on Swiss ball for 6 weeks in participants with CMLBP significantly decreased pain and improved proprioception compared to proprioception training on Swiss ball training alone.

It was suggested that proprioception deficits might stem from changes in the sensory motor cortex linked to distortions in body schema. Pain may be one of the factors that drive these changes [16]. On the other hand, others reported that chronic low back pain can be triggered by proprioceptors discrepancy. They suggested that such proprioceptive deficit could be the result of increased muscle spindle sensitivity, leading to incorrect signaling about spinal position [17]. In the same context, an assumption was reported about the association between pain and proprioception in participants with LBP, and suggested that such disorder is probably linked to modulation of afferent proprioceptive signals provided by the muscle spindles and interactions between pain and proprioceptive inputs within the cortex [18]. Hence, improvement of pain intensity and proprioception acuity in CMLBP participants in this study are likely related to one another.

It has been found that proprioceptive output might be disturbed subsequent to associated traumatic changes in tissues, muscular fatigue and nociceptors triggering, which subsequently inhibits motor control. Such noxious stimuli will probably lead to enhanced activation of the sympathetic nervous system thus depressing the information flow from muscle spindles and ending by deterioration of proprioceptive information stream through the spinocortical axis [19]. This might represent a mechanism contributing to observed impairments in trunk proprioception in LBP participants.

doi.org/10.56984/8ZG1A6Np0

Rungthip et al [20] showed that the Core stabilization exercise group had significant improvements in lumbar repositioning sense, reduced pain level and functional disability. Lumbar joint repositioning error significantly reduced, suggests that lumbar joint reposition sense deteriorates in participants with low back pain who do not exercise their core muscles. CSE may improve lumbar joint position sense. As increases in muscle activity stimulate muscle spindles and joint receptors; the accuracy of the sensory integration procedure is enhanced empowering precise joint repositioning.

Lumbar repositioning feedback training applied in the LRFT group in the current study emphasized on pelvic movements in sagittal plane, resulting in both lengthening and shortening of related soft tissue structures. This training might have worked through normalizing feedback from muscles and other soft tissues structures during pelvic tilting. An alternate explanation of the effect of LRFT on both pain and proprioception acuity in this study might be due to the improvement caused by the coordination of movements of the pelvis and lower back. The repetition of training sessions over the study duration might have facilitated such improvement. Reduction of pain reported with LRFT of low back pain participants in this study suggests marked improvement in joint position error, in addition to the direct beneficial effect assured by the potential improvement of neuromuscular control and motor performance. It has been reported that the significant difference in the lumbar repositioning accuracy between the control and the low back pain individuals can be attributed to the fact that pain may result in coordination dysfunction during dynamic tasks, with alteration in the normal agonist-antagonist activity [21]. They, further concluded a high correlation between the presence of pain and the disturbances that occur in both motor performance and neuromuscular control.

Comparison between groups showed improvement in pain and proprioception acuity in the LRFT group compared to the control group. Despite that, the control group received proprioception exercises on Swiss ball similar to that performed in LRFT group. Thus, it seems that LRFT performed in the same manner in both evaluation and training enhanced the outcomes further in LRFT groups [21].

O'Sullivan et al [21] also found that muscle fatigue or shortening associated with low back dysfunction participant's effects on the function of muscle spindle and they cannot attain the correct neutral positioning of the lumbosacral spine. result in alterations in the normal muscle recruitment pattern resulting in the repositioning errors, may be due to back pain cause a coordination dysfunction during movement, with alteration in the normal agonist-antagonist activity, particularly, as there is strong evidence to suggest that disturbances in neuromuscular control and motor performance may result directly from a reaction to the presence of pain.

Ehab [22] suggested that proprioception is affected in subjects with back dysfunction and that the proprioceptive deficit might be an essential a part of the functional disability experienced by participants. The results of the study showed significant differences in the lumbar repositioning accuracy between the healthy and the low back dysfunction groups

Parkhurst &Burnett [23] found stretch or tension on mechanoreceptors could produce an increase in afferent signals, while impulses decrease with shortening. Accordingly, both increased and decreased muscle stretch may cause mechano-receptive dysfunction that lead to difference in the lumbar repositioning accuracy between the healthy and the back dysfunction , The difference in the lumbar repositioning accuracy between the healthy and the back dysfunction In addition, the traditional view that joint receptors play the major role in controlling proprioception has been challenged in favour of the suggestion that muscle receptors may play an essential, perhaps primary, role in improving the mobility and function.

Lee et al [24] reported a significant reduction in pain of participants with chronic low back pain after training the participants with a ball, a result consistent with the current study result, Kofotolis and Kellis [25] also reported the reduction of pain in participants with chronic low back pain after a PNF program consisting of static and dynamic PNF programs, a result which was also consistent with the current study result

In the same context, Silfies et al [26] concluded that impaired trunk position sense was not linked to LBP in athletes, and that the majority of back injuries are not correlated with disturbances in spinal and trunk proprioception. They added that reduction in trunk position sense is not a predisposing factor to injury in such of individual's category. Thus, it seems that conclusions in the present study cannot be generalized to other non-matched category of participants and factors such as age or fitness level must be taken into account.

Mork & Westgaard [27] reported that there is a potential connection between sitting, especially prolonged, slumped postures, and worsening of LBP. This might be due to muscle inactivity causing transmission of forces to passive spinal structures, leading to tension on soft tissues. Their results suggest that impairment in lumbar proprioception could be interfering this by increasing adoption and preservation of poor postures. Impaired lumbar proprioception in sitting position may promote a loss of a neutral spine, leading to a position of poor muscular mechanical advantage.

Finally, it was found that repositioning precisions alike in both LBP and healthy individuals [28]. Both the outcomes of current study and that of previous studies investigating reposition accuracy in low back pain subjects reported greater repositioning errors in such population. Only after satisfactory learning period, people with LBP were capable to duplicate diverse trunk positioning accurately similar to non LBP participants. There are some limitations in the current study that include a short treatment period and lack of long-term follows up for patients after treatment.

Conclusion

Within the limitations of this study, we can conclude that, adding lumbar repositioning feedback training and conventional proprioception exercises on Swiss ball increase the treatment effect and lead to an improvement in pain and joint position sense in in patients with chronic mechanical low back pain.

Adres do korespondencji / Corresponding author

Mai Hassan Ahmed Desouki

E-mail: mai.hassan.pt @o6u.edu.eg

doi.org/10.56984/8ZG1A6Np0

Piśmiennictwo/ References

1. Mostgi F Q R C, Dias J M, Pereira LM, Obara K, Mazuquin B F, Silva M F, Nogueira J F. Pilates versus general exercise effectiveness on pain and functionality in non-specific chronic low back pain subjects. Journal of bodywork and movement therapies, 2015, 19.4: 636-645.
2. Balagué F, Mannion AF, PelliséF, Cedraschi C. Non-specific low back pain. The lancet, (2012) 379(9814), 482-491.
3. MANI, Paramasivan; RAJASEKARAN, Balaji; HABIB, Hisham. Abdominal drawing in maneuver: effect on gait parameters and pain reduction in patients with chronic low back pain. International Journal of Physiotherapy, 2016, 3.4: 473-477.
4 CLAUW, Daniel J. Diagnosing and treating chronic musculoskeletal pain based on the underlying mechanism (s). Best Practice & Research Clinical Rheumatology, 2015, 29.1: 6-19.
5. RÖIJEZON, Ulrik; CLARK, Nicholas C.; TRELEAVEN, Julia. Proprioception in musculoskeletal rehabilitation. Part 1: Basic science and principles of assessment and clinical interventions. Manual therapy, 2015, 20.3: 368-377.
6. Brumagne S, Cordo, P, Lysens R, Verschueren S, Swinnen S. The role of paraspinal muscle spindles in lumbosacral position sense in individuals with and without low back pain. Spine, 2000, 25.8: 989-994.
7. Caffaro R R, França F.J R, BurkeTN, Magalhães MO, Ramos L A V, Marques A P. Postural control in individuals with and without non-specific chronic low back pain: a preliminary case–control study. European spine journal, 2014, 23.4: 807-813.
8. VAN DIEËN, Jaap H.; KOPPES, Lando LJ; TWISK, Jos WR. Postural sway parameters in seated balancing; their reliability and relationship with balancing performance. Gait & posture, 2010, 31.1: 42-46.
9. McCaskey M A, Schuster-Amf C., Wirth B, Suica Z, de Bruin E D. Effects of proprioceptive exercises on pain and function in chronic neck-and low back pain rehabilitation: a systematic literature review. BMC musculoskeletal disorders, 2014, 15.1: 1-17.
10. Luomajoki HA, Beltran M BB, Careddu S , Bauer C M. Effectiveness of movement control exercise on patients with non-specific low back pain and movement control impairment: a systematic review and meta-analysis. Musculoskeletal Science and Practice, 2018, 36: 1-11.
11. Chiarotto A, Maxwell LJ, Ostelo RW, Boers M, Tugwell P, Terwee CB. Measurement properties of visual analogue scale, numeric rating scale, and pain severity subscale of the brief pain inventory in patients with low back pain: a systematic review. The Journal of Pain, 2019, 20.3: 245-263.
12. Tong M H, Mousavi S.J, Kiers H, Ferreira P, Refshauge K, van Dieën J. Is there a relationship between lumbar proprioception and low back pain? A systematic review with meta-analysis. Archives of physical medicine and rehabilitation, 2017, 98.1: 120-136. e2.
13. Kara B, Genc A, Yildirim Y, Ilcin N. Use of tape measure in people with or without back pain in assessment of reposition error. Turkish Neurosurgery, 2011, 21.3: 290-295.
14. Gaur V, Gupta S, Arora M. Study to Compare the Effects of Balance Exercises on Swiss ball and Standing, on Lumbar Reposition Sense, in Asymptomatic Individuals. Physiotherapy and occupational therapy journal, (2012) 5(1), 5-10.
15. ROJHANI-SHIRAZI, Zahra; BARZINTAJ, Fatemeh; SALIMIFARD, Mohamad Reza. Comparison the effects of two types of therapeutic exercises Frenkele vs. Swiss ball on the clinical balance measures in patients with type II diabetic neuropathy. Diabetes & Metabolic Syndrome: Clinical Research & Reviews, 2017, 11: S29-S32.
16. Wand BM, Tulloch V M, George P J, Smith AJ, Goucke R, O'Connell N E, Moseley G L. Seeing it helps: movement-related back pain is reduced by visualization of the back during movement. The Clinical journal of pain, 2012, 28.7: 602-608.
17. Grunnesjö MI, Bogefeldt JP, Svärdsudd K F, Blomberg S I. A randomized controlled clinical trial of stay-active care versus manual therapy in addition to stay-active care: functional variables and pain. Journal of manipulative and physiological therapeutics, 2004, 27.7: 431-441.
18. Weerakkody N, Blouin J, Taylor J, Gandevia S. Local subcutaneous and muscle pain impairs detection of passive movements at the human thumb. The Journal of Physiology, 2008, 586.13: 3183-3193.
19. Radovanovic D, Peikert K, Lindström M, Domellöf F P. Sympathetic innervation of human muscle spindles. Journal of anatomy, 2015, 226.6: 542-548.
20. Rungthip P, Rungthip C, SuSu H, Weerasak T, Pongsatorn S, Rose Boucaut. The effect of core stabilization exercise on lumbar joint position sense in patients with subacute non-specific low back pain: a randomized controlled trial. Journal of physical therapy science, 2018, 30.11: 1390-1395.
21. O'Sullivan P B, Burnett A, Floyd A N, Gadsdon K, Logiudice J, Miller D, Quirke H. Lumbar repositioning deficit in a specific low back pain population. Spine, 2003, 28.10: 1074-1079.
22. Ehab E Georgy, Lumbar repositioning accuracy as a measure of proprioception in patients with back dysfunction and healthy controls. Asian spine journal, 2011, 5.4: 201.
23. PARKHURST, Thomas M.; BURNETT, Carolyn N. Injury and proprioception in the lower back. Journal of Orthopaedic & Sports Physical Therapy, 1994, 19.5: 282-295.
24. LEE, Eun-Young; BANG, Yoo-Soon; KO, Ja-Kyung. Effect of therapeutic gymnastic ball exercise in patients with chronic low back pain. Physical Therapy Korea, 2003, 10.3: 109-126.
25. KOFOTOLIS, Nick; KELLIS, Eleftherios. Effects of two 4-week proprioceptive neuromuscular facilitation programs on muscle endurance, flexibility, and functional performance in women with chronic low back pain. Physical therapy, 2006, 86.7: 1001-1012.
26. Silfies S P, Cholewicki J, Reeves, N P, Greene H S.. Lumbar position sense and the risk of low back injuries in college athletes: a prospective cohort study. BMC Musculoskeletal Disorders, 2007, 8.1: 1-7.
27. MORK, Paul Jarle; WESTGAARD, Rolf H. Back posture and low back muscle activity in female computer workers: a field study. Clinical biomechanics, 2009, 24.2: 169-175.
28. Newcomer K L, Laskowski E R, Yu, B, Johnson J.C., & An KN.. Differences in repositioning error among patients with low back pain compared with control subjects. Spine, 2000, 25.19: 2488-2493.

doi.org/10.56984/8ZG1A6Np0