LETTERATURA SCIENTIFICA

Randomized Controlled Trial

J Bodyw Mov Ther 2024 Apr:38:399-405. doi: 10.1016/j.jbmt.2023.10.006. Epub 2024 Jan 16.

Comparison of aquatic physiotherapy and therapeutic exercise in patients with chronic low back pain

Gabriela Peretro 1, Aline Luana Ballico 1, Núbia Carelli de Avelar 1, Daniela Pacheo Dos Santos Haupenthal 1, Livia Arcêncio 1, Alessandro Haupenthal 2

Affiliations expand

PMID: 38763585

DOI: 10.1016/j.jbmt.2023.10.006

Abstract

Objective: To investigate and compare the effectiveness of aquatic physiotherapy and therapeutic exercise in the physical and functional performance of patients with chronic low back pain.

Methods: Twenty-six participants were randomized into 3 groups, namely an aquatic physiotherapy group (AG), a therapeutic exercise group (EG), and a control group (CG). The pain, disability, and quality of life were compared before and after the exercise protocols for 2 months, twice a week, on alternate days, for 60 min. For statistical analyses, the Kruskal-Wallis test was used to test the difference between the groups; the Wilcoxon test and the effect size were used for before-and-after comparisons.

Results: Twenty participants completed the study. There was a significant difference improvement in pain between the AG and the EG ($p = 0.004$), between the EG and the CG ($p = 0.05$), and in social role functioning between the groups ($p = 0.02$). No differences were observed in the other analyzed variables between the groups. Compared to the pre-treatment state, there were significant improvements in the AG in terms of pain ($p = 0.02$), functionality ($p = 0.03$), and general health status ($p = 0.04$).

Conclusion: The AG group showed significant and clinical improvement in pain, disability, and quality of life. Improvements related to social aspects were found in the EG compared to the CG. The water provides a safe environment that facilitates the onset of exercise, so aquatic physiotherapy could be considered the first recommendation for patients with low back pain.

Keywords: Exercise therapy; Hydrotherapy; Low back pain; Rehabilitation.

Review

Musculoskelet Sci Pract 2024 Jun:71:102926. doi: 10.1016/j.msksp.2024.102926. Epub 2024 Mar 15.

Swimming for low back pain: A scoping review

Deborah M Wareham 1, Joel T Fuller 2, Tayla J Douglas 3, Christopher S Han 4, Mark J Hancock 5

Affiliations expand

PMID: 38522227

DOI: 10.1016/j.msksp.2024.102926

Free article

Abstract

Background: Guidelines recommend exercise for treatment of chronic low back pain and prevention, but the amount and quality of evidence for different exercise modes is highly variable. Swimming is commonly recommended by health professionals, but the extent and quality of research supporting its relationship with back pain is not clear.

Objectives: The aim of this scoping review was to map the extent, characteristics and findings of research investigating the relationship between swimming and low back pain.

Design: Scoping review.

Method: Four electronic databases (MEDLINE, EMBASE, CINAHL, and SPORT Discus) were searched from inception to February 2023. We included primary studies and reviews that reported an association between swimming and low back pain. Hydrotherapy studies were excluded.

Results: 3093 articles were identified, and 44 studies included. Only one randomised controlled trial and one longitudinal cohort study were included. Most studies were cross-sectional (37/44; 84.1%), included competitive athletes (23/39; 59.0%), and did not primarily focus on the association between swimming and low back pain in the aims (41/44; 93.2%). Instead, most data available were largely incidentally collected or a secondary outcome. The reported associations between swimming and low back pain were highly variable regardless of whether the comparison was to other sports (odds ratio: 0.17 to 17.92) or no sport (odds ratio: 0.54 to 3.01).

Conclusion: Most available literature investigating swimming and low back pain is cross-sectional in design. We did not identify any clear pattern of association between swimming and low back pain, based on the available literature.

Keywords: Aquatic exercise; Back pain; Prevention; Rehabilitation; Therapeutic exercise.

Review

J Bodyw Mov Ther 2023 Oct:36:274-281. doi: 10.1016/j.jbmt.2023.05.012. Epub 2023 Aug 25.

Recommending swimming to people with low back pain: A scoping review

Helen Oakes 1, Marlize de Vivo 2, Hayley Mills 3, David Stephensen 4

Affiliations expand

PMID: 37949572

DOI: 10.1016/j.jbmt.2023.05.012

Free article

Abstract

Background: It is common practice for health professionals to recommend swimming to people with low back pain (LBP) despite limited evidence. The aim of this review was to gain an understanding of the current evidence base supporting the recommendation of swimming to people with LBP.

Methods: A scoping review was conducted searching five electronic databases, CINAHL, MEDLINE, PEDro, PubMed, and SPORTdiscus using the keywords back pain AND swim*. The studies were grouped by study design and the following uncertainties were considered; the impact of swimming on the spine and LBP, evidence of swimming increasing or reducing the risk of LBP and the use of swimming in LBP rehabilitation programmes.

Results: 25 studies met the eligibility criteria; including sixteen observational studies exploring the relationship between swimming and LBP, three biomechanical studies investigating the impact of swimming on the spine, and five interventional studies of which four integrated swimming into a rehabilitation programme and one used swimming to modify lumbar lordosis.

Conclusion: The review confirmed there is limited research and only low-level evidence to support the recommendation of swimming to people with LBP. Observational studies make up the greater proportion of research undertaken in the field; the data indicates that swimming is a low-risk form of exercise but not without risk. The findings from biomechanical research suggest that lumbar lordosis does not increase excessively when swimming breaststroke, but certain swimming techniques could negatively impact LBP and interventional trials illustrate that there are various ways to integrate swimming into a rehabilitation programme.

Keywords: Low back pain; Swimming.

Clinical Trial

Curr Aging Sci 2023 Dec 18. doi: 10.2174/0118746098254991231125143735. Online ahead of print.

Perturbation-based Balance Training in Adults Aged above 55 years with Chronic Low Back Pain: A Comparison of Effects of Water versus Land Medium - A Preliminary Randomized Trial

Ramprasad Muthukrishnan 1, Fatima Mohammed Badr Ul Islam 1, Sukumar Shanmugam 1, Watson Arulsingh 1, Kumaraguruparan Gopal 1, Praveen Kumar Kandakurti 1, Sannasi Rajasekar 2, Gulshan Shahzadi Malik 3 4, Geovinson Sg 3

Affiliations expand

PMID: 38111118

DOI: 10.2174/0118746098254991231125143735

Abstract

Background: 'Rapid balance reaction' or 'perturbation' training is an emerging paradigm in elderly back pain rehabilitation due to its connection to postural stability.

Objective: This study aimed to inform the feasibility and practicality of perturbation-based balance training (PBT) using a stratification approach and to determine the effectiveness of land versus water-based PBT in elderly individuals with chronic low back pain (CLBP) Methods: Elderly CLBP participants (n=24) received exercise interventions as per treatmentbased classification (TBC) and were randomly allotted into water-based perturbation exercises (WBPE, Mean age=63.0±2.6years, n=12) and land-based perturbation exercise group (LBPE, 62.3±2.6 years, n=12). Pain intensity, disability, scores of fear-avoidance beliefs, fall efficacy, and rate of perceived exertion (RPE) were assessed before and at the end of 6 weeks.

Results: WBPE group reported a significant reduction in pain score (median difference(MD)):2, $p<0.03$), fear avoidance behaviour for work (MD:9, $p<0.01$) and fear avoidance behaviour for physical activity (MD:10, $p< 0.05$), improved straight leg raise right (SLR) (MD:37.5°, $p<0.05$), and improved modified fall efficacy scores (MFES, MD:25, $p<0.05$) compared to the LBPE group at post-intervention. Within-group analysis in both groups revealed significant improvement in clinical outcomes except for fear-avoidance beliefs related to physical activity in the LBPE group. Subgroup analysis revealed that the high BMI elderly CLBP group of LBPE had significant improvements similar to the WBPE group except for scores of FABQ physical activity scores and SLR.

Conclusion: Possible key factors for future research are discussed in the realms of perturbation exercise in the elderly with CLBP.

Keywords: Aquatic exercise therapy; chronic pain; hydrotherapy; low back pain; perturbation-based exercises; word.

BMC Musculoskelet Disord 2023 Dec 18;24(1):977. doi: 10.1186/s12891-023-07034-0.

Effect of aquatic exercise versus standard care on paraspinal and gluteal muscles morphology in individuals with chronic low back pain: a randomized controlled trial protocol

Brent Rosenstein 1, Chanelle Montpetit 1, Nicolas Vaillancourt 1, Geoffrey Dover 1 2, Najmeh Khalini-Mahani 3, Christina Weiss 2, Lee Ann Papula 2, Antonys Melek 2, Maryse Fortin 4 5 6

Affiliations expand

PMID: 38110922

PMCID: PMC10726523

DOI: 10.1186/s12891-023-07034-0

Abstract

Background: Low back pain (LBP) is one of the most disabling diseases and a major health issue. Despite the evidence of a link between paraspinal and gluteal muscle dysfunction and LBP, it is unknown whether aquatic exercises can lead to improvements in paraspinal and gluteal muscle morphology and function, and whether improvements in overall muscle health are associated with improvements in patients' outcomes. The unique properties of water allow a water-based exercise program to be tailored to the needs of those suffering from LBP. This study uses magnetic resonance imaging (MRI) to investigate the effect of an aquatic exercise program versus standard exercise on 1) paraspinal and gluteal muscle size, quality and strength and 2) pain, disability, and psychological factors (pain related fear, depression, anxiety, sleep quality) in chronic LBP.

Methods: This study will include 34 participants with chronic non-specific LBP and moderate to severe disability, aged between 18 and 65, who will be randomly assigned (1:1) to the aquatic exercise group or land-based standard care exercise group. Both groups will receive 20 supervised sessions, twice per week over 10 weeks. MRIs will be obtained along the lumbosacral spine (L1-L5) and pelvis at the start and end of the intervention to assess the effect of each exercise intervention on paraspinal and gluteal muscle size and quality. Pre- to post-intervention changes in all outcomes between each group will be assessed, and the association between the changes in back muscle quality and clinical outcomes will be examined. Between-subjects repeated measure analysis of variance will be used to examine the changes in paraspinal muscle morphology over the different time points. Linear mixed models will be used to assess whether baseline scores can modify the response to the exercise therapy treatment.

Discussion: This study will determine if water-based exercises targeting the lower back and gluteal muscles can lead to important changes in muscle quality and function, and their possible relation with patients' pain and functional improvements. Our findings will have strong clinical implications and provide preliminary data to design a community program to better support individuals with chronic LBP.

Trial registration: NCT05823857, registered prospectively on April 27th, 2023.

Keywords: Aquatic therapy; Function; Gluteal muscle; MRI; Non-specific low back pain; Paraspinal muscle; Quality of life.

Randomized Controlled Trial

Sci Rep 2023 Jul 3;13(1):10716. doi: 10.1038/s41598-023-37237-3.

Effects of early aquatic exercise intervention on trunk strength and functional recovery of patients with lumbar fusion: a randomized controlled trial

An-Hua Huang # 1 2, Wen-Hsiang Chou # 3, Wendy Tzyy-Jiuan Wang 1, Wen-Yin Chen 4, Yi-Fen Shih 5

Affiliations expand

PMID: 37400496

PMCID: PMC10317955

DOI: 10.1038/s41598-023-37237-3

Abstract

This study investigated the effectiveness of an early aquatic exercise program on trunk muscle function and functional recovery of patients with lumbar fusion. Twenty-eight subjects were divided into two equal groups. Patients in the aquatic group performed two 60-min aquatic exercise sessions and three 60-min home exercise sessions per week for 6 weeks, whereas those in the control group performed five sessions of 60-min home exercises per week for 6 weeks. The primary outcomes were the Numerical Pain Rating Scale (NPRS) and Oswestry Disability Index (ODI), and the secondary outcomes were Timed Up and Go Test (TUGT), trunk flexor and extensor muscle strength, lumbopelvic stability, and lumbar multifidus muscle thickness measured pre- and post-intervention. Compared with participants in the control group, those in the experimental group showed significant improvement in NPRS, ODI, trunk extensor strength, lumbopelvic control, lumbar multifidus muscle thickness, and relative change in multifidus muscle thickness (significant time by group interactions, $P < 0.05$). Participants in both groups showed significant time effects ($P < 0.001$) for TUGT and trunk flexor strength outcome. Aquatic exercise combined with home exercise was superior to home exercise alone in reducing pain, disability and improving muscle strength, lumbopelvic stability, and lumbar multifidus muscle thickness

Meta-Analysis

Biol Res Nurs 2023 Oct;25(4):527-541. doi: 10.1177/10998004231162327. Epub 2023 Mar 6.

Aquatic Exercise Impact on Pain Intensity, Disability and Quality of Life in Adults with Low Back Pain: A Systematic Review and Meta-analysis

Fatemeh Heidari 1, Nasser Mohammad Rahimi 2, Reza Aminzadeh 1

Affiliations expand

PMID: 36878886
DOI: 10.1177/10998004231162327

Abstract

Background: Low back pain is a common, multifaceted disorder that directly affects diverse aspects of people's lives in terms of health, personal and social lives. A variety of pathological disorders, including low back pain, may benefit from hydrotherapy.

Objective: This study aimed to systematically analyze the efficacy of aquatic exercise on pain intensity, disability, and quality of life among adults with low back pain.

Data sources: A systematic search was conducted in PubMed, Web of Science, Medline, and Scopus up to February 2023 for randomized controlled trials (RCTs) that which examined the impact of aquatic exercise. The most relevant articles were selected based on research criteria. The PEDro scale was applied to assess the quality of the included studies. Review Manager 5.3 was used for conducting all analyses.

Study selection: Out of 856 articles, 14 RCTs (n = 484 participants; 257 in the experimental groups and 227 in the control groups) met our inclusion criteria.

Results: Pooled results illustrated that aquatic exercises significantly reduced pain (mean differences (MD): -3.82; p < 0.00,001), improved disability (standardized mean differences (SMD): 1.65; p < 0.00,001), and improved quality of life in both the physical component score (mean difference (MD), 10.13; p < 0.00,001) and the mental component score (MD, 6.45; p < 0.0001) when compared with a control group.

Conclusion: The current review showed that aquatic exercise regimens were effective among adults with low back pain. High-quality clinical investigations are still needed to support the use of therapeutic aquatic exercise in a clinical setting.

Keywords: hydrotherapy; low back pain; meta-analysis; pain.

Physiotherapy 2022 Sep:116:108-118. doi: 10.1016/j.physio.2022.03.003. Epub 2022 Mar 23.

The WATER study: Which AquaTic ExeRcises increase muscle activity and limit pain for people with low back pain?

Stelios G Psycharakis 1, Simon G S Coleman 2, Linda Linton 3, Stephanie Valentin 4

Affiliations expand

PMID: 35709587

DOI: 10.1016/j.physio.2022.03.003

Free article

Abstract

Objective: Aquatic exercise therapy is used for the treatment and management of chronic low back pain (CLBP). However, to the authors' knowledge, no studies to date have compared muscle activity between different aquatic exercises performed by people with CLBP. As such, this study assessed and compared muscle activity, pain, perceived exertion and exercise intensity between different rehabilitative aquatic exercises.

Design: Cross-sectional.

Setting: A 25-m indoor swimming pool within a university building.

Participants: Twenty participants with non-specific CLBP.

Assessment: Twenty-six aquatic exercises in shallow water (1.25-m depth). Muscle activity was quantified bilaterally for the erector spinae, multifidus, gluteus maximus and medius, rectus abdominis, and external and internal obliques.

Main outcomes: Mean and peak muscle activity, pain (visual analogue scale), perceived exertion (Borg scale) and exercise intensity (heart rate).

Results: Hip abduction/adduction and extension/flexion exercises produced higher activity for gluteal muscles. Variations of squat exercises increased the activity of back extensors. Higher abdominal muscle activity was produced with exercises that made use of buoyancy equipment and included leg and trunk movements while floating on the back, and with some proprioceptive and dynamic lower limb exercises. Pain occurrence and intensity were very low, with 17 exercises being pain free.

Conclusions: This study provides evidence on trunk and gluteal muscle activity, pain, intensity and perceived exertion for people with CLBP performing aquatic exercises. The findings may be useful when prescribing exercises for rehabilitation, as physiotherapists seek to implement progression in effort and muscle activity, variation in exercise type, and may wish to target or avoid particular muscles. CONTRIBUTION OF THE PAPER.

Keywords: Biomechanics; Hydrotherapy; Musculoskeletal; Physiotherapy; Rehabilitation.

Randomized Controlled Trial

Lasers Med Sci 2022 Jun;37(4):2135-2144. doi: 10.1007/s10103-021-03443-6. Epub 2022 Mar 4.

Effects of photobiomodulation and deep water running in patients with chronic non-specific low back pain: a randomized controlled trial

Daniele Mayumi Kurata Nardin 1, Marieli Ramos Stocco 2, Andreo Fernando Aguiar 1, Fabiana Andrade Machado 3, Raphael Gonçalves de Oliveira 1, Rodrigo Antonio Carvalho Andraus 1

Affiliations expand

PMID: 35246766
DOI: 10.1007/s10103-021-03443-6

Abstract

Photobiomodulation therapy (PBM) is often used to treat musculoskeletal disorders such as chronic non-specific low back pain (NSCLBP) as it can have positive effects on biomarkers-creatine kinase (CK) and serum cortisol levels-related to stress caused by physical exercise, such as deep water running (DWR) or by pain. The aim of this study was to evaluate the effects of the combination of PBM and aquatic exercise (DWR) on the intensity of pain, disability, 6-min walk test adapted (6WTA), and on cortisol and creatine kinase (CK) levels in a population with NSCLBP. The participants were allocated into three groups: TGPBM (Photobiomodulation and Training Group), TGPLA (Placebo Photobiomodulation and Training Group), and the GPBM (Photobiomodulation Group). Information regarding anthropometric data, blood pressure, and heart rate were collected, and the questionnaires were applied: IPAQ-Short Form, Oswestry Disability Index, and the Visual Analog Scale for Pain. The submaximal exercise test (6WTA) was performed. Blood was collected for analysis of cortisol and CK levels. The training sessions were performed twice a week, for 4 weeks. In the intragroup comparisons, there were statistically significant changes in the TGPBM and GPBM groups in the outcomes pain intensity, disability (reductions in both groups), and in cortisol (increased in the TGPBM and reduced in the GPBM); in the TGPLA group, there was a statistically significant reduction only in the outcome of pain intensity. In the intergroup comparison, in the comparison between TGPBM and TGPLA, there was a statistically significant difference in the level of cortisol, as well as in the comparison between TGPBM and GPBM, in which there was a statistically significant difference for this same outcome (cortisol) and for the 6WTA outcome. The effects of the combination of PBM and aquatic exercise have positive effects on reducing pain intensity, disability, and cortisol levels, but its effects on other variables (6WTA and CK) are too small to be considered significant. Trial registration number: NCT03465228-April 3, 2019; retrospectively registered (ClinicalTrials.gov).

Keywords: Exercise therapy; Laser therapy; Low back pain; Phototherapy.

Randomized Controlled Trial

JAMA Netw Open 2022 Jan 4;5(1):e2142069. doi: 10.1001/jamanetworkopen.2021.42069.

Efficacy of Therapeutic Aquatic Exercise vs Physical Therapy Modalities for Patients With Chronic Low Back Pain: A Randomized Clinical Trial

Meng-Si Peng 1 2, Rui Wang 1, Yi-Zu Wang 1, Chang-Cheng Chen 3, Juan Wang 4, Xiao-Chen Liu 1, Ge Song 1, Jia-Bao Guo 5, Pei-Jie Chen 1 6, Xue-Qiang Wang 1 6

Affiliations expand

PMID: 34994794
PMCID: PMC8742191
DOI: 10.1001/jamanetworkopen.2021.42069

Abstract

Importance: Therapeutic aquatic exercise is frequently offered to patients with chronic low back pain, but its long-term benefits are unclear.

Objective: To assess the long-term effects of therapeutic aquatic exercise on people with chronic low back pain.

Design, setting, and participants: This 3-month, single-blind randomized clinical trial with a 12-month follow-up period was performed from September 10, 2018, to March 12, 2019, and the trial follow-up was completed March 17, 2020. A total of 113 people with chronic low back pain were included in the experiment.

Interventions: Participants were randomized to either the therapeutic aquatic exercise or the physical therapy modalities group. The therapeutic aquatic exercise group received aquatic exercise, whereas the physical therapy modalities group received transcutaneous electrical nerve stimulation and infrared ray thermal therapy. Both interventions were performed for 60 minutes twice a week for 3 months.

Main outcomes and measures: The primary outcome was disability level, which was measured using the Roland-Morris Disability Questionnaire; scores range from 0 to 24, with higher scores indicating more severe disability. Secondary outcomes included pain intensity, quality of life, sleep quality, recommendation of intervention, and minimal clinically important difference. Intention-to-treat and per-protocol analyses were performed.

Results: Of the 113 participants, 59 were women (52.2%) (mean [SD] age, 31.0 [11.5] years). Participants were randomly allocated into the therapeutic aquatic exercise group (n = 56) or the physical therapy modalities group (n = 57), and 98 patients (86.7%) completed the 12-month follow-up. Compared with the physical therapy modalities group, the therapeutic aquatic exercise group showed greater alleviation of disability, with adjusted mean group differences of -1.77 (95% CI, -3.02 to -0.51; P = .006) after the 3-

month intervention, -2.42 (95% CI, -4.13 to -0.70; P = .006) at the 6-month follow-up, and -3.61 (95% CI, -5.63 to -1.58; P = .001) at the 12-month follow-up (P < .001 for overall group × time interaction). At the 12-month follow-up point, improvements were significantly greater in the therapeutic aquatic exercise group vs the physical therapy modalities group in the number of participants who met the minimal clinically important difference in pain (at least a 2-point improvement on the numeric rating scale) (most severe pain, 30 [53.57%] vs 12 [21.05%]; average pain, 14 [25%] vs 11 [19.30%]; and current pain, 22 [39.29%] vs 10 [17.54%]) and disability (at least a 5-point improvement on the Roland-Morris Disability Questionnaire) (26 [46.43%] vs 4 [7.02%]). One of the 56 participants (1.8%) in the therapeutic aquatic exercise group vs 2 of the 57 participants (3.5%) in the physical therapy modalities group experienced low back pain and other pains related to the intervention.

Conclusions and relevance: The therapeutic aquatic exercise program led to greater alleviation in patients with chronic low back pain than physical therapy modalities and had a long-term effect up to 12 months. This finding may prompt clinicians to recommend therapeutic aquatic exercise to patients with chronic low back pain as part of treatment to improve their health through active exercise rather than relying on passive relaxation.

Int J Biometeorol 2021 Dec;65(12):2137-2145. doi: 10.1007/s00484-021-02176-z. Epub 2021 Aug 16.

The effectiveness of balneotherapy and thermal aquatic exercise in postoperative persistent lumbar pain syndrome

Elif Yolgösteren 1, Sevinç Külekçioğlu 2

Affiliations expand

PMID: 34398312
DOI: 10.1007/s00484-021-02176-z

Abstract

In our study, we aimed to investigate the effectiveness of balneotherapy and aquatic exercises in patients with postoperative chronic low back pain. Forty-three patients over the age of 18 who had been operated on for herniated disc and who had at least 6 months of back and/or leg pain were included in the study. The patients have been distributed randomly into 2 groups prior to the treatment. The program comprising aquatic exercises distributed into 5 days a week for 2 weeks and 20 min (min) a day, in a 33 °C spa pool was applied to the first group. After the first group's treatment was completed, a program consisting of walking out of the pool and strengthening and stretching exercises for the hip, abdominal, back, and waist muscles was distributed into 5 days a week for 2 weeks for a total duration of 20 min per day was applied to both groups. The patients subjected to the study were evaluated before treatment, after treatment (2nd week), and at 1st and 6th months after treatment. The Visual Analogue Scale, Modified Schober Test, Finger-to-Floor Distance, Sorensen Test, Progressive Iso-inertial Lifting Evaluation, Rolland Morris Disability Index, Leeds Disability Scale, Beck Depression Inventory, Nottingham Health Profile, and Short Form 36 Health Survey parameters were evaluated. We detected a significant improvement in all parameters except for the Sorensen test, in both groups. We observed that the changes in VAS, Sorensen, NHP, and SF 36 tests in the aquatic exercise group were significantly better than those in the non-aquatic exercise group.

Keywords: Back pain; Failed back surgery syndrome; Hydrotherapy; Physical therapy; Post lumbar surgery syndrome; Postlaminectomy syndrome.

Randomized Controlled Trial

J Sports Med Phys Fitness 2021 May;61(5):699-706. doi: 10.23736/S0022-4707.20.11265-9. Epub 2020 Dec 14.

Comparing the effects of aquatic exercises with or without high intensity on the functional status, muscular endurance, and performance of patients with chronic low back pain

Mabel M Olkoski 1, Mariana F Silva 2, Leandro C Guenka 2, Alexandre R Pelegrinelli 3, Laís F Dela Bela 4, Josilainne M Dias 5, Jéssyca F Nogueira 6, Gabriele O Pereira 2, Daniella C Souza 2, Rodrigo G Carvalho 7, Ligia M Facci 8, Jefferson R Cardoso 9

Affiliations expand

PMID: 33314877
DOI: 10.23736/S0022-4707.20.11265-9

Abstract

Background: The prevalence of low back pain is lower when physical fitness (aerobic and muscular) is higher. Strength exercises are important for subjects with low back pain, but there are few studies on the inclusion of aerobic exercise in low back pain programs. The aim of this study was to compare the effects of aquatic exercises with or without high-intensity component on the functional status, lumbar and abdominal muscle endurance, and performance of subjects with chronic low back pain.

Methods: Forty-eight volunteers between 20 and 60 years old were randomly allocated to an experimental group AEDWR (aquatic exercises plus deep-water running group, N.=25) or to a control group AE (aquatic exercises only group, N.=23). The dependent variables included functional status (Repeated Sit-to-Stand test), lumbar (Sorensen test) and abdominal (One Minute Abdominal test) muscle endurance, and physical performance (Maximum Physical Fitness test), which were measured before and after the 9-week intervention and at 21 weeks of follow-up.

Results: Lumbar endurance was higher in the AEDWR group at the end of the treatment, with a mean difference (MD) of 43.2 seconds, 95% confidence intervals (CI) (9.6; 76.7), P=0.01, $\overline{d}$=0.74, and better in the follow-up with MD=40.2 seconds, 95% CI (7.1; 73.3), P=0.02, $\overline{d}$=0.71, than in the AE group. Participant performance also improved on the 9th week in the AEDWR group, with an MD=0.53 kgf, 95% CI (0.008; 0.98), P=0.02, $\overline{d}$=0.60.

Conclusions: The addition of deep-water running exercise to aquatic exercises improved lumbar muscle endurance and performance when compared with aquatic exercises only, and this effect was maintained during the follow-up to lumbar muscle endurance.

Randomized Controlled Trial

Musculoskelet Sci Pract 2020 Oct:49:102195. doi: 10.1016/j.msksp.2020.102195. Epub 2020 May 27.

Effectiveness of additional deep-water running for disability, lumbar pain intensity, and functional capacity in patients with chronic low back pain: A randomised controlled trial with 3-month follow-up

Rodrigo G S Carvalho 1, Mariana F Silva 2, Josilainne M Dias 3, Mabel M Olkoski 4, Laís F Dela Bela 5, Alexandre R M Pelegrinelli 6, Maria S T Barreto 7, Renata R Campos 8, Leandro C Guenka 9, Ligia M Facci 10, Jefferson R Cardoso 11

Affiliations expand

PMID: 32861359
DOI: 10.1016/j.msksp.2020.102195

Abstract

Background: Aquatic exercise (AQE) programme is commonly used as an alternative to the chronic low back pain (CLBP) treatment. The addition of aquatic aerobic exercises to AQE may be beneficial to patients with CLBP.

Design: Randomised controlled trial.

Objectives: To assess the effectiveness of AQE with the addition of aerobic exercise - deep-water running (DWR) - compared to exclusive AQE in improving disability, lumbar pain intensity, and functional capacity in patients with CLBP.

Methods: Fifty-four adult patients with CLBP were randomised either to the experimental group (AQE + DWR) or the control group (AQE). An assessor who was blinded to the group allocation performed both pre- and post-interventions assessments. Both treatments lasted 9 weeks, with a 3-month follow-up. The primary outcome was disability, as evaluated using the Roland Morris Disability Questionnaire. The secondary outcomes were pain and functional capacity; pain was assessed using a visual analogue scale (VAS), and functional capacity (travelled distance) was measured using the 6-min walk test (6WT).

Results: A significant difference in pain was observed between groups after intervention in favour of DWR (mean difference -1.3 cm [95% confidence interval (CI) -2.17 to -0.45], $d^- = 0.80$ [95% CI 0.22 to 1.33]).

Conclusion: Treatment with DWR was effective in the short term for achieving the desired outcome of pain reduction when compared with AQE only but not for disability and functional capacity.

Keywords: Chronic low back pain; Disability; Exercise; Hydrotherapy; Pain.

Case Reports

Int Med Case Rep J 2020 May 15:13:171-176. doi: 10.2147/IMCRJ.S247697. eCollection 2020.

Ozone Therapy and Aquatic Rehabilitation Exercises to Overcome the Lumbar Pain Caused by Facet Joint Syndrome - Case Report

Rosa Grazia Bellomo # 1, Teresa Paolucci # 2, Niki Giannandrea 2, Letizia Pezzi 2, Raoul Saggini 2

Affiliations expand

PMID: 32523385
PMCID: PMC7237124
DOI: 10.2147/IMCRJ.S247697

Abstract

Purpose: Facet joint syndrome (FJS) is an arthritis-like condition of the spine that can be a significant source of low back pain (LBP). Ozone therapy (OT) could be an additional treatment method. We evaluated the therapeutic results of percutaneous injection of ozone to ablate acute LBP caused by FJS.

Methods: A 73-year-old Caucasian woman was treated by OT: one ozone injection (20 µg/mL) per week for 3 weeks under ultrasound guidance. After a break of 1 week, she performed exercises for aquatic rehabilitation (twice a week for 4 weeks).

Results: The outcome measure was pain relief for ≥6 months according to the Numeric Rating Scale (NRS), Oswestry Disability Index (ODI), and Brief Pain Inventory (BPI) test. From baseline to 1 month after OT, a reduction in pain was documented and the result was maintained at 6-month follow-up.

Conclusion: OT followed by aquatic exercises could be efficacious against the LBP caused by FJS.

Keywords: Oswestry Disability Index; injection; low back pain; ozone; spine.

J Sport Rehabil 2020 Feb 21;30(1):37-42. doi: 10.1123/jsr.2019-0185.

A Comparison of 6 Weeks of Aquatic Exercise and Kinesio Taping in Patients With Chronic Nonspecific Low Back Pain

Yaser Alikhajeh, Elyas Barabadi, Gholam Rasul Mohammad Rahimi

PMID: 32087600
DOI: 10.1123/jsr.2019-0185

Abstract

Context: In many societies, although chronic low back pain (LBP) is a significant problem, there is no consensus on the optimal therapeutic intervention.

Objective: To compare the impact of aquatic exercise (AE) and kinesio taping (KT) on the pain intensity and functional incapacity in women with chronic nonspecific LBP.

Design: Randomized controlled trial.

Setting: Outpatient clinic.

Participants: Thirty-six women with chronic nonspecific LBP (mean [SD]: age = 50.69 [4.187] y) participated.

Interventions: Participants randomly assigned to AE (n = 12), KT (n = 12), and nontreatment control (n = 12) groups for 6 weeks.

Main outcome measures: Pain intensity and functional disability were evaluated at baseline and the end of the intervention.

Results: Pain intensity decreased more in the AE group than in the KT group (5.9-0.5 cm [91.6% decrease] vs 5.7-2.4 cm [58.1% decrease], respectively; P < .001 for both after Bonferroni post hoc test); the values decreased more in the 2 treatment groups than in the control group (P < .001 for between-group comparisons). Disability decreased more in the AE group (43.2%-18.8% [55.6% decrease]) than the KT group (37.8%-19.3% [48.3% decrease]) (P < .001 for both comparisons), but increased in the control group (38.7%-41.2% [6.5% increase]; P = .045).

Conclusion: These results suggest AE and KT treatment methods provide pain intensity and disability improvements in women with chronic nonspecific LBP. Nevertheless, AE was more effective than KT.

Keywords: aquatic therapy; functional disability; kinesio tape; randomized controlled trial.

J Exerc Rehabil 2019 Dec 31;15(6):855-860. doi: 10.12965/jer.1938688.344. eCollection 2019 Dec.

The effect of aquatic exercise program on low-back pain disability in obese women

Fariba Hossein Abadi 1, Mohansundar Sankaravel 1, Fairus Fariza Zainuddin 1, Gunathevan Elumalai 1, Azira Iqlima Razli 1

Affiliations expand

PMID: 31938709
PMCID: PMC6944883
DOI: 10.12965/jer.1938688.344

Abstract

Low-back pain (LBP) is one of the most current causes to reduce work performance, limit daily activities and raising health cost, and it is in-creasing as obesity growing as a public health concern. While obese LBP people cannot avoid weight load on the spine in any exercise, they can easily carry out exercise in water. This study aimed to investigate the effect of aquatic exercise on LBP disability among obese women. In this study, a total of 39 women with body mass index (BMI)≥27 kg/m2 who suffering from nonspecific chronic LBP were purposively selected. They randomly assigned in two groups; aquatic and control. The aquatic group carried out aquatic exercise, twice per week, 60 min per session, for 12 weeks. LBP disability was measured using modified Oswestry questionnaire with ten sections; pain intensity, personal care, lifting, walking, sitting, standing, sleeping, social life, traveling, and employment. Results showed no significant difference in age, weight, BMI, waist to hip ratio, and percentage of body fat in both groups. An analyzing of multivariate analysis of covariance revealed that there was significant improvement on pain intensity, personal care, sitting, standing, sleeping, employment and total disability score in aquatic group, while there was no significant difference in lifting, walking, social life, and traveling abilities after 12 weeks between the groups. As a conclusion, this progressive aquatic exercise was a convenience and effective intervention program to reduce pain intensity, and improve personal care, sitting, standing, sleeping, and employment abilities in obese LBP women.

Keywords: Aquatic exercise; Disability; Low-back pain; Obese women.

Randomized Controlled Trial

Clin Rehabil 2015 Jun;29(6):538-47. doi: 10.1177/0269215514549033. Epub 2014 Sep 8.

Aquatic exercise and pain neurophysiology education versus aquatic exercise alone for patients with chronic low back pain: a randomized controlled trial

Diogo Pires 1, Eduardo Brazete Cruz 2, Carmen Caeiro 2

Affiliations expand

PMID: 25200879
DOI: 10.1177/0269215514549033

Abstract

Objective: The aim of this study was to compare the effectiveness of a combination of aquatic exercise and pain neurophysiology education with aquatic exercise alone in chronic low back pain patients.

Design: Single-blind randomized controlled trial.

Setting: Outpatient clinic.

Subjects: Sixty-two chronic low back pain patients were randomly allocated to receive aquatic exercise and pain neurophysiology education (n = 30) or aquatic exercise alone (n = 32).

Interventions: Twelve sessions of a 6-week aquatic exercise programme preceded by 2 sessions of pain neurophysiology education. Controls received only 12 sessions of the 6-week aquatic exercise programme.

Main measures: The primary outcomes were pain intensity (Visual Analogue Scale) and functional disability (Quebec Back Pain Disability Scale) at the baseline, 6 weeks after the beginning of the aquatic exercise programme and at the 3 months follow-up. Secondary outcome was kinesiophobia (Tampa Scale of Kinesiophobia).

Results: Fifty-five participants completed the study. Analysis using mixed-model ANOVA revealed a significant treatment condition interaction on pain intensity at the 3 months follow-up, favoring the education group (mean SD change: -25.4± 26.7 vs -6.6 ± 30.7, P < 0.005). Although participants in the education group were more likely to report perceived functional benefits from treatment at 3 months follow-up (RR=1.63, 95%CI: 1.01-2.63), no significant differences were found in functional disability and kinesiophobia between groups at any time.

Conclusions: This study's findings support the provision of pain neurophysiology education as a clinically effective addition to aquatic exercise.

Keywords: Education; chronic low back pain; disability; exercise; pain.

Randomized Controlled Trial

Disabil Rehabil 2015;37(4):311-8. doi: 10.3109/09638288.2014.918191. Epub 2014 May 12.

The optimal frequency of aquatic physiotherapy for individuals with chronic musculoskeletal pain: a randomised controlled trial

Antonio I Cuesta-Vargas 1, Melanie White, Manuel González-Sánchez, Raija Kuisma

Affiliations expand

PMID: 24819432
DOI: 10.3109/09638288.2014.918191

Abstract

Purpose: To establish whether there was a difference in health-related quality of life (HRQoL) in people with chronic musculoskeletal disorders (PwCMSKD) after participating in a multimodal physiotherapy program (MPP) either two or three sessions a week.

Methods: Total of 114 PwCMSKD participated in this prospective randomised controlled trial. An individualised MPP, consisting of exercises for mobility, motor-control, muscle strengthening, cardiovascular training, and health education, was implemented either twice a week (G2: n = 58) or three times a week) (G3: n = 56) for 1 year.

Outcomes: HRQoL physical and mental health state (PHS/MHS), Roland Morris disability Questionnaire (RMQ), Neck-Disability-Index (NDI) and Western Ontario and McMaster Universities' Arthritis Index (WOMAC) were used to measure outcomes of MPP for people with chronic low back pain, chronic neck pain and osteoarthritis, respectively. Measures were taken at baseline, 8 weeks (8 w), 6 months (6 m), and 1 year (1 y) after starting the programme.

Results: No statistically significant differences were found between the two groups (G2 and G3), except in NDI at 8 w (-3.34, (CI 95%: -6.94/0.84, p = 0.025 (scale 0-50)). All variables showed improvement reaching the following values (from baseline to 1 y) G2: PHS: 57.72 (baseline: 41.17; (improvement: 16.55%), MHS: 74.51 (baseline: 47.46, 27.05%), HRQoL 0.90 (baseline: 0.72, 18%)), HRQoL-VAS 84.29 (baseline: 58.04, 26.25%), RMQ 4.15 (baseline: 7.85, 15.42%), NDI 3.96 (baseline: 21.87, 35.82%), WOMAC 7.17 (baseline: 25.51, 19.10%). G3: PHS: 58.64 (baseline: 39.75, 18.89%), MHS: 75.50 (baseline: 45.45, (30.05%), HRQoL 0.67 (baseline: 0.88, 21%), HRQoL-VAS 86.91 (baseline: 52.64, 34.27%), RMQ 4.83 (baseline: 8.93, 17.08%), NDI 4.91 (baseline: 23.82, 37.82%), WOMAC 6.35 (baseline: 15.30, 9.32%).

Conclusions: No significant differences between the two groups were found in the outcomes of a MPP except in the NDI at 8 weeks, but both groups improved in all variables during the course of 1 year under study. Implications for Rehabilitation A multimodal physiotherapy program (MPP) improves quality of life, overall health, and function in people with chronic musculoskeletal disease after an intervention of short,

medium and long term. This implies that twice a week MPP for people with chronic musculoskeletal pain has comparable results to three times a week provision and therefore may have implications in saving resources and cost for patients and service providers without compromising the outcomes of treatment. These results can be considered not only for therapists, but also for managers who offer the services to optimise the balance cost-effectiveness of the proposed interventions.

Keywords: Chronic musculoskeletal disorders; exercise dose; frequency; health-related quality of life; physiotherapy.