



Effects of Aquatic Exercise Programme and Massage on Pain Intensity and Muscle Elastic Properties in Chronic Nonspecific Low Back Pain: A Pilot Study

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Background and Aim. Patients experiencing low back pain (LBP) often develop chronic, mostly nonspecific LBP. Studies show that, compared to healthy individuals, these patients exhibit increased stiffness of the erector spinae muscle (ESM). For the treatment of chronic LBP, aquatic exercise programmes (AEP) are applied, which are characterised by a lower risk of injury and easier performance of exercises. It has been established that classical massage (CM) can reduce pain intensity in patients experiencing chronic LBP. This study aimed to evaluate the effects of AEP and CM on pain intensity and muscle elastic properties in chronic nonspecific LBP.

Methods. Participants were divided into two groups: experimental group (EG) and control group (CG). The EG received AEP and CM. No intervention was applied to the CG. Pain intensity at rest, during movement, and during sleep was assessed using a Visual Analogue Scale. ESM elastic properties were measured using myotonometry.

Results. No differences of the EG and CG at the baseline were observed ($p > 0.05$). Pain intensity at rest, during movement, and during sleep, ESM stiffness and tone decreased in the EG ($p < 0.05$) and differed from CG ($p < 0.05$). ESM elasticity in the EG increased ($p < 0.05$). No significant changes of the variables of CG were observed ($p > 0.05$).

Conclusions. The application of CM and AEP reduced pain intensity at rest, during movement, and during sleep. The application of AEP and CM decreased ESM tone and stiffness and increased ESM elasticity. Future studies should conduct controlled trials comparing the effectiveness of AEP and CM with other physiotherapy methods.

Keywords: Aquatic exercise; classical massage; chronic nonspecific low back pain; myotonometry

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Informed Consent Statement: This study was approved by the Ethics Committee of Lithuanian Sports University (No. MI-KIN (M)-2025-793, dated 18 06 2025). All participants provided written informed consent prior to participation. The study was conducted in accordance with the Declaration of Helsinki.

