Investigating the effects of a spinal mobilisation intervention in people with lower back pain.

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Study Protocol

Participants

40 participants were recruited for this study via posters, social media and word of mouth. If interest in the study was shown, an information sheet with inclusion and exclusion criteria was given to the participant. If inclusion and exclusion criteria were met, the participant was randomly sorted into a group by a random group generator and testing sessions for the intervention and control were arranged.

Procedure

Participants were involved in both a control and a spinal mobilisation intervention session. All participants were informed about details of the study and provided written consent to take part. All data collection took place in the same treatment room at the Edinburgh Napier Sighthill campus, on the same standard physiotherapy plinth. Both sessions were arranged as close to the same time of day as possible to avoid additional environmental influences. Ambient room temperature was controlled (between 20° and 23° Celsius) for all sessions. All participants completed the Oswestry Disability Index (ODI) questionnaire and an ODI scoring sheet prior to their first session to categorise their level of lower back pain. Anthropometric measures for height, mass, waist circumference and gender were also taken.

Outcome measures for muscle stiffness, tone and elasticity were taken immediately before and after both sessions. The pre intervention stiffness measure determined which side the therapy was applied to. This was based on the greatest mean value for stiffness following 3 recorded measures, therefore working on the stiffer side of the spine. The location for measurements was identified on both sides of the spine on erector spinae (longissimus). Measurements were taken from the central belly of this muscle by asking the participant to lift their head and feet at the same time contracting their back muscles. This spot was marked to ensure pre and post measures were taken at the same location. The distance and width from the base of the spine was measured to locate the same spot for their 2nd session.

The intervention was conducted by a physiotherapist with extensive experience in spinal mobilisation therapy. The intervention involved mobilisations on the lumbar spine (L1 to L5) for 30 minutes on the determined side of the participant lying prone. The control session involved no physical touch. The participant lay either prone or supine on the same plinth and encouraged to relax for 30 minutes.

Outcome measures

Measurements for para-spinal muscle stiffness, tone and elasticity were taken using a myometer palpation device (MyotonPRO). This previously validated handheld device has been documented to give reliable results for muscle stiffness, tone and elasticity. The myometer uses a series of low force mechanical impulses registered as an oscillation in the form of an acceleration signal. The stiffness, tone and elasticity parameters are reported as a mean of these impulses along with the coefficient of variation (CV). Values were only accepted if the CV was <3%, complying with the manufacturer recommendations.

Statistical Analysis Plan

Participant data was stored on password protected excel files on University computers. All participant names were replaced with a pseudonym and therefore participant data was not identifiable. Summary data was then used for statistical analysis.

Analysis was carried out on each dependent variable (muscle stiffness, tone and elasticity) in separate 2-way repeated measure within participant ANOVAs. This was to determine any significant differences occurring due to the independent variables (condition and time). Covariates were also assessed in separate ANCOVAs to determine any significant factors contributing to their changes. All statistical analysis was out using SPSS 23 with the alpha level set at 0.05.