Use of simulation tools for assessment and skill development during a two-day post-graduate course on manual therapy skills

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Aims

The aims of this paper are to consider 1) the usefulness of a mechanical simulation of the cervical spine to assess skill in differentiating spinal stiffness and 2) the effectiveness of an inexpensive take-home force-feedback device in training therapists to accurately reproduce target forces.

Background

Short courses are important for postgraduate continuing education of physiotherapists. Assessment of stiffness during palpation is considered a core physiotherapy skill and experts, at least in some professions, are known to have a greater ability to discriminate stiffness than novices [1]. It is unclear whether the ability of therapists to discriminate stiffness can be improved by short course participation.

Secondly, a consistent magnitude of force is necessary for safety and effectiveness of techniques, but forces applied by different therapists differ by up to 500% [2, 3]. Consistency of applied forces can be improved by real time feedback [4, 5], but most methods of providing feedback impact adversely on performance of the technique. The authors developed a novel method of providing feedback on applied forces. This study evaluates the usefulness of this device.

Methods

Local ethics review committee approval was obtained. Twenty three qualified physiotherapists (between 2 and 6 years experience) participated who were
undertaking a two day course focussing on manual assessment and treatment of the cervical spine. On completion of the course, participants were provided with a device for providing real-time feedback on applied forces. The participants' ability to discriminate stiffness and reproduce target magnitudes of force were assessed immediately before, immediately after, and on follow-up two months after completion of the course.

Accuracy of the participants' ability to discriminate stiffness was assessed by their ability to correctly identify which of five suspended modules of a custom made spinal simulator had an altered level of stiffness. The accuracy of participants' ability to reproduce target loads onto a patient of 1, 3 and 5 pounds force was assessed with the participants standing on a force platform. The change in reaction force on the force platform was compared to the target force.

Results
The follow-up data has not been collected. It was hypothesized that at the conclusion of the course which focussed on discriminating stiffness in vivo, that the participants' ability to discriminate stiffness on a simulated palpation task would improve and it was further hoped that continued improvement would be found at follow-up. The participants' accuracy in applying a force of known magnitude on the other hand would only be expected to improve at the follow-up assessment after they had access to the novel feedback device.

Conclusions
The results will begin to clarify the relationship between skills gained through clinical teaching and objective measures of skill in stiffness discrimination. Secondly the results will indicate the potential usefulness of a home device for improving consistency of force application during physiotherapy assessment and treatment.
Bibliography


