

COMPARISON OF THREE DIFFERENT DENSITY TYPE FOAM ROLLERS ON KNEE RANGE OF MOTION AND PRESSURE PAIN THRESHOLD: A RANDOMIZED CONTROLLED TRIAL

Scott W. Cheatham, PhD, DPT, PT, OCS, ATC, CSCS¹

Kyle R. Stull, DHSc, MS, LMT, CSCS, NASM-CPT, CES²

ABSTRACT

Background: Foam rolling is a popular form of roller massage. To date, no studies have examined the therapeutic effects of different density type rollers. Understanding the different densities may provide clinicians with the knowledge to accurately prescribe a particular foam roller and safely progress the client.

Purpose: The purpose of this study was to compare the immediate effects of three different density type foam rollers on prone passive knee flexion range of motion (ROM) and pressure pain thresholds (PPT) of the quadriceps musculature.

Study Design: Pretest, posttest randomized controlled trial.

Methods: Thirty-six recreationally active adults were randomly allocated to one of three groups: soft density, medium density, and hard density foam roller. The intervention lasted a total of two minutes. Outcome measures included prone passive knee flexion ROM and PPT. Statistical analysis included parametric and non-parametric tests to measure changes among groups.

Results: Between group comparisons revealed no statistically significant differences between all three rollers for knee ROM ($p = .78$) and PPT ($p = .37$). Within group comparison for ROM revealed an 8° ($p < 0.001$) post-intervention increase for the medium and hard density rollers and a 7° ($p < 0.001$) increase for the soft density roller. For PPT, there was a post-intervention increase of 180 kPa ($p < 0.001$) for the medium density roller, 175 kPa ($p < 0.001$) for the soft density roller, and 151 kPa ($p < 0.001$) for the hard density roller.

Conclusion: All three roller densities produced similar post-intervention effects on knee ROM and PPT. These observed changes may be due to a local mechanical and global neurophysiological response from the pressure applied by the roller. The client's pain perception may have an influence on treatment and preference for a specific foam roller. Clinicians may want to consider such factors when prescribing foam rolling as an intervention.

Level of evidence: 2C

Keywords: Massage, muscle soreness, perceived pain, recovery, roller

CORRESPONDING AUTHOR

Scott W. Cheatham, PhD, DPT, PT, OCS,
ATC, CSCS

Associate Professor

California State University Dominguez Hills
1000 E. Victoria Street, Carson, California 90747

E-mail: Scheatham@csudh.edu

¹ California State University Dominguez Hills, Carson, CA, USA

² National Academy of Sports Medicine, Chandler, AZ, USA

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