

20 UNDERGRADUATE RESEARCH CRITIQUE

Research Critique on “Effects of Finger Taping on Forearm Muscle Activation in Rock Climbers”

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ABSTRACT

Introduction: A common injury among rock climbers is the flexor tendon pulleys because they use the fingers more than any other sport. Typically, climbers try taping their fingers to aid injury prevention to the flexor tendon pulleys. However, it is unclear the effect of taping on finger muscles activation.

Purpose: The purpose of this critiqued article is to determine if finger taping is effective in reducing flexor tendon pulley injuries in rock climbers by examining the change of muscle activation in the flexor digitorum superficialis (FDS) and flexor digitorum profundus (FDP) muscles.

Methods: Ten expert rock climbers (men, 21.0 ± 1.7 years) performed a hanging position for six seconds, requiring a crimp grip and elbow angles between 85° to 95° with no tape, H-taped (Schöffl et al (2007), and circular taped (traditional). The angle of their elbows was determined by a 2D Electrical Goniometer (Noraxon). Electromyogram (EMG, Noraxon DTS) was placed on flexor digitorum superficialis (FDS) and flexor digitorum profundus (FDP) muscles of just the subject's right arm to measure muscle activities during trials. The amplitude of FDS and FDP muscles was quantified as root mean square (RMS). Two-way repeated ANOVA Data was performed to determine the differences.

Results: Taping had no significant effect on the muscle activation of the forearm muscles ($p = 0.069$). Additionally, FDS and FDP demonstrated similarity ($p = 0.822$).

Discussion: Finger taping does not affect the relative muscle activation of the FDS and the FDP muscles during a static hang test of healthy men rock climbers. Therefore, taping may not be an effective measure to prevent flexor tendon pulleys.

Critique: The purpose of this study was to determine if finger taping was an effective preventative measure against finger flexor tendon pulley injuries in rock climbers by comparing involved muscle

activity (FDS and FDP). The findings suggested that taping is ineffective in preventing flexor tendon pulley injuries because there was no significant effect in the muscle activation between taped and untaped fingers. The limitations of this study are 1) there were only 10 participants and 2) a hang test is not an adequate representation of rock climbing because rock climbing is a very dynamic activity and sport that utilizes large amounts of muscle control and tendon strain that cannot be depicted from a static hang. In the future, this study should be replicated using more subjects. Muscle activation should be measured while the subjects are vertically climbing. The article states that subject experience may influence the outcome of this study and that they may have different results if their subjects climbed more often compared to an average of 5 hours per week because they are more at risk to injury; I do believe that because they're climbing routes are more challenging that more experienced climbers are at higher risk to injury, however, if the data is to be taken in a controlled setting (lab) then the risk is removed since it is unethical to make a subject participant in anything dangerous. Finally, even though this was the first study to determine if taping could prevent injuries by examining forearm muscle activation, the outcome of this study was expected. All prior studies showed that finger taping is not an effective measure to prevent flexor tendon pulley injury, but instead is more effective in already injured fingers. Overall, I think there is changes that need to be done in order to improve the accuracy of this study; increase participant count and the use of dynamic muscle activation.

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