UNIVERSITI TEKNOLOGI MARA

TYPES OF MUSCLE ACTIVATED DURING CRUNCH PERFORMED TRADITIONALLY AND ON STABILITY BALL

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Dissertation submitted in partial fulfilment of
the requirement for the degree of
Master of Sports Science

Faculty of Sports Science and Recreation

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AUTHOR'S DECLARATION

I declare that the work in the dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledge as referenced work. This dissertation has not been submitted to any other academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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Abstract

Back pain is one of the most common reasons for medical leaves, health care use and sickness benefits. An overly contracted low back muscles combined with a weak abdominal muscles are the typical cause of back pain. To overcome the problem, the abdominal muscles need to be physically stronger in order to be free from pain. Thus, this study was carried out to determine the intensity of abdominal muscle contraction between crunch performed traditionally and on stability ball, so that it can be used to prescribe a time efficient and cost effective mode to improve several health and performance parameters. Fifteen sedentary female university students with no previous history of back pain or injuries were recruited for the study. Muscle activity was assesed using surface electromyography (EMG) recorded using Delsys DE-2.3 differential surface electrodes during crunch performed traditionally and on stability ball. EMG electrodes were placed in the four tested regions upper rectus abdominis, lower rectus abdominis, external oblique and transversus abdominis. The result of this study showed that of the four muscles tested, only two muscles elicited significant difference on the intensity of contraction when performed on stability ball compared to the traditional crunch. There were significant difference existed between transversus abdominis (21.26 ± 4.44 mV) and lower rectus abdominis (16.78 ± 8.14 mV) performed traditionally and on stability ball. It was discovered that abdominal crunch performed on unstable surface recruited more muscle than traditional crunch. This is because in order to gain balance, the body must maintain muscular control, balance, coordination and proprioception. In order to gain core stability development, the core must be challenged to elicit the degree of co-contraction. The challenge can be provided by stability ball thus, produces desirable strength of abdominal muscle.

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