Department of Biomechanics

Doctoral Degree
2012

Author	**:**	**Ghada Abdel Honeim Mohamed.**
Title	**:**	**Effect of kinesio taping on isokinetic parameters of ankle joint.**
Dept.	**:**	**Department of Biomechanics.**
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	2.	**Ahmed Yousry Radwan.**
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Degree	**:**	**Doctoral.**
Year	**:**	**2012.**
Abstract	**:**	

This study was conducted to explore the changes that may occur in the peak torque of ankle evertors and invertors as well as the ankle EV/INV strength ratios at angular velocities 30º/sec and 120º/sec as a result of applying different taping modes (No tape, athletic tape and kinesio tape). Testing procedure was conducted using the Biodex isokinetic dynamometer. Results revealed significant difference between the three examined taping modes in the evertor PT, the EV_{ECC}/INV_{CON} strength ratio at 30º/sec and 120º/sec and the eccentric invertor PT at 120º/sec. However, no significant difference was reported in the invertors PT at 30º/sec, the concentric invertor PT at 120º/sec and EV_{CON}/INV_{ECC} strength ratio at 30º/sec and 120º/sec.

Key words	**1.**	**Kinesio taping.**
	2.	**Isokinetic parameters.**
	3.	**Ankle joint.**
Arabic Title Page	**:**	**تأثير استخدام الكنيسوتاب على القياسات الأيزوكينيتيكية لمفصل الكاحل.**
Library register number	**:**	**3087-3088.**

Author	**:**	**Hossam Eddein Fawaz.**
Title	**:**	**Evaluation of the Isokinetic Core Muscles Strength in Chronic Low Back Pain Patients.**
Dept.	**:**	**Department of Biomechanics.**
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Year	**:**	**2012.**
Abstract	**:**	

Background: Despite the vast amount of research that was performed to determine the effectiveness of trunk flexors' and extensors' strengths as a key component of core muscles in patients with chronic low back pain (CLBP), very limited information exists to determine the effectiveness of other core muscles' strength acting on the hip and knee joints in these patients. Purpose: The current concern is to investigate the isokinetic strength values of all core muscles involving the trunk, hips, and knees simultaneously. Subjects and Methods: Twenty male patients suffering from CLBP with mean age, weight, height, and BMI values of 29.6±3.5 years, 77.2±7.4 kg, 180.9±5.4 cm, and 23.6±1.3 kg/m², respectively. Twenty healthy male individuals serving as control with mean age, weight, height, and BMI values of 30.2±3.3 years, 74.8±8.2 kg, 178.9±6.9 cm, and 23.3±1.4 kg/m², respectively participated in this study. The Biodex System III Isokinetic Dynamometer was used for collecting the peak torque (PT) values from trunk flexors and extensors, hip flexors, extensors, abductors, and adductors, and knee flexors and extensors. All isokinetic muscle testings were performed in concentric mode of muscle contraction at an angular velocity of 60°/sec. The PT data from the patient and control groups were compared using MANOVA. Results and Discussion: The findings showed that although trunk extensors in the patient group were weaker to a great extent than trunk flexors, both muscle groups were found to be significantly weaker in the patient group compared with the healthy controls ($p<0.025$). Also, the findings demonstrated that there is a significant decline in the hip flexors', extensors', abductors', and adductors', and knee flexors' and extensors' strengths in the patient group in both the dominant and non-dominant limbs ($p<0.025$). However, there is no significant difference in the hip flexors', extensors', abductors', and adductors', and knee flexors' and extensors' strengths between the dominant and non-dominant limbs in both the controls and patients ($p>0.025$). Conclusion: This study proved that there are many core muscles and building core muscle strengths acting on the hip and knee joints that require much more concern than just trunk flexors and extensors. This finding implies that muscle weakness in patients with CLBP is not just a local problem of the trunk, but a generalized problem extending to the hip and knee joints. Consequently, this study recommends the need for a hip and knee muscles' reinforcement program in addition to reinforcement of the trunk flexors and extensors in rehabilitating patients with CLBP. In turn, this may help physiotherapists in designing the most effective and efficient prevention and rehabilitation programs for patients suffering from CLBP.

Key words	**1.**	**CLBP (Chronic Low Back Pain).**
	2.	**Isokinetic**
	3.	**Muscle Strength**
	4.	**Core Muscles.**
Arabic Title Page	**:**	**التقييم الايزوكينيتيكي لقوة العضلات المحورية لمرضى آلام أسفل الظهر المزمن.**
Library register number	**:**	**2845-2846.**

Author	**:**	**Nadia lotfy Radwan Mohamed.**
Title	**:**	**Effect of core training onstability of lumbar spine during carring.**
Dept.	**:**	**Department of Biomechanics.**
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Degree	**:**	**Doctoral.**
Year	**:**	**2012.**
Abstract	**:**	

This study was conducted to examine the effect of (CS) training on the local and global stability of the lumbar spine during carrying and to detect the changes in the performance of the core stabilizers after performing this training. Thirty five female participated in the study. They were randomly assigned to two groups; experimental and control groups. The participants were tested twice; before and after a 6 week period during which the experimental group performed (CS) program. Results showed that there were significant decreases in both the local and global lumbar motions while there were significant increases in the trunk muscle endurance time in the experimental group.

Key words	**1.**	**Core stability.**
	2.	**lumbar spine.**
	3.	**spinal mouse.**
	4.	**Carrying.**
Arabic Title Page	**:**	**تأثير التدريب المحوري على ثبات الفقرات القطنية أثناء حمل ثقل.**
Library register number	**:**	**3089-3090.**

Author	**:**	**Radwa Eid Sweif.**
Title	**:**	**Evaluation of Mechanical and Physiological Gait Efficiency following Anterior Cruciate Ligament Reconstruction.**
Dept.	**:**	**Department of Biomechanics.**
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Degree	**:**	**Doctoral.**
Year	**:**	**2012.**
Abstract	**:**	

This study was designed to compare the physiological and mechanical measures of gait efficiency in patients with ACL reconstruction (ACLR) with those of matched healthy control individuals and correlate among these measures. The study was conducted on 17 patients who were operated on 6 months prior to testing (group A) and 16 healthy individuals (group B). Group (A) should have completed their accelerated rehabilitation program during the 6-month period. The mean values ± SD of age, height and weight for group (A) versus group (B) were 23.06±4.76 vs 24.85±6.47 years, 173.93±6.54 vs 175.64±7.37 cm and 74.25±12.1 vs 76.52±10.14 Kg respectively. The mechanical measures were collected using a 3D Motion Analysis System, while the physiological measures were collected after performing the 6 minute walking test. MANOVA showed that there is significant difference between both groups for the tested variables (p=0.000). Knee rotation during loading response, Rate of Perceived Exertion (RPE) and Physiological Cost Index (PCI) decreased significantly in group (A) compared with group (B) with no significant difference in-between for the Biomechanical Efficiency Quotient (BEQ) and speed of walking. In addition, there were significant strong positive correlations between each of the tested physiological measures of gait efficiency (PCI & RPE) and each of the tested mechanical measures of gait efficiency (BEQ, speed of walking and knee rotation during loading response) in either tested group. It was concluded that there is an alteration in both mechanical and physiological measures of gait efficiency in patients with ACLR six months post operatively after completing their accelerated rehabilitation program, clarifying the need for performing endurance training as well as knee stability training beside the accelerated rehabilitation program. Moreover, the obtained positive correlation among the tested mechanical and physiological measures indicates that using either of these measures for evaluating gait efficiency is acceptable.

Key words	**1.**	**ACL Reconstruction (Anterior Circulate Ligament Reconstruction).**
	2.	**Mechanical.**
	3.	**Physiological.**
	4.	**Gait Efficiency.**
Arabic Title Page	**:**	**تقييم الكفاءة الميكانيكيه والفسيولوجية للمشي بعد إعادة بناء الرباط الصليبي الأمامي.**
Library register number	**:**	**2863-2864.**