Department of Biomechanics

Master Degree

2013

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Title	**:**	**Effect of Core Stability Exercises on Trunk and Hip Muscles Performance in Healthy Adults.**
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Degree	**:**	**Master.**
Year	**:**	**2013.**
Abstract	**:**	

The purpose of the current study was to investigate the effect of beginners' core stability exercises on trunk flexors', extensors', hip flexors', extensors', abductors', and adductors' peak torques in healthy adults. Thirty two healthy individuals, volunteered to participate in the study, were subdivided into experimental and control groups. The experimental group involved 17 participants (5 males and 12 females) and the control group involved 15 participants (5 males and 10 females). Peak torque data were collected using the Biodex Isokinetic system 3 at angular velocity of 60°/s and concentric contraction mode. The participants were tested twice; before and after a six week period during which the experimental group performed the beginners' core stability training program. Statistical analysis using the 2x2 Mixed Design MANOVA revealed that there was a significant increase of the post testing mean values of trunk flexors', extensors', hip flexors', extensors', and adductors' peak torques compared to the pre testing values in the experimental group ($p < 0.05$). There was no significant difference in the post testing peak torque values of trunk flexors, extensors, hip flexors, extensors, abductors, and adductors in the control group compared to the pre testing values ($p > 0.05$). Moreover, there was a significant increase in the post testing mean values of hip extensors' and adductors' peak torques in the experimental group compared to that in the control group ($p < 0.05$). On the other hand, there was no significant difference in the post testing mean peak torque values of trunk flexors, extensors, hip flexors, and abductors between groups. Conclusion: Beginners' Core stability exercises have significant effects on trunk and hip muscles strength, especially hip extensors and adductors. They can be included in the exercise programs to improve trunk and hip muscles performance.

Key words	**1.**	**Core stability.**
	2.	**Isokinetic.**
	3.	**Trunk muscles.**
	4.	**Hip muscles.**
Arabic Title Page	**:**	**تأثير تمرينات الثبات المحورى على أداء عضلات الجذع والفخذ فى البالغين الأصحاء.**
Library register number	**:**	**3121-3122.**

Author	**:**	**Mervat Mohamed Zakaria Hamed Hefney.**
Title	**:**	**Effect of Different Types of Backpack Carrying on Dynamic Balance in Normal Subjects.**
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Abstract	**:**	

Purpose The purpose of this study is to investigate the postural stability elicited by young adults while standing with different types of backpack carrying systems (bilateral straight–bilateral crossing–unilateral crossing). Methods: Twenty normal female subjects participated in this study. Their weight ranged from 45 to 64 kg, age ranged from 17 to 25 years and height from 152 to 165 cm. Each subject carried backpack load equal to 15 % of the subject's body weight. Each subject carried the backpack three times (each time with each backpack carrying system). In each time, dynamic balance was measured using Biodex Balance System. Results: the study showed statistically non-significant difference between the mean values of each parameter of the test in the three types of backpack carrying system. There was a significant correlation among overall stability index (OASI), anteroposterior stability index (APSI) and mediolateral stability index (MLSI) in the three types of backpack carrying systems. Conclusion: this study concluded that backpack carrying systems had an effect on dynamic balance in anteroposterior, mediolateral and overall direction with non-significant difference in the mean values of each parameter of dynamic balance test in each type of carrying backpack.

Key words	**1.**	**Balance.**
	2.	**Dynamic Balance.**
	3.	**Backpack.**
	4.	**Biodex Balance System.**
Arabic Title Page	**:**	**تأثير الطرق المختلفة لحمل حقائب الظهر على الاتزان الحركى عند الأشخاص الأصحاء.**
Library register number	**:**	**3519-3520.**

Author	**:**	**Omaima Ezz-eldeen Saleh.**
Title	**:**	**Effect of Core Stability Exercises on Trunk proprioception in Healthy Adult individuals.**
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Abstract	**:**	

Background: **Core stability training has recently attracted attention for improving muscle performance. The purpose of this study was to investigate the effect of beginners' core stability exercises on trunk active repositioning error at 30 and 60 degrees trunk flexion.** ***Methods:*** **Forty healthy males, randomly assigned into two groups; experimental (group I) and control (group II), participated in the study. Group I involved 20 participants with mean±SD age, weight and height of 19.35±1.11 years, 70.15±6.44 kg and 174.7±7.02 cm respectively. Group II involved 20 participants with mean±SD age, weight and height of 20.45±1.64 years, 72.45±6.91 kg and 176.3±7.24 cm respectively. Data were collected using the Biodex Isokinetic system at an angular velocity of 60º/s. The participants were tested twice; before and after a 6-week period during which the experimental group performed a core stability training program.** ***Findings:*** **The Mixed 3-way ANOVA revealed that there were significant increases ($p<0.05$) in the absolute error (AE) at 30˚ compared with that at 60˚ flexion in the pre-test conditions of the experimental and control groups and the post-test condition of the control group. However, there was no significant difference ($p>0.05$) in the AE between both tested ranges of motion in the post-test condition for the experimental group. Moreover, there were significant decreases ($p<0.05$) in the AE at both 30˚ and 60˚ flexion in the experimental group. However, there were no significant differences ($p>0.05$) in the AE between the pre- and post- tests' conditions in the control group tested at 30˚ and 60˚ flexion. Finally, there were no significant differences ($p>0.05$) in AE between the tested groups in the pre-test condition at 30˚ and 60˚ flexion. While, there were significant decreases ($p<0.05$) in the AE in the experimental group compared with the control group in the post-test conditions at 30˚ and 60˚ flexion.** ***Interpretation:*** **The improvement in trunk proprioception indicated by the decrease in the active repositioning error in the experimental group recommends including core stability training in the exercise programs that aim to improve trunk proprioception.**

Key words	**1.**	**Core stability.**
	2.	**Isokinetic.**
	3.	**Trunk proprioception.**
Arabic Title Page	**:**	**تأثير تمرينات الثبات المحوري علي عمل المستقبلات الحسية العميقة للجزع في الأفراد البالغين الأصحاء.**
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