

## LUMBAR CORE STRENGTH COMPARISON BETWEEN SKATERS AND NON-SKATERS

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### ABSTRACT

*Core muscles play a crucial role in the interaction between repetitive limb movements and the effects they have on the body. Poor core strength is considered to be one of the leading causes of low back pain and injuries associated with sport specific performances. The aim of this study was to establish whether there was a significant difference in the lumbar core strength of skaters, when compared to that of age matched non-skaters. Measures should be taken towards achieving a good core strength as a pre-emptive as well as a curative step against low back pain, among skater and the general population not participating in any sport specific performance*

*Aims & Objectives: This study sought to assess and compare the lumbar core strength of skaters and non-skaters.*

*Study design: Observational study*

*Methodology: A total of 100 participants were selected, 50 skaters and 50 non-skaters, between the ages of 15 to 25 years. The skaters were those who had a minimum of 1 year training without any complaints of low back pain, fracture, etc. and non-skaters were individuals who did not participate in any other form of training. The pressure bio-feedback method was explained to all the participants. Their consent was obtained. The core strength of the participants was then assessed and compared using Unpaired t-Test in Microsoft excel 2007.*

*Results: After comparing the data, it was found that the mean core strength of the skaters (case group) was  $6.12 \pm 1.99$ , and that of the non-skaters (control group) was  $4.56 \pm 2.28$ . The p value obtained was 0.00, which implied that there was a significant difference between the two groups, with the case group having greater core strength value.*

*Conclusion: Thus, it was found that, statistically, the lumbar core muscle strength of the case group i.e. skaters was significantly more than that of the control group i.e. non-skaters.*

**KEYWORDS:** Lumbar core, strength, skaters, adolescence, adult

### INTRODUCTION

Skating is defined as, “The action or activity of skating on ice skates, roller skates, or a skateboard as a sport or pastime.” Various position, elaborate moves and speed are all a part of skating. Good lumbar core strength is required for holding the positions, executing the movement and achieving high speeds<sup>1,2,3</sup>.

There are predominantly two forms of skating i.e. speed and artistic. Common injuries sustained by skaters are, fractures of the tibia, femur and distal radius due to falls at the apex of the turn, cervical spine fractures also associated with falls, brachial plexus traction injuries in skaters who attempt to protect their head during a fall on outstretched arm, low back pain, muscle strain and overuse injuries of the hip adductors, hip flexors and hamstrings, overuse syndromes such as patellar tendonitis, anterior knee pain, Achilles tendonitis and exertional compartment syndrome<sup>4,5</sup>.

The lumbar core muscles are pelvic floor muscles, transversus abdominis, multifidus, internal and external obliques, rectus abdominis, erector spinae (sacrospinalis). Focus on core strengthening is crucial to address and prevent

overuse injury and strain to the lumbar spine, hip, and hamstring. Core stability against dynamic movements of the extremities and capability to absorb repetitive loading forces in the trunk play a crucial role in any professional sport specific performance<sup>2,3</sup>.

### MATERIALS AND METHOD

A total of 100 participants were selected, 50 skaters and 50 non-skaters, between the ages of 15 to 25 years. The skaters were those who had a minimum of 1 year training without any complaints of low back pain, fracture, etc. and non-skaters were individuals who did not participate in any other form of training. The pressure bio-feedback method was explained to all the participants. Their consent was obtained. The core strength of the participants was then assessed and noted.

**Statistical analysis:** The data of the two groups was compared using unpaired t-Test in Microsoft Excel 2007.

### RESULTS

As it can be observed from the result table, the mean core strength of the case group (i.e. the skaters group) was  $6.12 \pm 1.99$  and that of the control group was  $4.56 \pm 2.28$ . After comparing the obtained data in Microsoft Excel

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2007 the p value obtained was 0.00. As the p value lies between +0.05 and -0.05, the p value was found to be significant. This implied that there was a significant difference between the core strength of the two groups, i.e. the case and control group, with the case (skaters) group having a higher core strength value.

TABLE 1: MEAN CORE STRENGTH

Mean core strength (case group)	Mean core strength (control group)	P value	
6.12 ± 1.99	4.56 ± 2.28	0.00	significant

## DISCUSSION

The objective of this research was to establish whether the lumbar core strength of skaters was equal to or greater than that of age matched non-skaters. As observed from the result table, the core strength of the skaters group was greater than that of the non-skaters group.

The subjects included in the control group were individuals who did not participate in any regular physical activities and overall lead a sedentary lifestyle. Participation of adolescence in physical activity, outside the physical education classes conducted on a fairly regular basis in most of the schools, is low.

This is due to reduced interest in physical forms of entertainment and more in indoor forms of entertainment, with minimum or no physical activity<sup>2</sup>. In the adolescence and adult age group i.e. 16 to 25 year age group, the level of physical activity is also low<sup>2</sup>. Various scholastic and career demands, timings and stresses, leaves the individual with reduced time and energy to spend on physical activities<sup>7</sup>. This lack of physical activity is one of the reasons that the core strength of the control group was found to be less/average.

The subjects in the case group were skaters with at least one year training. In the sport of skating, recruitment of the core muscles occurs in order to achieve and maintain the various positions and high speeds<sup>3,8</sup>. For example, skaters perform jumps such as the Axel jump, described as one of the most difficult jumps which takes off from the forward outside edge of one foot and lands on the back outside edge of the opposite foot. In the initial part of this move, there is a forward and upward propulsion of the body with an acceleration in the skater's speed, and in the latter half there is a backward and downward descent, with a deceleration<sup>3,6</sup>. Due to the upward propulsion and the downward descent, there is a constant change in the centre of gravity while the skater is performing this jump. Also, there is a reduced base of support as the skater pushes off as well as lands on one leg. In order to execute this move correctly as well as to maintain the body

stability and balance during the various stages of the move, the skater is required to activate his or her core<sup>2,6</sup>.

One needs to practice this jump repeatedly in order to execute it with grace and finesse. Due to this, and many other such complex and intricate aspects of skating, repeatedly practiced over a year or more, there is an increase in the lumbar core strength of this group.

## CONCLUSION

Thus, it was found that, statistically, the lumbar core muscle strength of the case group i.e. skaters was significantly more than that of the control group i.e. non-skaters.

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