

Title	A study on statical strength of squat exercise measured by "Tremax system"
Sub Title	
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Publisher	慶應義塾大学体育研究所
Publication year	1994
Jtitle	体育研究所紀要 (Bulletin of the institute of physical education, Keio university). Vol.34, No.1 (1994. 12) ,p.143- 143
JaLC DOI	
Abstract	
Notes	Abstract
Genre	
URL	https://koara.lib.keio.ac.jp/xoonips/modules/xoonips/detail.php?koara_id=AN00135710-00340001-0143

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A Study on Statical Strength of Squat Exercise Measured by “Tremax System”

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Tremax system consists of a device and evaluating system to measure statical strength of various muscles. We measured statical muscle strength of squat exercise in various postures—from full squat to upright posture—by this system.

All six subjects were members of a Judo club at Keio University.

Their strength in various postures were almost the same. i.e. The strength decreased gradually from full squat position(point A) and became minimum(C) just after half squat position(B). Then, the strength increased rapidly and came to maximum(D) before upright posture.

At the point A, bar position was 39.9%(s.d.= ± 1.0) of subjects' heights on the average, the strength was 44.2%(s.d.= ± 9.6) as compared with their own maximum strength, and knee joint angle was 32.6°(s.d.= ± 10.1) on the average.

At the point B, bar position was 54.6%(s.d.= ± 1.0), and the strength was 28.3%(s.d.= ± 4.8) and knee joint angle was 60.9°(s.d.= ± 5.1).

At the point C, bar position was 57.5%(s.d.= ± 2.5), and the strength was 25.8%(s.d.= ± 5.0) and knee joint angle was 69.7°(s.d.= ± 4.9).

At the point D, bar position was 76.8%(s.d.= ± 1.9), and knee joint angle was 121.3°(s.d.= ± 12.6).

Compared with other postures, half squat position may be better position to measure statical strength of squat exercise.

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