

# 高齢者への異なる関節角度の 自重負荷スクワットトレーニングの効果

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## Effect of Two Different Knee Joint Angle Squat Trainings on Knee Extension Peak Torque, Muscle Thickness and Physical Functions in Older Individuals

by

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### ABSTRACT

The purpose of this study was to investigate the effect of depth in squat exercise on knee extension peak torque, muscle thickness and physical functions. Twenty-one participants were randomly assigned large angle change squat (LAC-squat) groups (age,  $69.1 \pm 3.3$ ) and small angle change squat (SAC-squat) groups (age,  $72.1 \pm 4.5$ ). Participants touch the hip on the 40 cm and 60 cm height chairs during LAC-squat and SAC-squat. They performed 2 sets of 68 times squat per day, 3 days per week, for 12 weeks, and their knee extension peak torque, muscle thickness and physical functions were measured before and after the intervention. As the result, 30 sec sit-to-stand repetition and 1 repetition maximum of leg press were significantly improved after the training in both groups ( $p < 0.05$ ). Muscle thickness was significantly increased only in LAC-squat group ( $p < 0.05$ ). These findings indicated that the weight-bearing squat training in the older adults was recommended from the perspective of the prevention of sarcopenia and the maintenance of independent activities of daily living. On the other

hand, this result suggests that the difference of knee joint angle during squat training may relate with the effects of squat training.

## 要 旨

本研究では、異なる沈み込み条件の自重負荷スクワットを設定し、それらのトレーニング効果を検討した。異なる条件のスクワットとして関節角度変化の大きいスクワット (LAC-squat) と小さいスクワット (SAC-squat) を設定した。LAC-squatは40cmのイスに、SAC-squatはその椅子の上に置いた20cmのクッションに臀部をつけるよう指示され、それぞれ68回実施した。高齢者21名を対象に、各スクワットを用いて12週間トレーニングを実施した。その結果、両群にてイス座り立ちテストとレッグプレスの1RMが有意に増加し、LAC-squat群において外側広筋の筋厚が有意に増加した。この結果は高齢者でのスクワットトレーニングの有用性を示した一方、スクワットの関節角度変化の違いはトレーニング効果の一部に影響を与える可能性が示唆された。