

# Efektivitas latihan nordic hamstring sebagai latihan tambahan terhadap perbaikan faktor risiko cedera otot hamstring pemain futsal = Effectiveness of nordic hamstring exercise as adjuvant exercise to improve injury risk factor on futsal players hamstring muscle / Zeth Boroh

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## Abstrak

[<b>ABSTRAK</b><br>

Penelitian ini bertujuan untuk mengetahui efektivitas latihan Nordic hamstring sebagai latihan tambahan dalam upaya perbaikan faktor risiko cedera otot hamstring pemain futsal. Total pemain futsal (usia 18-21 tahun) berpartisipasi pada penelitian ini, 15 pemain pada kelompok kontrol dan 16 pemain pada kelompok perlakuan. Kelompok perlakuan melakukan latihan rutin ditambahkan latihan Nordic hamstring selama 4 minggu (protokol 4 minggu) dan kelompok kontrol melakukan latihan rutin. Pengukuran kekuatan otot hamstring dan quadriceps dilakukan sebelum dan setelah perlakuan pada kedua kelompok dengan memakai alat isotonik dinamometer. Perubahan hasil pengukuran dalam setiap kelompok sebelum dan setelah perlakuan diolah menggunakan uji-t berpasangan ( $p < 0,05$ ).

Hasil penelitian menunjukkan pada kelompok perlakuan mengalami peningkatan kekuatan otot hamstring ( $p = 0,029$  pada tungkai kanan dan  $p = 0,007$  pada tungkai kiri), terdapat perbaikan keseimbangan kekuatan otot hamstring kanan dan kiri ( $p = 0,016$ ), namun tidak ada perbaikan rasio kekuatan otot hamstring terhadap quadriceps. Pada kelompok kontrol, tidak terdapat peningkatan kekuatan otot hamstring, tidak ada perbaikan keseimbangan dan tidak ada perbaikan rasio kekuatan otot hamstring terhadap quadriceps. Hasil penelitian ini menunjukkan bahwa latihan Nordic hamstring protokol 4 minggu adalah sebuah program latihan yang efektif untuk memperbaiki faktor risiko cedera yang berperan dalam upaya pencegahan cedera otot hamstring.

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<b>ABSTRACT</b><br>

This research is to establish to know the Nordic hamstring exercise effectiveness as adjuvant exercise to improve injury risk factor on futsal players hamstring muscle. College student futsal players (age ranges 18 ? 21 year old) as participant in this research consist of 15 players as control group and 16 players as treated one. Treated one conducts routine exercise and Nordic hamstring exercise for 4 weeks (4 weeks protocol) and control group conducts routine exercise. Measurement of hamstring and quadriceps muscles strength are measured before and after treatment on both group by using isotonic dynamometer device. The difference of the results in both group before and after treatment are managed by using paired-t test ( $p < 0,05$ ).

The results shows that treated group improve their hamstring muscle strength ( $p = 0,029$  on right legs and  $p = 0,007$  on the left ones), improve the balance of their left and right

hamstring strength ( $p = 0,016$ ), but there is no improvement on hamstring and quadriceps muscles strength ratio. On control group, there is no hamstring muscle strength improvement, no balance improvement, and no improvement on hamstring and quadriceps muscles strength ratio. The result shows that 4 weeks protocol Nordic hamstring exercise is an effective programme to improve injury risk factor that has a role in preventing hamstring muscle injury. This research is to establish to know the Nordic hamstring exercise effectiveness as adjuvant exercise to improve injury risk factor on futsal players' hamstring muscle. College student futsal players (age ranges 18 – 21 year old) as participants in this research consist of 15 players as control group and 16 players as treated one. Treated one conducts routine exercise and Nordic hamstring exercise for 4 weeks (4 weeks protocol) and control group conducts routine exercise. Measurement of hamstring and quadriceps muscles strength are measured before and after treatment on both groups by using isotonic dynamometer device. The difference of the results in both groups before and after treatment are managed by using paired-t test ( $p < 0,05$ ).

The results show that treated group improve their hamstring muscle strength ( $p = 0,029$  on right legs and  $p = 0,007$  on the left ones), improve the balance of their left and right hamstring strength ( $p = 0,016$ ), but there is no improvement on hamstring and quadriceps muscles strength ratio. On control group, there is no hamstring muscle strength improvement, no balance improvement, and no improvement on hamstring and quadriceps muscles strength ratio. The result shows that 4 weeks protocol Nordic hamstring exercise is an effective programme to improve injury risk factor that has a role in preventing hamstring muscle injury.]