Vpliv redne vadbe hatha joge na gibljivost – pilotna študija

Maja Petrič, dipl. fiziot.; doc. dr. **Renata Vauhnik**, dipl. fiziot.; doc. dr. **Miroljub Jakovljević**, viš. fiziot., univ. dipl. org.

Univerza v Ljubljani, Zdravstvena fakulteta, Ljubljana

Korespondenca/Correspondence: Maja Petrič, dipl. fiziot.; e-pošta: maja.53c@gmail.com

Uvod: Telesna nedejavnost in pretežno sedeč življenjski slog sta dva izmed vodilnih vzrokov za zmanjšano gibljivost našega telesa (1). Posledice tega se kažejo v slabši prožnosti mehkih tkiv, ki obdajajo sklepe, kar onemogoča funkcionalno gibljivost posameznih sklepov (2). Z enostavnimi tehnikami joge, kot so jogijski telesni položaji in tehnike dihanja, lahko ponovno dosežemo optimalno gibljivost telesa (3, 4). Namen raziskave je bil raziskati kvantitativne učinke redne vadbe hatha joge na gibljivost pri zdravih mladih ženskah. **Metode:** V raziskavi je sodelovalo 9 zdravih mladih žensk, starih 23,8 (2,9) leta, ki so se prostovoljno prijavile na objavljeni oglas. Vadbeni program je potekal v obliki 75-minutnih vadb, dvakrat na teden, v obdobju petih mesecev. Vključeval je jogijske vaje, usmerjene v povečanje gibljivosti obravnavanih sklepov ter sproščanje in raztezanje skrajšanih skeletnih mišic. Za merjenje pasivne sklepne gibljivosti ramenskega, kolčnega ter zgornjega in spodnjega skočnega sklepa so bili uporabljeni standardizirani postopki goniometrije, za merjenje aktivne gibljivosti prsno-ledvenega dela hrbtenice so bile uporabljene linearne meritve, za ocenjevanje skrajšav skeletnih mišic pa so bili uporabljeni specifični testi skrajšav posameznih mišic oziroma mišičnih skupin (5) in dva testa splošne gibljivosti telesa. Meritve gibljivosti so bile v času raziskave izvedene trikrat; en teden pred začetkom vadbenega programa, po dveh mesecih vadbe in ob koncu petmesečnega vadbenega programa. **Rezultati:** Pri meritvah sklepne gibljivosti je prišlo do klinično (> 5°) in statistično ($p < 0,05$) pomembnega povečanja obsega giba elevacije skozi abdukcijo in retrofleksije ramenskega sklepa, fleksije, notranje in zunanje rotacije kolčnega sklepa, dorzalne fleksije in inverzije skočnega sklepa. Gibljivost prsno-ledvenega dela hrbtenice se je izboljšala v vseh merjenih smereh gibanja ($p < 0,05$). Izboljšala se je prožnost *m. Soleus*, *m. Gastrocnemius*, *m. Rectus femoris*, skupine mišic fleksorjev kolena in *m. Pectoralis major* (> 5°; $p < 0,01$). Pomembno izboljšanje gibljivosti sta prav tako pokazala oba uporabljena testa, »Dotik dlani na hrbtu« in »Doseg sede« ($p < 0,01$). **Zaključki:** Rezultati pilotne raziskave potrjujejo, da redna vadba hatha joge pri zdravih mladih ženskah pomembno vpliva na gibljivost, predvsem izboljšuje prožnost skrajšanih skeletnih mišic. V prihodnje bi bile vsekakor potrebne dodatne raziskave na večjem vzorcu preiskovancev s kontrolno skupino. Za večjo integracijo tehnik joge v fizioterapiji bi bile potrebne nadaljnje raziskave učinkov različnih tehnik joge pri različnih patologijah in poškodbah.

Ključne besede: gibljivost, joga, terapevtski učinki, goniometrija, raztezne vaje.

The impact of regular hatha yoga practice on flexibility – a pilot study

Background: Physical inactivity and predominantly sedentary lifestyle are two of the leading reasons for the diminishment of our body flexibility (1). The consequence of this is decreased flexibility of soft tissues surrounding joints (2). Simple yoga techniques including body postures and breathing techniques can restore optimal body flexibility (3, 4). The main purpose of this study was to examine the quantitative impact of regular hatha yoga practice on body flexibility in young healthy females. **Methods:** Nine young healthy females (mean age 23.8 (2.9) years), who have voluntarily applied for a public tender, participated in the study. The training program was held twice a week (in 75-minute sessions) over a period of five months. The program included therapeutic yoga exercises, with the aim of increasing joint mobility as well as stretching shortened skeletal muscles. We used goniometric measurement procedures for measuring passive joint mobility (for shoulder, hip and ankle joints), linear measurement procedures for measuring the active mobility of the thoracolumbar part of the spine and specific muscle length tests for evaluating skeletal muscle shortness of individual muscles/muscle groups (5) and overall body flexibility. Measurements of body flexibility were taken three times over the five months' period; at the beginning of the training program, after two months of training and at the end of the five months' training program. **Results:** The results obtained by measuring joint mobility showed significant increase ($> 5°$; $p < 0.05$) of mobility in elevation through abduction, shoulder retroflexion, hip flexion, internal and external hip rotation, dorsal flexion and inversion of the ankle. The mobility of the thoracolumbar part of the spine was increased in all the measured movements ($p < 0.05$). There was also a significant improvement in the flexibility of *m. Soleus*, *m. Gastrocnemius*, *m. Rectus femoris*, knee flexors and *m. Pectoralis major* ($> 5°$; $p < 0.01$). A significant improvement in body flexibility was also confirmed by the Back Scratch Test and the Sit and Reach Test ($p < 0.01$). **Conclusions:** The results of this pilot study confirm that regular practice of hatha yoga has a significant effect on body flexibility in young healthy women, especially with increasing of the flexibility of shortened skeletal muscles. Future research in this area using a larger sample of subjects and control group is needed. In addition, further research into the effects of yoga techniques in various pathologies and injuries is required in order to enhance the usefulness of yoga techniques in physiotherapy.

Key words: flexibility, yoga, therapeutic effects, goniometry, muscle stretching exercise.

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