

The Effect Of Prolonged Putting Practice On Low Back Movement: A Pilot Study

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Purpose:

The putt is the most frequently performed stroke during a round of golf and much time is spent practising this skill. The present pilot study aimed to determine whether 60 minutes of putting practice affected lumbo-pelvic movement during the putting stroke and whether any changes observed affected putting accuracy.

Methods:

Nine amateur golfers (eight male, one female with a mean age 28.3 [SD 6.3] years, height 179.3 [SD 11.4cm], body mass 76.2 [SD 12.6kg] and an Australian handicap of 3.9 [SD 1.4] strokes) with no current low back symptoms participated in this study. Lumbo-pelvic movement was evaluated using two wireless 3D motion sensors (Dorsa Vi Pty Ltd) and a portable recording device during 60 minutes of self-paced putting practice. Participants performed consecutive putting circuits, each consisting of 10 putts at distances of four, six and eight metres from the hole.

Analysis: For each participant, peak lumbo-pelvic flexion angle and changes in this angle over the duration of the putting practice were calculated. Frequency of "short term flexion" (<30 seconds) and "sustained flexion" (>30 seconds) was also calculated. The coefficient of variance (CoV) was calculated to give an insight into putting accuracy. The distance of unsuccessful putts from the hole was measured in centimetres, with successful putts recorded as 0cm. The correlation between the CoV and the mean peak flexion for the starting distance the putt was taken from was also performed.

Results:

Lumbo-pelvic flexion angle did not change for three golfers over the course of the putting practice session but six golfers showed a statistically significant decrease ($p < 0.05$) in lumbo-pelvic flexion after 40 minutes of putting practice. Each participant's pre-shot routine affected the frequency of sustained flexions vs short term flexions observed.

For example, one participant had no sustained flexions but one participant had 25 instances of sustained flexions between 20 and 40 degrees during the 60 minutes of putting. The CoV tended to increase over time, representing a decrease in accuracy over time, but both positive and negative correlations were found between CoV and mean lumbo-pelvic flexion for individual golfers.

Discussion:

This pilot study was the first to look specifically at lumbo-pelvic flexion of golfers during putting practice and the first to employ the DorsaVi, a portable 3D motion analysis system in a context specific environment. Interestingly, golfers either had no change in lumbo-pelvic flexion angle or became more upright over the ball during the putting session while none became more flexed. Not surprisingly, individual participants had different putting routines which were reflected in the frequency of short term vs sustained periods of lumbo-pelvic flexion. Generally there was a decrease in putting accuracy over time - whether this was related to changes in lumbo-pelvic angle or due to other factors such as loss of concentration needs further investigation.

Practical Application/Clinical Relevance:

The present study suggests that some golfers will become more upright over the ball after putting for any longer than 40 minutes. The reason for this is likely to be individual but may include fatigue of the trunk extensors, skill level, or loss of concentration but requires further investigation. Changes in lumbo-pelvic flexion angle have been reported in tasks that involve repeated or sustained flexion and these changes are thought to contribute to changes in performance and risk for low back pain.

This pilot study of asymptomatic golfers was intended to determine whether putting for a prolonged period results in changes in lumbo-pelvic flexion to inform a larger study investigating the relationship between lumbo-pelvic angle, fatigue of the trunk extensors and low back pain during putting.