Abstract

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Title: Correlation of dynamic postural stability parameters in relation to golf swing speed

Objectives: The aim of the study is to identify the relationship between dynamic postural stability parameters and club head speed during the golf swing with 7 iron and Driver clubs in female performance golfers. The sub-objectives are to determine the relationship between dynamic postural stability parameters and short stroke performance and to determine the relationship between dynamic postural stability parameters and long-term performance (golf handicap) and the relationship between long-term performance and club head speed. Dynamic postural stability parameters will be measured using the NeuroCom Smart Equitest. Golf swing skills will be measured using the TrackMan4 3D Doppler radar.

Methods: This study is a quantitative correlational study investigating the relationship of dynamic postural stability parameters with golf swing parameters. Female golfers n=10; in the age range of 18-34 years with a mean age of 24.3 years (±5.12 years), HCP (performance number) of 1.31 (±3.00), mean height of 168.35 cm (±5.09 cm), mean body weight of 63.35 kg (±8.79 kg) and mean BMI of 22.26 $kg.m^{-2}$ (±2.04 $kg.m^{-2}$), who have been playing golf for at least 4 years and play on the right side. Furthermore, they do not suffer from any major orthopaedic, neurological or internal disease and are not in recovery from major injury or surgery. The measurements were carried out in the laboratories of FTVS UK, specifically in the sports motor laboratory and in the laboratory of applied kinesiology. Measurement of dynamic postural stability parameters was performed using the NeuroCom Smart Equitest. Measurement of golf skills was performed with the TrackMan4 3D Doppler radar. Subsequently, dynamic postural stability parameters were selected from the Sensory organization test (SOT Comp), Adaptation test (ADT aADTUP, aADTDW), Motor control test (MCT Comp), Rhythmic weight shift (RWS DCL-LR Comp) and Limits of stability (LOS aRT, aDCL) test protocols. The golf swing skills selected were Club speed 7 iron (7i) and Driver, average total deviation in meters and percentage. The resulting data from both measurements were statistically processed, the Shapiro-Wilk normality test was performed, and then the data were subjected to correlation. Pearson's correlation coefficient r for a normal distribution of data and Spearman's correlation coefficient r_s for a non-normal distribution of data were used

to determine the strength of the correlation. The level of statistical significance was set at α = 0.05.

Results: 7 strong correlations were found between dynamic postural stability parameters and golf swing parameters. Negative correlations were found for the parameters HCP and aADTUP r_s = -0.626; Club speed 7i and aADTDW r = -0.665; Club speed Driver and aADTDW r = -0.802; Mean total deviation in meters and LOS aDCL r = -0.612; Mean total deviation in percent and LOS aDCL r = -0.600. Positive correlation for Club speed 7i and MCT Comp r = 0.508; Club speed Driver and MCT Comp r = 0.781. The relationship between the long-term performance (HCP) parameter and club head speed was found to be statistically insignificant with p = 0.660 for 7 iron and p = 0.613 for Driver. Strong correlations were found between the HCP parameter and the mean total deviation in metres with r = 0.593 and in percentage with r = 0.597.

Conclusion: In this study, the relationship between dynamic postural stability parameters and golf swing parameters was demonstrated. Even though the hypothesis of the thesis was rejected according to the results, several significant relationships were found that could be followed up and investigated in more detail in the future. The results also indicate the importance of training and improving the quality of postural stability, due to better golf performance.