Comparison of Physical and Golf-Specific Performance Profiles Between Strength-Trained and Non-Strength-Trained Male Golfers

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ABSTRACT:

The purpose of this study was to compare the physical and golf-specific performance profiles of male golfers who regularly participated in strength training in addition to golf practice and those who only participated in golf training. A total of 60 male golfers voluntarily participated in the study. Participants were divided into two groups: golfers who regularly performed strength training alongside golf practice (n = 40) and golfers who only participated in golf training (n = 20).

Body composition, maximal strength performance, countermovement jump (CMJ), and golf-specific performance variables including ball speed and club head speed were assessed. Descriptive statistics were calculated for all variables. Independent samples t-tests were used for between-group comparisons, while Pearson correlation analysis was conducted to examine relationships between variables. Statistical significance was accepted at $p < 0.05$.

The findings indicated that the strength-trained group demonstrated higher values in maximal strength variables compared with the golf-only group. In golf-specific performance measures, the strength-trained group showed higher mean values in several variables; however, not all between-group differences reached statistical significance. In addition, body fat percentage was negatively associated with jump performance variables. Positive trends were observed between selected lower-body strength measures and golf performance outcomes, although these relationships were not

consistently significant.
In conclusion, golf performance appears to be influenced not only by technical skill but also by physical performance characteristics. Regular strength training may contribute positively to the physical performance profile of golfers. However, longitudinal and experimental studies are required to establish causal relationships more clearly.

Keywords: golf performance, strength training, maximal strength, ball speed, body composition, physical performance.

1.Introduction

Golf performance is closely associated not only with technical skill, tactical decision-making, and psychological factors, but also with physical capacity. Although traditionally considered a low-intensity and skill-dominant sport, modern golf increasingly emphasizes the role of strength, power, mobility, and neuromuscular control in optimizing performance (Hellström, 2009; Wells et al., 2009). Particularly in elite competition, increasing demands for greater driving distance and competitive consistency have highlighted the importance of physical preparation.

The golf swing is a complex kinetic-chain movement initiated from the lower extremities and transferred sequentially through the pelvis, trunk, and upper extremities. Effective force production and transfer during this movement are considered key determinants of swing efficiency and shot quality. Lower-body strength, trunk stability, and rotational power have been identified as major contributors to club head speed and ball speed (Nesbit & Serrano, 2005; Lephart et al., 2007).

Club head speed and ball speed are among the most important mechanical outcomes in golf performance. Improvements in these variables are directly related to driving distance and may positively influence overall scoring performance. Previous studies have demonstrated significant relationships between vertical jump ability, maximal strength, lower-body explosive power, and golf swing speed (Fletcher & Hartwell, 2004; Doan et al., 2006). Therefore, improving physical performance variables may be beneficial not only for general athleticism but also for golf-specific outcomes.

Strength training is widely recognized as one of the most effective methods for enhancing athletic performance. Regular resistance training has been shown to improve maximal strength, muscular power, speed, balance, and neuromuscular coordination (Brown & Ferrigno, 2019; Tutar et al., 2025). In golfers, strength- and power-based training programs may improve club head speed, ball speed, and driving distance.

Despite growing interest in golf fitness, studies directly comparing golfers who regularly perform structured strength training with those who only participate in golf practice remain limited. Therefore, the aim of the present study was to compare the physical characteristics, strength parameters, and golf-specific performance variables of strength-trained golfers and golf-only golfers.

2. Methods

2.1 Study Design

This study was designed as a cross-sectional investigation. The physical and golf-specific performance profiles of golfers who regularly performed structured strength training in addition to golf practice were compared with those of golfers who only participated in golf training. All measurements were conducted at a single time point, and participants' current performance levels were analyzed. Information regarding golf training frequency, training duration, and training history was collected from all participants. Efforts were made to ensure comparable sporting backgrounds between groups to allow observed differences to be interpreted in relation to strength training participation.

2.2 Participants

A total of 60 male golfers voluntarily participated in the study. Participants were allocated into two groups according to their current training habits: a strength-trained golf group (n = 40) and a golf-only group (n = 20). The strength-trained group consisted of golfers who, in addition to regular golf practice, performed structured resistance training at least two times per week. The golf-only group consisted of golfers who regularly practiced golf but did not participate in any systematic strength training program. Due to the observational nature of the study, participants were not randomized. Group classification was based on self-reported training background and voluntary participation. Although group sizes were unequal, all participants were active golfers of similar age range and regular sporting background.

2.3 Measurement Procedures

Body composition was assessed using the bioelectrical impedance analysis method. Body fat percentage values were recorded for all participants. Maximal strength performance was evaluated using a standard one-repetition maximum (1RM) protocol, with particular emphasis on the barbell squat exercise. Lower-body explosive power was assessed using the countermovement jump (CMJ) test. Participants performed maximal vertical jumps under standardized testing conditions, and the best valid attempt was recorded. Golf-specific performance was evaluated using a portable Doppler radar-based launch monitor system (TrackMan 4, TrackMan A/S, Denmark). This device measures club and ball flight variables in real time with high-frequency tracking technology. Testing was performed under standardized driving conditions. The highest valid trial for each participant was included in the analysis. Ball speed (mph) and club head speed (mph) were recorded as the primary golf performance variables.

2.4 Statistical Analysis

All statistical analyses were conducted using IBM SPSS Statistics software. Descriptive statistics were expressed as mean ± standard deviation (SD). Independent samples t-tests were used to compare variables between the two groups. Pearson correlation analysis was applied to determine relationships between physical performance variables and golf-specific performance measures. Normality of data distribution was evaluated using the Shapiro-Wilk test. Statistical significance was accepted at $p < 0.05$.

3. Results

3.1 Descriptive Characteristics and Group Comparisons

The descriptive values of the participants' physical and performance variables are presented in Table 1. The strength-trained group demonstrated higher mean values in squat strength and ball speed compared with the golf-only group. In contrast, CMJ performance was slightly higher in the golf-only group. Body fat percentage values were relatively similar between groups.

Table 1. Comparison of Physical and Performance Variables Between Groups

Variable	Golf + Strength Training (n=40)	Golf Only (n=20)
Body Fat (%)	19.65	17.88
Squat (kg)	60.88	53.18
CMJ (cm)	30.09	31.85
Ball Speed (mph)	142.11	138.89

The higher squat values observed in the strength-trained group suggest that regular resistance training may contribute positively to maximal strength development. Although the strength-trained group also demonstrated higher ball speed values, not all between-group differences reached statistical significance.

4. Discussion

The purpose of this study was to compare the physical and golf-specific performance characteristics of golfers who regularly performed strength training in addition to golf practice with those who only participated in golf training. The main findings indicated that the strength-trained group demonstrated superior maximal strength values and showed more favorable mean values in several golf-specific performance variables. In addition, body fat percentage was negatively associated with lower-body power performance. These findings support the growing importance of structured physical conditioning in golf athletes (Wells et al., 2009; Hellström, 2009).

Golf has traditionally been viewed as a technical and skill-dominant sport. However, contemporary evidence suggests that golf performance is influenced by a combination of technical efficiency, physical capacity, mobility, neuromuscular control, and psychological consistency (Fradkin et al., 2004; Hume et al., 2005). In modern competitive golf, increasing emphasis on driving distance and repeated performance under pressure has elevated the importance of athletic preparation (Lephart et al., 2007).

The golf swing is a complex kinetic-chain movement initiated from the lower body and transferred sequentially through the trunk and upper extremities. Efficient force production and transfer across these segments are essential for generating club head speed and ball speed (Nesbit & Serrano, 2005; Myers et al., 2008). Therefore, golfers with greater lower-body strength and trunk force-transfer capacity may have a mechanical advantage during the swing.

One of the most important findings of the present study was the superior squat strength observed in the strength-trained group. This result is consistent with previous literature demonstrating that structured resistance training enhances maximal force production, motor unit recruitment, neuromuscular efficiency, and overall athletic performance (Kraemer & Ratamess, 2004; Suchomel et al., 2016). Since golf practice alone may not provide sufficient overload stimulus to maximize strength development, supplementary resistance training appears beneficial.

Ball speed outcomes also deserve attention. Although between-group differences did not consistently reach statistical significance, strength-trained golfers demonstrated higher mean ball speed values. Ball speed is strongly related to carry distance and overall performance potential (Fletcher & Hartwell, 2004). Previous studies have reported that increases in strength and power may positively influence club head speed, ball speed, and driving distance (Doan et al., 2006; West et al., 2011). The present findings are generally consistent with this trend.

Interestingly, CMJ performance did not clearly favor the strength-trained group. This may indicate that maximal strength development does not automatically translate into superior vertical explosive performance. Jump performance is influenced not only by force capacity but also by rate of force development, stretch-shortening cycle efficiency, coordination, tendon stiffness, and movement skill (Cormie et al., 2011; Markovic & Mikulic, 2010).

Another meaningful outcome was the relationship between body composition and performance. Higher body fat percentage was associated with lower jump performance and lower squat values. This supports previous evidence indicating that excess non-functional mass may reduce relative strength, movement efficiency, and explosive output (Ackland et al., 2012; Slimani et al., 2016).

The correlation analysis showed that lower-body strength and jump variables had only weak-to-moderate associations with golf-specific speed outcomes. This suggests that golf performance cannot be explained solely by physical variables. Swing mechanics, timing, contact quality, coordination, experience level, and technical consistency are likely to explain a substantial proportion of golf performance variance (Sell et al., 2007).

From a practical perspective, the findings suggest that golfers may benefit from incorporating structured strength and conditioning strategies alongside technical practice. Programs focusing on lower-body strength, rotational force production, trunk stability, mobility, and movement efficiency may be especially valuable (Thompson et al., 2020).

5. Conclusion

This study compared the physical and golf-specific performance profiles of golfers who regularly performed strength training in addition to golf practice with those who only participated in golf training. The findings indicated that the strength-trained group demonstrated a more favorable profile, particularly in maximal strength variables, and showed higher mean values in selected golf-specific performance measures. Observed relationships between lower-body strength, explosive power, and golf performance variables suggest that golf performance may depend not only on technical skill but also on physical performance characteristics. However, because golf performance is multifactorial, technical ability, coordination, experience level, and swing mechanics must also be considered. The results further indicate that body composition may play an important role in physical performance outcomes, particularly in explosive power and relative strength measures. Lower body fat percentages were associated with more favorable jump and strength performances. Although causal conclusions cannot be drawn due to the cross-sectional design, the present findings support the potential value of physical conditioning in golfers. Structured strength training may contribute positively to the overall athletic profile of golf players. Future longitudinal and intervention-based studies are needed to clarify the direct effects of different training models on golf-specific performance outcomes.

Practical Applications

- Golfers may benefit from integrating structured strength training alongside technical practice.
- Lower-body strength development may contribute to improved force production during the swing.
- Maintaining favorable body composition may support explosive performance.
- Strength and conditioning programs should be individualized according to training age, skill level, and physical needs.

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