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**EXTENDED  
ABSTRACT**

# Improving Swing Performance and Reducing Discomfort With Structured Warm-Ups in Golf

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## I. INTRODUCTION

Despite golf's widespread popularity, amateur players often overlook structured warm-up routines, potentially impairing swing performance and increasing injury risk. Existing studies rarely target amateur golfers or examine the long-term effects of warm-up practices. This study evaluates the biomechanical and preventive value of pre-play warm-ups in improving swing speed and reducing common injuries, aiming to inform evidence-based guidelines for safe and effective amateur golf practice.

## II. METHODS

Eighteen amateur male golfers (ages 18–24, handicaps 18–24) were divided into warm-up and no warm-up groups. The warm-up group performed structured routines including dynamic stretches and golf-specific movements over four weeks. Swing speed was measured using the Trackman System across 20 full swings per participant. Injury risk was assessed via self-reported pain scales, particularly lower back discomfort, before and after swing sessions. Comparative data were analyzed to evaluate performance and injury outcomes.

## III. RESULTS AND DISCUSSION

### A. Impact of Warm-Up on Swing Speed Improvement

The Warm-Up group showed a statistically significant 5.4 mph improvement in average swing speed ( $p < 0.001$ ,  $d = -2.48$ ), highlighting the strong positive impact of structured warm-ups on swing performance. Similarly, [1] highlighted that sport-specific warm-ups improve the neuromuscular readiness required for explosive movements such as the golf swing. This underscores the biomechanical advantages of dynamic, golf-specific movement preparation among amateur players.

TABLE I

SWING PERFORMANCE COMPARISON (WARM-UP VS NO WARM-UP GROUP)

Variable	Group	n	Mean	Median	SD	Shapiro-Wilk W	p-value
Pre Swing Speed (mph)	No Warm-Up	9	80.5	80.3	1.24	0.922	.408
	Warm-Up	9	80.7	81.3	1.42	0.876	.141
Post Swing Speed (mph)	No Warm-Up	9	83.0	84.5	3.80	0.802	.022*
	Warm-Up	9	86.1	87.1	2.35	0.685	<.001**
Before Swing Pain (1–10)	No Warm-Up	9	1.00	1.00	0.00	–	–
	Warm-Up	9	1.00	1.00	0.00	–	–
After Swing Pain (1–10)	No Warm-Up	9	6.89	7.00	1.27	0.948	.663
	Warm-Up	9	1.89	2.00	0.78	0.838	.055

### B. Performance Differences Between Warm-Up and No Warm-Up Groups

The Warm-Up group achieved faster (86.1 mph vs. 83.0 mph) and more consistent swing speeds ( $SD = 2.35$  vs. 3.80), with a statistically significant between-group difference ( $p = 0.022$ ,  $d = -1.22$ ). This supports the findings of [2], who emphasized that structured warm-up protocols improve movement efficiency and reduce performance variability. [3] also observed that athletes engaging in pre-performance routines exhibit greater motor control and consistency. These results confirm that warm-ups enhance not only performance but also the reliability of amateur golfers' swing execution. Additionally, the Warm-Up group reported significantly less post-swing pain (1.89 vs. 6.89), highlighting the protective effect of warm-ups in reducing injury risk. These findings align with previous studies indicating that dynamic, golf-specific warm-ups improve performance [1][4][5].

### C. Practical Warm-Up Recommendations for Amateur Golfers

Dynamic, golf-specific warm-up elements, particularly rotational movements and pre-swing drills, were highly effective and well received. Given their simplicity, short duration, and clear benefits, they are easily integrated into amateur golf routines. These findings support [4], who reported that simple warm-up interventions can lead to measurable performance gains and improved safety. Coaches should standardize such warm-ups to boost both safety and performance.

## IV. CONCLUSIONS

Structured, golf-specific warm-up routines significantly enhance swing speed, and reduce lower back discomfort among amateur golfers. These findings support implementing short, dynamic warm-ups into regular practice to boost performance and safety. Coaches and players alike can benefit from these evidence-based recommendations to optimize training effectiveness.

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#### REFERENCES

- [1] Yeemin, W., Kemarat, S., & Theanthong, A. (2020). The effects of post activation potentiation warm-up and pre-shot routine programs on driving performance in amateur golfers. *PLoS ONE*, 15(10), e0240881. <https://doi.org/10.1371/journal.pone.0240881>.
- [2] Silva, L. M., Neiva, H. P., Marques, M. C., Izquierdo, M., & Marinho, D. A. (2018). Effects of warm-up, post-warm-up, and re-warm-up strategies on explosive efforts in team sports: A systematic review. *Sports Medicine*, 48(10), 2285–2299. <https://doi.org/10.1007/s40279-018-0958-5>.
- [3] Ehlert, A., & Wilson, P. B., & Fradkin, A. J. (2019). A systematic review of golf warm-ups: behaviors, injury, and performance. *Journal of Strength and Conditioning Research*, 33(12), 3444–3462. <https://doi.org/10.1519/JSC.0000000000004786>.
- [4] Fradkin, A. J., Sherman, C. A., & Finch, C. F. (2004). Improving golf performance with a warm up conditioning programme. *British Journal of Sports Medicine*, 38(6), 762–765. <https://doi.org/10.1136/bjism.2003.009399>.
- [5] McCrary, J. M., Ackermann, B. J., & Halaki, M. (2015). A systematic review of the effects of upper body warm-up on performance and injury. *British Journal of Sports Medicine*, 49(14), 935–942. <https://doi.org/10.1136/bjsports-2014-094228>.