

Effects of 360° TitaniUM Core Strength Exercise® on Swing Speed in Novice Golfers

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Abstract

The aim of this study was to examine the effects of 360° titanium core strength exercises ® on novice swing speed. All participants completed before and after use of the PRGR device. Statistical analysis using independent sample t-Tests demonstrated significant effects, with the intervention group showing significantly higher Swing Speed in the post-test compared to the COG (IG post-test: M=78.65, SD=16.37; COG post-test: M=64.00, SD=19.77; $t(38) = 4.504$, $p < 0.05$). There was a significant in Swing Speed between pre (M=60.20, SD=9.87) and post (M=78.65, SD=16.37) in the IG ($t(19) = -7.074$, $p < 0.05$). In contrast, the COG did not show significant differences in Swing Speed (pre: M=43.00, SD=13.10; post: M=46.55, SD=9.29; $t(19) = -1.976$, $p > 0.05$).

Keywords: 360° TitaniUM Core Strength Exercise®, Golf Performance, Swing Speed.

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1.0 Introduction

The growing popularity of golf worldwide, especially in China, highlights the sport's potential to drive cultural exchange and international cooperation, shape perceptions of leisure activities and promote healthy lifestyles. The implementation of these measures and campaigns is in line with a broader national strategy to promote sporting excellence and integrate golf into the fabric of China's sporting landscape, highlighting its role in fostering national pride and international recognition.

With the popularity of golf, people pay more and more attention to the display of core strength in golf technology. Balancing this need with the necessary technical aspects has become an ongoing pursuit for golf enthusiasts and researchers (Weston & Spears, 2013). Golf as a sport and recreational activity has gained significant research interest. The research of core strength training is of great significance. Empirical data show that core strength training can significantly improve technical proficiency and performance during training (Luo, 2022). In the continuous development of golf, the requirements for technology are becoming more and more stringent. Core strength is the soul of technical development, and a single traditional core strength training can no longer meet them. How scientific systems develop our core potential to better improve golf technology becomes our research focus. The purpose of this study was to investigate the performance and function of 12 weeks of 360° titanium core strength training on the core muscles of novice golfers, as well as the relationship between core strength and golf performance.

Table 1. IG and COG the Pre-test and Post-test Paired Samples Test

Group	Pre- test		Post-test	
	Mean	Std. Deviation	Mean	Std. Deviation
IG Swing Speed	60.20	9.87	78.65	16.37
COG Swing Speed	43.00	13.10	46.55	9.29

Table 2. IG and COG the Post-test Independent Samples Test

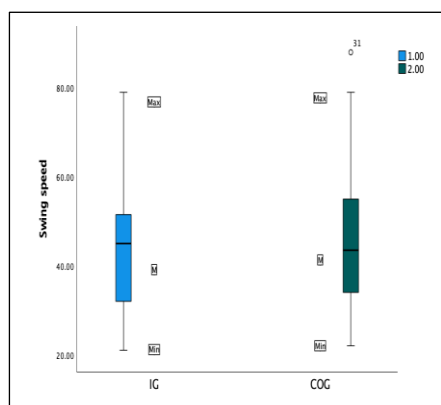
Program	t	df	Post-test		p
			Mean	Std. Deviation	
Swing Speed	4.504	38	60.20	9.87	0.001
	4.504	38	46.55	9.29	0.001

Table 3. Paired Mean and Std. Deviation within pre-post tests

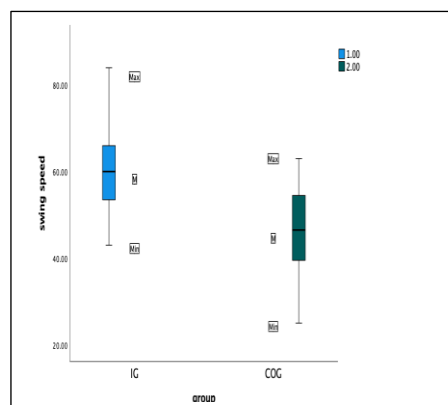
Group	Pre- test		Post-test	
	Mean	Std. Deviation	Mean	Std. Deviation
IG Swing speed	60.20	9.87	78.65	16.37
COG Swing speed	43.00	13.10	46.55	9.29

Table 4. Cohen's d of Swing Speed for Interention Group and Control Group

Swing Speed	Group	Pre-Post	Post-post
		Cohen's d	Cohen's d
	IG	0.89	
	COG	0.23	
	IG&COG		1.395



(a)



(b)

Fig1: (a) Intervention group and Contor group Difference of Pre-test Boxplot Swing Speed:(b) Post-tests of Intervention Group and Control Group Boxplot Swing Speed.



(a)



(b)

Fig 2:Instrumentations PRGR Golf Precision Swing Speed and Driving Distance Rangefinder ($r \geq 0.93$)

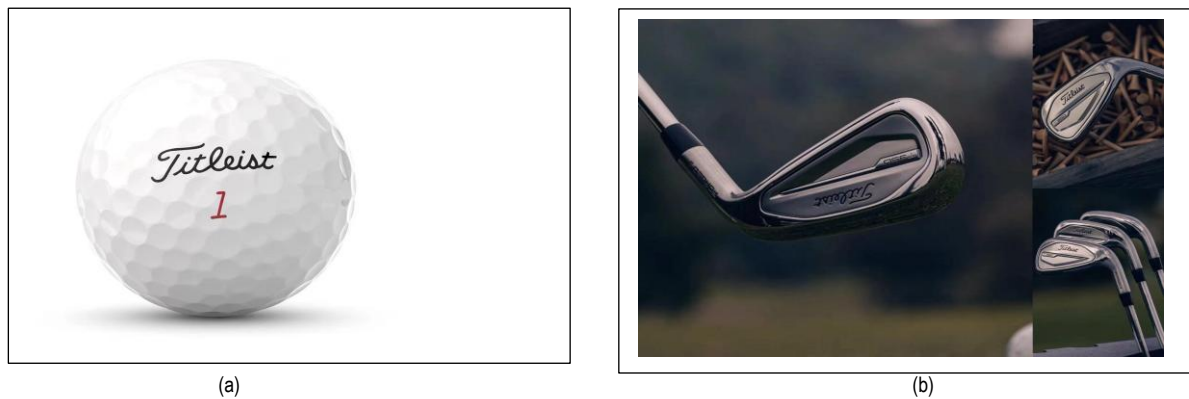


Fig3: Titleist Pro V1and Golf Club Model and Size Data #7

2.0 Literature Review

2.1 By analyzing the effects of Core Strength improvement on swing speed for novice golfers, this study aimed to explore the significant difference in swing speed in 360° TitaniUM Core Strength Exercises®.

The 360° TitaniUM Core Strength Exercises® is a series of innovative exercises designed to strengthen the muscles in the core area. Through a structured exercise sequence, trainers can achieve higher movement efficiency, enhance body control and balance, increase the power output of core and surrounding muscles (such as shoulders, arms, and legs), reduce the risk of injury (core muscles act as shock absorbers in actions like jumping and bouncing), and improve balance and stability (Hooi, 2020).

The literature review shows that the current research mainly focuses on the traditional core strength and golf technology, the difference between the traditional core strength and the modern core strength, and the research emphasizes the unification of the technical field. These findings highlight the importance of the perfect combination of strength training and golf techniques at the heart of science.

2.2 Limitations of the study

a) Narrow range of variables

The study may have focused only on specific variables related to swing speed and stroke distance, potentially ignoring other key factors that could affect these results, such as technological changes, environmental conditions, or psychological factors.

b) Movement is limited by its own characteristics.

c) Control variables

d) Time factor, the time span of the study may be short, unable to capture the long-term effects of core strength training. Swing speed and stroke distance may take longer to improve, and short-term studies may not be able to adequately assess this effect.

3.0 Methodology

3.1 Method

Methods t-Test was used to determine the influence of 360° TitaniUM Core Strength Exercise® training on golf novice's swing speed. The control group and the intervention group were tested before and after intervention, respectively, During the 12-weeks intervention period, the control group continued their normal warm-up exercises and golf training, while the intervention group also continued their normal warm-up exercises and golf training, but with an additional 360° TitaniUM Core Strength Exercise® training for 40 minutes three times per week.

3.2 Participants

A total of 40 male (30) female (10) golfers aged 18-22 years (height : 179.15 ± 7.81 cm weight : 69.18 ± 11.34 kg) were recruited for the study. All participants have obtained the informed consent of all new golfers to participate in the study, and will inform the relevant research attention points, participation content and 360 core strength training methods. The reliability and validity values of the study were ($r \geq 0.93$) indicates that the reliability of the scale is very good, which means that the measurement results of the test or scale have high stability and reliability. The University Ethics Committee gives ethical approval in accordance with the Declaration of Helsinki. Prior to the test, experimental data was collected at the Linyi Golf Academy in Shandong Province, China. Standardized protocols manage tests to keep participants confidential.

3.3 Procedures

Before the test began, all participants underwent standardized testing and routine warm-ups to ensure they were physically prepared and to minimize any potential risks. The warm-up phase lasted 15 minutes and included the following components.

- a) General aerobic exercise (3 minutes) Participants jogged around the course to enhance cardiovascular readiness for strenuous activity and increase muscle blood flow.
- b) Dynamic stretching (6 minutes) A series of dynamic stretching exercises targeting major muscle groups involved in golf, including quadriceps, hamstrings, calves, glutes, shoulders, and wrists. Exercises such as leg swings, arm rotations, shoulder rotations, lunges, and trunk rotations were included to improve flexibility and range of motion without reducing muscle strength.
- c) Sport-specific exercises (6 minutes) Participants performed specific exercises to further prepare their bodies for the demands of golf swing speed and driving distance. These exercises emphasized the importance of speed and efficiency in swing skill.

3.4 Statistical Analysis

SPSS T-test test was used to analyze the data. The paired sample T-test was used to analyze the changes in scores between pre-start data and post-test for the intervention and control groups, respectively. The independent sample t test was used to analyze the changes in the posterior data of the intervention group and the control group. Cohen's d is used to describe the effect sizes of parametric tests, according to the following conventions: small (0.20 to 0.49), medium (0.50 to 0.79), and large (0.80 and above)(Cohen, 1988). Pearson's r is used to describe scale effects for non-parametric tests according to the following conventions: small (0.10 to 0.29), medium (0.30-0.49), and large (0.50 and above) (Cohen, 1988).

4.0 Findings

4.1 Findings

The main objective of this study was to discover the effective effect of 360° Titanium core strength training ® on the swing speed of novice golf players. The results showed that 12 weeks of 360° Titanium core Strength Exercise ®, 3 times/week, 10 seconds to 20 seconds/time of progressive exercise can significantly improve. Thus, the novel development of this new core strength regimen used in this study provides a viable alternative possible technique for strengthening core strength muscles and directly improves the performance of swing speed for novice golf players.

360° Titanium Core Strength Exercises ® consists of 12 isometric exercises, performed sequentially, targeting 29 pairs of core strength muscles. In this case, compared to traditional core strength training, this new core strength training may in theory lead to greater intensity (and potentially higher rates) than other core training, he is more systematic and scientific. This is just a hypothesis, the results of the study showed that the intervention group significantly improved after the test [$t(19) = -7.074$, $p < 0.05$]; Control group after the test [$t(19) = -1.976$, $p > 0.05$]. This result is supported by several previous literature sources, which show that 360° Titanium core strength training ® significantly improves swing speed for novice golfers. Past studies have pointed out that traditional core strength training has been more studied in the past, but the core strength training of scientific systems is rarely used in experimental studies.

The study of golf swing speed can be easily seen in the past research, but the study of the core strength of the scientific system, especially the 360° titanium core strength training ®, is difficult to see in the relevant references, which further explains the significance and value of our research. In addition, the age range of the participants in this study was between 16-22. Since golf is an aristocratic sport, most of the study group are in the middle and old age, and there are relatively few studies on teenagers, which indicates that the research value is higher. The results of this study demonstrate the effectiveness of 360° titanium core strength training ® on the swing speed of novice golfers, confirming the study hypothesis and study purpose. This study provides scientific training methods for the future development of golf, increases the performance of golf competition, and explains the significance and value of the study.

Important research on improving adolescent balance with 360°Titanium Core Strength Exercises® (Hooi et al., 2020) found that within a reasonable timeframe, this exercise significantly enhances adolescent balance through core strength training. Research on the effects of 360°Titanium Core Strength Exercises® on chronic nonspecific low back pain, driving distance, and trunk extensor performance (Lai et al., 2023) indicates that an appropriate dosage of this exercise is an effective core training regimen for managing chronic nonspecific low back pain.

Studies emphasizing the primary role of 360°Titanium Core Strength Exercises® suggest it as a comprehensive and effective training method (Hooi, 2020). 360°Titanium Core Strength Exercises® represents a novel exercise sequence designed to strengthen core muscle regions. Therefore, optimal development of core strength stabilizes the core by enhancing trunk muscle strength and effectively transferring leg energy to the upper limbs (Dung, 2020). Research on 360°Titanium Core Strength Exercises® in hypertension medicine (Hooi & Wah, 2018) explores its application in managing hypertension.

This research illustrates the greater value of our research and fills research gaps. As competition in golf increases, athletes seek to improve driving distance, accuracy, and endurance. 360°Titanium Core Strength Exercises® has proven effective in other sports by enhancing muscle control, balance, and movement efficiency. However, there has been no systematic study on how this training affects swing techniques and driving distance in golf. Filling this research gap could provide golfers with a new training approach that may enhance their performance in competitions.

Studies show that novices have significant potential for improvement in their technique and swing performance. With systematic training and technical guidance, beginners can rapidly enhance their swing skills and tactical awareness, gradually approaching the level of more experienced golfers. For instance, the book "12-Week Progressive Resistance Training Improves Physical Fitness and Swing Performance in Gifted Young Golfers" delves deeper into the importance of studying young novice golfers. This research further clarifies the positive impact of 360°Titanium Core Strength Exercises® Power Training on beginners, providing a more scientific and

solid foundation for the research and development of golf. These findings offer valuable insights for the future development of golf players and contribute to the advancement of golf technology.

5.0 Discussion

5.1 Discussion

This study investigated the effects of a 12-week 360° Titanium Core Strength Exercise ® program on novice golf swing speed. The swing speed of the novice in the intervention group and the control group was measured before and after. The results showed that the intervention group receiving 360° core training was significantly better than the control group in swing speed.

This study investigated the effects of a 12-week 360° Titanium Core Strength Exercise ® program on novice golf swing speed. The significant difference of swing speed between the intervention group and the control group was compared. The results showed that the intervention group had a significant increase in swing speed ($p < 0.001$), the control group was not significant.

These findings highlight the potential of 360° Titanium Core Strength Exercises ® to improve golf performance. The stability provided by this core training is essential for effective power transfer during the swing, thereby increasing the distance of the shot. Therefore, systematic and regular core training can significantly improve the athletic performance of novices, not only improve the consistency and effectiveness of techniques, but also reduce the risk of injury and improve overall fitness. From the practical point of view, this study provides a strong theoretical basis for golf coaches and athletes to pay attention to the training of core strength.

The 360° Titanium Core Strength Exercise ® constitutes a comprehensive core strength training program that targets 29 core muscle groups, including the frontal muscles, the abdominal muscles (rectus abdominis, transversus abdominis, internal and external obliques, and iliopsoas), the back (erector and gluteus maximus), and the deep abdominal muscles (quadratus lumborum and psoas major). The program takes place three times a week for 12 weeks, each lasting about 45 minutes, for a total of 36 sessions. During these sessions, the intervention group performed a series of 12 evenly distributed core strength exercises under the 360° Titanium Core Strength Exercise ® program. These sessions are scheduled on Mondays, Wednesdays and Fridays after the warm-up to maximize the effectiveness of the training.

In contrast, the control group only performed regular warm-up exercises and did not perform specific core strength training. In summary, this training program is designed to enhance the core stability and strength of the players, thereby improving their performance and results in the game of golf.

6.0 Conclusion & Recommendations

6.1 Conclusion

After 12 weeks of 360° Titanium Core Strength Exercise®, there was a significant improvement between the intervention and control groups ($p < 0.001$), the control group was not significant. The results show that the 360° Titanium Core Strength Exercise® significantly improves swing speed for novice golfers.

6.2 Recommendations

Future research could further explore different training regimens and durations to understand their long-term impact on swing technique, maximizing the effectiveness of core training to meet the needs of golfers at different skill levels. In the future research experiments, the number of experimental groups should be increased, different time periods should be increased, and the time stage of the research should be extended. Exercise is a long-term process. Add more sample sizes to make the data more accurate.

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Paper Contribution to Related Field of Study

No

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