

CHAPTER V

CONCLUSIONS

This study focuses on analyzing foot pressure patterns that affect energy flow during the golf swing between professional and amateur golfers, as well as the impact of different types of golf clubs. The findings indicate that professional golfers exhibit a more balanced foot pressure distribution, leading to more efficient energy transfer, while amateur golfers tend to lose energy due to improper weight shifting. The use of different golf clubs also influences weight distribution; using a Driver tends to increase heel pressure, supporting greater energy buildup for powerful swings, whereas a 7-Iron allows for better anterior foot pressure control, enhancing shot accuracy.

The study also found that professional golfers apply higher pressure in the Medial Metatarsal and Lateral Arch areas, which facilitates a smoother energy transfer to the upper body, optimizing power generation. In contrast, amateur golfers tend to exert excessive pressure on the toes and heels, leading to energy loss. Additionally, during different swing phases, professional golfers are more adept at maintaining weight balance, particularly during the backswing and ball impact phases, which contributes to improved energy transfer efficiency and reduced energy dissipation.

Based on these findings, the results can be applied to developing training programs aimed at improving foot pressure distribution and weight shifting efficiency. Moreover, insights from this study could be used in designing golf shoes that enhance foot stability and prevent excessive pressure in critical areas. The development of smart insoles with real-time pressure sensors could also help golfers adjust their swing mechanics more effectively. Additionally, utilizing Motion Capture technology for swing analysis can assist golfers in refining their techniques with greater precision.

Furthermore, the differences in foot pressure patterns between professional and amateur golfers identified in this study provide useful guidelines for defining optimal foot pressure distribution during the golf swing. These insights can be used to develop golf swing analysis applications that compare a user's foot pressure with ideal patterns from professional golfers. This allows the app to provide real-time feedback to help users correct incorrect weight transfer and improve energy transfer during the swing.

In terms of sensor design, the observed relationship between foot pressure and energy flow during each swing phase suggests that smart insole sensors should be strategically positioned. Key areas such as the heel during stance and the forefoot during impact and follow-through are critical for detecting weight shifts. This study also provides guidance on the appropriate number and placement of sensors to effectively capture energy flow, supporting the development of more accurate and personalized swing analysis systems.

However, this study was conducted with a sample group of 30 right-handed golfers, which may limit the generalizability of the findings to left-handed players. Further longitudinal studies are recommended to assess the long-term effects of training interventions on swing mechanics. Additionally, other influencing factors, such as playing surface conditions, footwear design, and fatigue, should be investigated to provide a more comprehensive understanding of foot pressure dynamics in golf.

The findings highlight that professional golfers have superior control over foot pressure, leading to more efficient weight shifting and improved swing performance. In contrast, amateur golfers often show inefficiencies that reduce energy transfer and impact power. These insights can inform the development of personalized training, optimized equipment, and advanced swing analysis tools that measure foot pressure and energy flow accurately. Such applications can help golfers of all levels enhance performance, prevent injuries, and achieve a more efficient and powerful swing.