

Kinesiotaping Versus No Tape on the Agility Performance of Soccer Players in Dumaguete City: A Comparative Study

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ABSTRACT

This paper investigates the gap in current research concerning kinesiology tape in regard to their impact on agility of soccer players who use kinesiology tape on the vastus medialis oblique (VMO) muscle and those who do not. 68 participants were recruited and assigned to two groups: kinesiology tape and no kinesiology tape. Participants were assigned according to their sex, age, and years of experience. The kinesiology tape group had tape applied to both their VMO muscles while the no kinesiology tape group did not. The study employed a descriptive quantitative design. Their agility performance was measured using the Illinois Agility Test. The study found no significant difference ($U = 477.50, p = 0.22$) between the two groups. Therefore, there is no significant difference between the agility of soccer players in Dumaguete City when kinesiology tape is applied on the vastus medialis oblique versus those with no tape when grouped according to sex.

Keywords: Kinesiology Tape, Running Agility, Soccer Players, Agility, Soccer

I. INTRODUCTION

Background of the Study

Soccer is one of the most widely played sports globally. It is getting dubbed as the “World’s Most Popular Sport” with an incredible 3.5 billion fanbase (Kasimov, 2024). Soccer fosters the capacity to develop physical fitness, strategic thinking, and teamwork among players. It is a sport that transcends borders by inspiring communities and fostering youth development in educational settings. Schools, including those in the Philippines, have been instrumental in introducing soccer to young athletes, cultivating their skills, and encouraging active participation in competitive sports. According to Atencio (2024), Tom Byer, a well known soccer player now turned coach, visited the Philippines and advocated for an early soccer education.

Within the world of soccer, athletic performance hinges on various factors, with running agility playing a crucial role. Agility is considered as a vital component due to rapid changes in direction and rapid stopping-and-going (Amarikwa, 2016). These attributes not only enhance a player's ability to navigate the field but also influence their overall play. Several studies have suggested that agility performance may differ between sexes. Pojskic et al. (2018) explored speed strength performance while, Chattanta et al. (2024) directly reported that one gender demonstrated greater agility than the other in their findings.

While this study does not investigate the underlying physiological causes of these differences, it takes into account sex as a demographic factor. This allows for a clearer understanding of whether kinesiology taping affects agility differently in male and female soccer players.

Among these strategies, taping techniques have emerged as a valuable tool. In this study, kinesiology tape is applied to the vastus medialis oblique (VMO), a muscle known for contributing to knee stability during dynamic movements such as running and cutting (Besier et al., 2003). It also functions as a shock absorber during knee flexion and assists in running-related actions (Yeow, 2013). Given its significant role in movements that demand agility, the VMO was selected as the target site to assess whether taping this muscle can influence agility-related performance. These methods are employed to provide musculoskeletal support, minimize the risk of strains or sprains, and potentially enhance athletic ability (Petersen, 2024). Its usage is increasing among athletes at major sporting events like the Olympics. KT gained widespread attention after the 2008 Olympic Games, where it attracted media interest due to its colorful, multi-hued designs worn by numerous athletes and since then has become commonplace among athletes across various sports and has also extended to recreational athletes and the general public (Dehghan et al., 2024).

While taping is widely practiced, particularly in school-level, its benefits remain a subject of debate. This research aims to offer a clearer understanding of how such interventions can influence running agility and, ultimately, the success of soccer players. The key variables investigated in this study include the presence or absence of kinesiology tape, the sex of the athlete, the target muscle for taping (vastus medialis oblique), and their agility performance. By comparing these taping conditions, it intends to contribute to evidence-based strategies for athletes in soccer.

Statement of the Problem

This study addressed the technical problem of inconsistencies in kinesiology taping and the limited literature on its impact, particularly on agility and its application in soccer players. It discusses a detailed comparison on the running agility of soccer players with kinesiology tape on the vastus medialis oblique muscle versus those with no tape applied. Specifically, the study aimed to address the following questions:

Research Questions

1. What is the agility performance of male and female soccer in Dumaguete City when kinesiology tape is applied on the vastus medialis oblique muscle?
2. What is the agility performance of male and female soccer players in Dumaguete City when no tape is applied on the vastus medialis oblique muscle?
3. Is there a significant difference between the agility performance of male and female soccer players in Dumaguete City when kinesiology tape is applied on the vastus medialis oblique muscle versus those with no tape?

Hypotheses

H0: There is no significant difference between the agility of soccer players in Dumaguete City when kinesiology tape is applied on the vastus medialis oblique muscle versus those with no tape when grouped according to sex.

Significance of the Study

This study is relevant to the following stakeholders:

Soccer players: Soccer players are the primary subjects of this research as they are the ones who will be used in the study. This study will help to educate soccer players to make informed decisions whether to use kinesiology tape in their training sessions or games.

Coaches: This study will be beneficial to coaches as an aid to them in developing training regimens to incorporate kinesiology tape if necessary. It will inform them of taping and where to apply it which will give them the insight for implementing in their training agility.

Physical Therapists: This research will provide them with data that will help them in understanding how they can incorporate the agility benefits of kinesiology tape and in assisting them in improving their athlete rehabilitation strategies. They could have the insight on if the vastus medius oblique muscle is the good a location to incorporate KT into rehabilitation programs to support the recovery necessary for agile movement.

Future Researchers: This study will be beneficial to future researchers as a framework to further explore the implications of the applications of kinesiology tape on the vastus medius oblique muscle for running agility. Through the results of this research, future researchers are able to build on existing literature of the uses of the aforementioned tape to be used in both clinical and recreational settings. The study's findings will offer insights into its role in athletic performance.

Scope and Limitation of the Study

This study focused on the comparison of the running agility of soccer players when applying kinesiology tape and without. Particularly, it centered on the tape being applied on the vastus medialis oblique muscle and will not involve other performance outcomes of soccer players. Only healthy trained players were included in the study thus, kinesiology taping's therapeutic aspect was not considered. Likewise, this research did not take into account the players' positions in the sport nor did it take into consideration consistency in training as an adjunct to their years of experience. The study did not measure the subjective aspect of the kinesiology tape like the players' comfort or pain.

Operational Definition of Terms

Agility. In this study, it is used interchangeably with running agility. It is a person's capability to rapidly adjust their direction and position (Quinn, 2020). It is the dependent variable of the study. In this study, the Illinois Agility test is the research instrument that will be used to measure the agility times using a stopwatch. This study will only compare the agility score of the group without tape and the group with tape using mean, standard deviation, Mann-Whitney U, and p-values.

Agility Performance. This is the purpose of providing an overall indicator of a player's ability to sprint and change direction quickly, therefore the results from such evaluations should be used in conjunction with data from a single run (Academy, 2015). In this study, the researchers used a regression analysis to determine the agility performance of each group using previous studies. In line with this, agility performance can be classified into poor, fair, average, good and excellent.

Football. This sport in Great Britain is synonymous with the sport Soccer in the United States (Cunningham, 2023).

Sex. In this study, sex refers to the biological classification of the participants as either male or female (Zambon, 2021), as self-reported in the demographic data collection. It is used as a variable to compare potential differences in agility performance.

Soccer. It is a sport wherein a round ball is kicked toward the goal without the use of the upper extremities (Joy & Weil, 2024).

Kinesiology Tape. It is a lightweight, elastic adhesive designed to support muscle movement and improve athletic performance, commonly used to alleviate pain, minimize swelling and inflammation, and stabilize joints and muscles (Castro, 2023). In this study, its usage or non-usage is the independent variable. The

taping technique used was a Y strip application to facilitate the vastus medialis oblique. Light to moderate tension, 15% to 35% stretch, is used for facilitation. (Kase et al., 2013).

Vastus Medialis Oblique. In this study, the vastus medialis oblique (VMO) was where the kinesiology tape was applied. It was the specific site for kinesiology taping due to its role in knee stabilization, shock absorption, and contribution to dynamic movements like running and cutting (Besier et al., 2003; Yeow, 2013).

Y Strip Tape Technique. This is the type of taping technique that was used in the study. The taping technique followed the recommendations from Kase et al. (2013). In this study, two members of the research group were certified to perform the taping procedure. It was measured to the appropriate length of the kinesiology tape from the origin of the vastus medialis oblique (VMO) to its insertion at the medial patella. The tape was cut with rounded edges and a split, leaving a 2-inch section uncut. The tape was applied onto the skin, the anchor just above the VMO origin with no tension. Light to moderate tension (15%-35%) was applied to the tails of the tape around the muscle's edges, repeating the process for the upper fibers of the VMO. Finally, the ends of the tape were smoothed down with no tension (adapted from Kase et al., 2013). This application was done for both legs.

II. REVIEW OF RELATED LITERATURE AND STUDIES

Related Literature

Soccer

Soccer is a sport that requires strong aerobic and anaerobic endurance combined with physical fitness, such as agility, speed, and the capacity to sprint repeatedly (Naser et al., 2017). It is also widely celebrated as a sport that unites individuals across diverse backgrounds. According to Borg (2023), soccer is considered a universal language because it transcends cultural and geographic boundaries, fostering connections among people worldwide. It also serves as a powerful tool for promoting socioeconomic development, unity, and social cohesion by bringing diverse communities together. Its universal appeal lies in its ability to foster a sense of community and shared passion, making it a central part of cultures worldwide. In an article, some children in Dumaguete City are being encouraged to play as early as the age of 3, with around 60-70 children that signed up for a soccer program "Football starts at home" with the objective of making them future professional athletes (Partlow, 2024). This program fosters both physical talents and important life values, reflecting a larger commitment to student development via athletics.

According to an article by Cunningham (2023), to differentiate between soccer and football, the term football originated back in 1863 when England's newly formed Football Association wrote down a set of rules. The term would become shorter as students at the University of Oxford in the 1880s would describe "rugger" in rugby football and in football in the association of football as "soccer". The sport would emerge in the United States in the late 19th century and would adopt the term soccer. The terms are synonymous with each other since they are used differently in other cultures. This study adopted the term soccer to maintain clarity and consistency.

There are numerous attributes needed in becoming a professional soccer player with a good set of skills. According to an article, English football players need physical, technical, tactical, and psychological attributes which are developed through dedicated practice and adaptability, which then distinguish successful players in the highly competitive football world (Cox, 2015). Given the rapid direction changes and quick movements needed in modern soccer, players must be more nimble than ever before. Effective

soccer agility exercises like plyometrics, acceleration and deceleration shuttles, and agility ladder drills integrate strength, power, balance, and coordination, allowing players to quickly modify their shooting power and balance to hit the ball with accuracy (Katz, 2024). During a soccer match players need to have good performance, it requires the integration of speed and agility soccer techniques and skills like quality of movement and ball control (Teodor, 2018). There is a high physical demand when it comes to playing soccer according to Dolci et al. (2020). Soccer involves a high-intensity, intermittent pattern of activity that demands both aerobic and anaerobic energy systems. Players cover significant distances (8–12 kilometers per game) while frequently engaging in explosive actions like sprints and jumps, interspersed with lower-intensity recovery periods. The sport requires a combination of endurance, strength, speed, agility, and power, all integrated with technical and tactical skills. Conditioning programs tailored to match-specific demands are essential for optimizing players' physical and energetic performance. In conclusion, out of all the studies mentioned, agility consistently emerges as a fundamental component of soccer performance. This agility relies heavily on the strength and functionality of key muscle groups, particularly the quadriceps; among them, the vastus medialis oblique plays a crucial role in providing the power necessary for dynamic movement during running. Similarly, a study conducted by Camic et al. (2015) concluded that the activation of the quadriceps in relation to the hamstring muscles are similar at moderate levels of running intensity while at higher intensity the quadriceps showed higher activation than the bicep femoris muscle. Another study by Besier et al. (2003) investigated muscle activation patterns around the knee during running and cutting maneuvers, focusing on preplanned (PP) and unanticipated (UN) tasks. Results indicated that during PP tasks, selective activation of medial and lateral muscles occurred to stabilize the knee against specific external loads, such as valgus moments. In contrast, during UN tasks, a generalized co-contraction strategy was employed, resulting in a 10-20% increase in net muscle activation without targeted responses to the increased varus/valgus and internal/external rotation moments, which could be up to 100% greater than those experienced in PP conditions. In short, the study emphasizes the critical role of the vastus medialis oblique (VMO) in knee stability during dynamic movements such as running and cutting.

In a study conducted by Yeow (2013), the aim of their study is to explore the energy dissipation of the lower extremity on the quadriceps and hamstrings, which includes the performance of the vastus medialis oblique (VMO). As the knee flexes, the vastus medialis oblique is one of the muscles that can absorb shock, and it also generate and dissipate energy during the stance, swing and flight phases of running. The study discusses the importance of these knee joints energetics, which is necessary for the proper execution and stance, swing and flight phases during running. The study is relevant in the context of soccer because this demonstrates the running mechanics and energy management.

Running Agility

Agility, particularly in the context of running, refers to the ability to make rapid whole-body movements that involve changes in velocity or direction in response to external stimuli (Sheppard, 2007). It involves not only physical capabilities but also cognitive functions such as visual processing, timing, and anticipation, distinguishing it from mere change of direction speed, which is typically executed in pre-planned scenarios without reactive elements. For instance, they require an athlete to finish a predetermined course of directional changes as fast as possible especially in sports like soccer.

Soccer as a sport does a lot of running on the field. Players have different positions that they need to fill and depending on their position their running intensity will vary. In a study done by Rhini et al. (2024), they have stated that compared to the other positions, the center-forwards ran with the highest intensity,

followed by attacking central midfielders and full backs. There are studies that have shown that agility performance in soccer players can be significantly influenced by targeted training methods. A study by Pojskic et al. (2018) has emphasized the importance that soccer requires a change-of-direction ability, but also well-developed perceptual and decision-making skills evidenced by superior anticipatory motor performance, and a reactive ability where a player can quickly react to external stimuli. For instance, Jovanovic et al. (2011) demonstrated that Speed, Agility, and Quickness (SAQ) training enhances players' explosive power and agility. The study highlighted improvements in directional changes and acceleration, which are key components of running agility in soccer. Building on the evidence of agility's importance in soccer performance, it is essential to evaluate and measure this skill accurately. Expanding on this, Kinesio taping has been explored as a potential method to enhance change of direction and agility performance, providing a practical application for athletes aiming to enhance their agility and coordination during dynamic sports activities.

While agility is essential in sports like soccer, where athletes are required to make quick directional changes, its development can vary significantly across different age groups. This variation becomes evident when examining how agility performance changes with age. For example, a study conducted by Zemková & Hamar (2014) on soccer players highlighted notable differences in agility between younger and older age groups. Specifically, players aged 14 to 15 exhibited significant performance differences compared to those aged 18 to 19, with a statistical significance of $p < 0.05$. These findings suggest that agility improves with age, particularly during the critical 14–18-year maturation period, underscoring the importance of considering age when evaluating athletic performance.

Agility in Terms of Sex

Understanding the factors that influence agility in young athletes is essential for developing effective training programs. Among these factors, age and sex play significant roles in shaping agility performance. A study by Pojskic et al. (2018) highlights not only how age but also sex impact agility in young athletes by examining their effects on speed-strength performance. The participants had sufficient experience with 5 years of experience training and are healthy to be performing the study. The study shows that age has a big influence on males' performance indicators, with adolescence showing the biggest gains. On the other hand, girls' variations in speed-strength performance as they grew older were less noticeable. This implies that, in comparison to girls, guys may acquire power and speed more quickly, which might improve their agility. Given that various genders may require different training methods to maximize athletic performance, the results highlight the significance of taking age and sex into account when creating agility-enhancing training plans.

A study conducted by Chattanta et al. (2024), discusses about the agility performance between male and female soccer players. The aim of the study was to quantify the running agility between male and females. The study included 69 males and 69 female soccer players, aged 18-25. Their agility was collected with the Illinois and agility T-test. The study concluded that the females are statistically and clinically less agile than the males. The study is significant because it demonstrates which gender has more agility.

There have been studies that have indicated that the Illinois agility test is an outcome measure used for running agility. In a study by Hachana et al. (2013) aimed to evaluate the reliability and criterion-related validity of the Illinois Agility Test (IAGT) among male team sport athletes, as well as to explore its relationship with power and speed. A sample of 105 athletes participated, with repeat measurements taken from 89 subjects to assess test-retest reliability and minimal detectable change (MDC). The results indicated an excellent intra-class correlation coefficient (ICC) of 0.96 (95% CI, 0.85-0.98), confirming

the test's reliability. The standard error of measurement (SEM) was recorded at 0.19 seconds, and the minimal detectable change (MDC95) was found to be 0.52 seconds, with a smallest worthwhile change (SWC) of 0.20 seconds, further supporting the reliability of the IAGT. Regarding validity, the study evaluated criterion-related validity through correlations with the T-test, revealing a significant correlation of $r = 0.31$ (95% CI, 0.24-0.39; $p < 0.05$). While no association was found between acceleration and IAGT performance, significant correlations were noted with leg power ($r = -0.39$) and speed ($r = 0.42$). Importantly, when controlling for speed, the relationship between IAGT and leg power diminished. In conclusion, the Illinois Agility Test is a reliable and valid measure of agility in male team sport athletes, primarily related to speed rather than acceleration or leg power, highlighting its relevance in sports performance assessment.

In another study by Kutlu et al. (2017) discusses the reliability on the Illinois Agility Run test in female soccer players. The study mentioned that IAR will be following established methods of the IAT, which indicated, that they will be following the usual guidelines. The results for IAR had an Intra-Class Correlation (ICC) of $r = 0.98$, which indicated an excellent reliability and confirms the tests reproducibility. To support these findings, the study has also stated that the typical errors (TE) were small and was indicated to be a good reliability and the study concluded that the test is reliable in assessing the agility and skill capacity of the female soccer players.

Kinesiology Taping

Kinesiology tape is a thin, elastic therapeutic tape developed by Dr. Kenzo Kase in 1979, commonly used to treat sports injuries and improve athletic performance (Petersen, 2024). In theory, the tape works by applying it to the skin which in turn activates an afferent pathway to the central nervous system (Campolo et al., 2013). According to Williams et al. (2012), after applying it to the skin, using gate control theory, the body reacts by improving pain modulation, enhanced feedback in proprioception, and regulates blood flow through the sympathetic nervous system to activate. It has been used in a variety of ways because of its benefits such as injury prevention and performance enhancement. Due to the numerous benefits, such as enhanced blood flow, muscle and joint stabilization without restricting mobility, reducing pain and inflammation (Bicici et al., 2012), and improved biomechanics during sports competitions, it has become valuable, especially to athletes involved in running and mobility (Hongetal., 2016). Despite its mentioned benefits, Kinesiology tape (KT) also has its disadvantages. This includes having the possibility of skin irritation when applied and lack of knowledge in proper application of KT (Lim & Tay, 2015), can be expensive if used for a long period of time, and inconsistent body of evidence to prove its effectiveness (Wang et al., 2018). In conclusion, while KT can be a useful tool for athletes, its use should be approached cautiously, considering both its advantages and limitations.

In terms of sports performance particularly soccer, there have been studies that demonstrate positive results on the functional performance of soccer players, highlighting the potential of KT as a supportive tool in enhancing athletic abilities. Building on this, a study by Haksever et al. (2012) investigated the effects of KT on the static and dynamic balance of soccer players. The participants will be assessed with a modified star excursion test, Y balance test, flamingo balance test and one leg hops before starting the match, and KT will be applied after 30 mins of their match. In their conclusion, they mentioned that the static and dynamic balance of their players deteriorated at the end of the game. However, they found positive effects on KT on balance and concluded that KT might be used to enhance balance and reduce fatigue. Additionally, it gave the player more confidence during the match. Another study by Espí-López et al. (2019) showed that the football players' knee and lower extremities function and balance are not

improved by KT alone. However, it has notable advantages for enhancing postural control when paired with balancing activities. This implies that when combined with other therapies, KT may have a beneficial role in training or rehabilitation.

KT Effects on Soccer

In the context of soccer, the quadriceps are one of the muscles used in running. Choi and Lee (2018) studied whether the direction of kinesiology tape (KT) application will affect the strength of the quadriceps muscle. They found an increase in quadriceps strength after KT application. This proves that KT can improve muscle performance effectively. In addition, they found that regardless of the direction of application, there were benefits as long as the KT was properly placed over the primary quadriceps muscles.

A study conducted by Cochrane et al. (2023) examined the effects of kinesiology tape in running speed, agility and plyometric performance in amateur soccer players. These soccer players participating are healthy and are around the 18-35 age range. The tape was applied to the vastus medialis oblique (VMO) and gluteus medius. To test for running agility, the Modified Illinois Change of Direction Test was utilized by setting up cones as markers and were to be measured by three timekeepers. The study concluded that there was a significant influence on the running speed, agility and plyometric performance of soccer players after application of kinesiology tape. Another study on improving muscle performance of the quadriceps was conducted by Ahn et al. (2015) explored the immediate effects of kinesiology tape on the motor performance of the quadriceps after muscle fatigue induction, where they recruited 45 healthy female subjects. They made sure to make them do exhort exercises to fatigue the quadriceps and performed peak torque test, one-leg single hop test, active joint position sense test, and one-leg static balance test. They concluded that kinesiology tape can restore the quadriceps muscle power after fatigue. This proves that kinesiology tape can enhance performance of the quadriceps.

Expanding on its performance benefits in soccer, a study by Abellán-Reina et al. (2021) explored the effects of KT on soccer players, specifically examining its impact on countermovement jumping and sprinting performance, providing further evidence of its application in soccer training and competition. The study did a preliminary session by doing a 30-minute warm-up, after the session the KT is applied. The study conducted tests for counter jump tests, where they will be performing vertical jumping and sprint tests where the participants will be sprinting 20 meters. The study concluded KT has increased the sprint execution immediately after application. The study can help educate players on its use. A similar study conducted by Hanayoğlu and Can (2023), evaluated the speed, agility and flexibility of the quadriceps and gastrocnemius on soccer referees. The study collected the agility data by utilizing a T-test protocol, where the athletes were instructed to move in 4 contact points. The study concluded that the application of kinesiology tape to quadriceps and gastrocnemius muscles with 25-50% tension for 48 hours is effective in improving the agility performance. This study can help educate both soccer players and referees on the use of kinesiology tape.

Despite the numerous alleged studies that show the benefits of KT, the current body of literature remains inconsistent regarding its effects on agility. For instance, a randomized controlled crossover trial conducted by Annino et al. (2022) investigated the acute effects of KT applied to the quadriceps and hamstring muscles. The results revealed no significant improvements on running, jumping, or flexibility tests when compared to a no-tape condition, suggesting that KT does not yield immediate enhancements in functional performance. Another study by Alrawaili (2019), investigated the effects of Kinesio Taping (KT) on the thigh muscles of healthy, non-injured soccer players, focusing on muscle groups essential to

soccer performance. The study found no significant improvement or reduction in muscle strength or endurance following KT application, suggesting that KT may not be effective in enhancing muscular performance in uninjured athletes. Supporting this, Solomon et al. (2013) applied KT to eight female athletes and evaluated their agility performance before and after the intervention. Similar to Alrawaili's findings, the results showed no difference in performance with or without the tape. Together, these studies indicate that KT does not significantly influence functional performance outcome such as strength, endurance, or agility in healthy, uninjured athletes, calling into question its effectiveness as a performance-enhancing intervention in this population.

Related Studies

KT in Sports and Rehab

There are studies that demonstrate that KT can enhance agility and range of motion, suggesting its potential as a valuable tool for improving athletic performance during running and other dynamic sports. One of them is a study by Mostaghim et al. (2016) which reported that KT application improved maximal voluntary isometric contraction (MVIC), vertical jump height, agility, and sprint speed in healthy athletes, especially when KT was worn continuously for 24 hours. Another study by Biz et al. (2022) also found that KT, especially when combined with exercises, effectively improved ankle function, stability, and performance in athletes with chronic ankle instability (CAI). The precise timing of the KT application to the ankle was not determined, however the improvements were noted in the gait functions such as velocity, stride length, and the reduced base of support during the movement, reduced range of motion (ROM) in inversion-eversion and also a reduced postural sway in the mid-lateral direction during the movement therefore these findings suggest that there are benefits to KT for athletes with CAI. A similar study was also conducted by Eom et al. (2014) investigated the effects of ankle KT on range of motion and agility during exercise among university students. The findings revealed that the taped group exhibited significant improvements in both dorsiflexion and plantarflexion range of motion compared to the control group. Additionally, agility assessments indicated enhanced performance in agility tasks for the taping group. Building on these findings, another study by Kargin & Çimen Polat (2024) focused on younger athletes, exploring the acute effects of KT on balance, agility, and jumping performance in tennis players aged 8–12. Using muscle techniques, KT was applied to the peroneal muscles, and assessments included the Star Excursion Balance Test (SEBT), T-Agility Test (TAT), and Vertical Jump Test (VJT). Results indicated significant improvements in all performance metrics with KT compared to without. This suggests that KT enhances dynamic balance, agility, and jump performance in young athletes, supporting its use in training or competition for performance improvement in sports requiring rapid directional changes and coordination.

Gaps in the Literature

When compared to other interventions, the results of KT are often not clinically significant, despite several systematic reviews demonstrating that it can enhance function (Mackay et al., 2020). For instance, a study by Baştürk et al. (2015) explored the impact of KT on soccer players' performance, including vertical jumps, agility, and hopping tests. Results indicated no significant performance changes with or without the tape, suggesting that while KT does not enhance the functional abilities, it also does not inhibit them. These findings align with prior studies that show mixed results, emphasizing the need for further exploration of KT's effects on different muscle groups and athletic activities in terms of measuring the running agility of soccer players. Based on our previous literature, there are studies that utilize other agility

tests in measuring running agility but have not included IAT as a tool for measuring agility. Ucan (2020) mentioned that there have been previous studies that stated the Illinois agility test, T - test and 505 agility tests can be used for soccer players to evaluate the agility of soccer players and are widely used tests. The literature on KT reveals inconsistent findings regarding their efficacy, particularly in running agility. According to the systematic review by Reneker et al. (2018), PEDro scores ranging from 3 to 8 out of 10, 15 studies satisfied the inclusion requirements. The study tested all performance skills, and this included running agility. From the 11 studies that they compared, they found that KT has only 2 significant effects. The study concluded that there is a lack of compelling evidence of KT on the enhancement of sports performance. Future studies should aim to address these gaps in research by providing clear evidence to support or disprove KT on running agility.

Theoretical Framework

Proprioceptive Feedback Theory

The proprioceptive feedback theory describes how the body's awareness of its position and movement affects motor control and athletic abilities. Receptors in the muscles, tendons, and joints communicate with the brain to provide continuous information about body posture and motion. This process aids in maintaining correct movement patterns, improving efficiency, and minimizing the chance of injury (Lephart et.al., 1997).

Proprioceptive Feedback Theory and Taping

The proprioceptive feedback theory can be closely linked to the use of taping techniques in running due to their enhancement of proprioception via the provision of sensory input that aids runners in movement adjustment and maintenance of proper body mechanics. When kinesiology tape is applied, it produces a subtle tension on the skin, which activates these receptors and enhances proprioception. For athletes, this enhanced feedback can contribute to more efficient running form, less muscle fatigue, and overall improved performance.

Enhancement of proprioceptive feedback is directly linked to better joint position sense and muscle tension. Muscle spindles detect changes in muscle length and the rate of stretch, providing information on body positioning and movement dynamics during running. In the same way, Golgi tendon organs sense muscle tension via signals when a muscle is exerting too much force, allowing for adjustments in effort during running activities. Additionally, joint receptors in the body's joint capsules provide joint angles and positions for maintaining stability and balance while running.

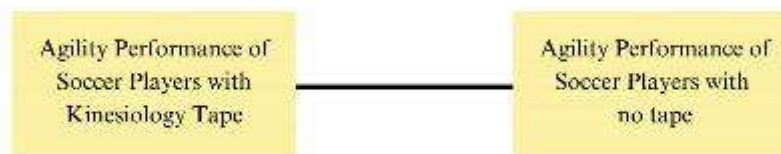
The central nervous system integrates proprioceptive feedback with visual and vestibular inputs to create a comprehensive analysis and awareness of the body position relative to its environment. This is especially important when navigating different terrains during running activities. This integration is also essential for effective motor control via negative feedback loops. When a discrepancy between planned and actual movements occurs, signals are sent to adjust muscle activity accordingly to maintain balance and coordination. In the same way, it also regulates motor commands by error correction in real-time. For example, if an athlete's foot lands in an awkward position, proprioceptors provide immediate feedback that triggers the adjustments needed to stabilize the body.

Conceptual Framework

The conceptual framework of this study illustrates the comparison between the agility of soccer players in Dumaguete City with kinesiology tape and without tape. The framework highlights a comparative design where the agility performance of players using kinesiology tape is measured against those who do not use

it. The study categorizes participants into two groups: (1) soccer players with kinesiology tape applied and (2) those without tape, with the latter group serving as a baseline for comparison. This design allows the study to determine if there is a significant difference between these two taping conditions in terms of agility.

Figure 1
Conceptual Framework



III. METHODOLOGY

Research Design

To address the objectives and questions posed in this study, a quasi-experimental descriptive comparative research design was used. A quasi-experimental research design is to establish a cause and effect between an independent and dependent variable without using random assignment of participants to groups (Thomas, 2020). This design aligns with this research because the participants are assigned to either kinesiology tape or no tape group based on their pre-existing characteristics such as sex, age and years of experience. Descriptive comparative research evaluates two unaltered variables and establishes a systematic procedure to determine which is better (Longe, 2020). A descriptive research design is an approach for investigating the description of a population, situation, or phenomenon. It can assist in answering inquiries about what, where, when, and how, but not why. This design is suitable for this research as it sought to identify the agility of soccer players when kinesiology tape and no tape is applied on the vastus medialis oblique muscle. Meanwhile, a comparative study is a systematic approach that investigates to analyze and evaluate a phenomenon and/or facts among different areas and/or subjects. It involves examining the similarities and differences between the different groups involved in the study (Coccia & Benati, 2018). This design fit the study because we aimed to find out if there is a significant difference between the agility of soccer players when kinesiology tape is applied on the vastus medialis oblique muscle versus when no tape is applied at all.

Research Environment

The study was conducted at the Rusi Ballfield located within Dumaguete City, Negros Oriental. The study was conducted on seven separate days, with data gathering starting in the afternoon including the preparation time for the researchers to set up the IAT. The weather during the data gathering was sunny with light winds on all seven days. This setup provided a controlled and familiar environment for participants, facilitating reliable data collection while aligning with the study's objective of examining the relationship between agility and specific interventions. In line with this, participants wore their regular training shoes and wore any sports attire they found comfortable.

Research Participants

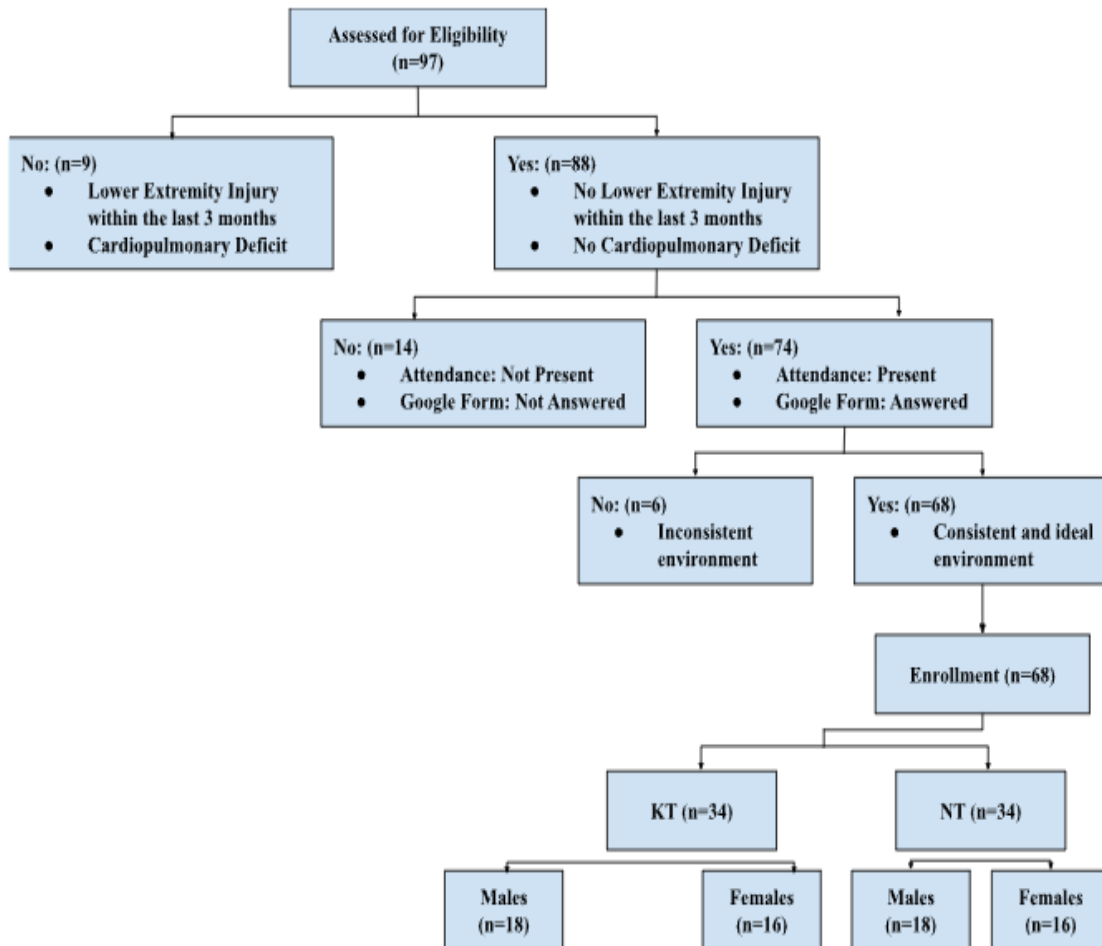
The participants for this study included male and female soccer players who participated in tournaments in the past year in Dumaguete City. The players were chosen in terms of their associated local clubs,

varsity teams, and city leagues that regularly undergo training and formal competitions. The inclusion criteria for participation in the study involved a completion of a minimum of one year of experience in competitive play. In order to ensure safety, the participants were given a google form and informed consent with questions including their history of musculoskeletal injuries for the past three months, and if there are any cardiopulmonary deficits. These requirements were put in place in an attempt to confirm that all participants were physically stable and thus ensuring their safety to participate in the research procedures.

Sampling Procedure

This study employed purposive sampling. Purposive sampling is a non probability sampling technique where participants are selected based on specific characteristics relevant to the research objectives. In this study, participants were chosen based on the inclusion criteria of being soccer players. However, they were excluded if they had any injuries in the past 3 months, cardiopulmonary deficits, or were unable to perform the test correctly despite instructions. Purposive sampling was used to ensure that the selected participants aligned with the study's purpose, allowing for targeted recruitment of individuals who could provide meaningful data. A google form (see Appendix A) was used to collect their sex, age, and years of experience. The researchers filtered out who were eligible. The researchers initially contacted the Negros Oriental-Siquijor Regional Football Association (NOSIRFA), the head of all the football associations as well as clubs in the region. With the assistance of NOSIRFA, the researchers contacted various club coaches who provided them with a list of 91 players under them. These coaches then distributed the google forms to the players. Additionally, the researchers approached 6 additional people that fit the inclusion criteria of the study. This mixed recruitment process yielded a total of 97 potential participants who were assessed for eligibility. From these 97 potential participants, 88 were selected since they did not have any lower extremity injury within the last 3 months and cardiopulmonary deficit while 9 were excluded from the study because they had one or both lower extremity injuries and/or cardiopulmonary deficits. There were 14 potential participants who were not in attendance during the data gathering proper, leaving 74 participants who underwent the data gathering procedure. Six were excluded due to the inconsistent environment, leaving 68 participants as this study's sample size. The 68 participants were divided equally into KT and NT groups who had 34 participants each with 18 males and 16 females for each taping group. A minimum of 30 participants was targeted in this study to ensure reliable estimation of central tendency measures, as sample sizes of 30 or more generally provide more stable means and reduce the influence of outliers (Gravetter & Wallnau, 2017).

Figure 2
Sampling Procedure and Allocation of Participants



This study adopted a descriptive-comparative quasi-experimental design using purposive sampling, a method commonly applied to recent peer-reviewed research. For instance, Lai et al. (2022) conducted a study with the same design comparing well-being outcomes in older adults using two independent groups with only a sample of 36 participants comprising an intervention (n=22) and control group (n=14). Despite the smaller size and absence of randomization, the study successfully detected significant between-group differences. The same goes for Leigh & Kim (2024) who evaluated a lifestyle redesign program among university students using a quasi-experimental comparative design with 33 participants. Both studies demonstrate that meaningful group differences can be observed in quasi experimental settings when effect sizes are moderate, even with samples below 40.

This study, having 34 participants per group (N = 68), exceeds their sample and aligns with standards for detecting medium effect sizes using independent sample t-tests (Cohen, 1988).

In comparison, this study includes 68 participants (34 each group), a notably larger sample. This aligns with recommended thresholds for detecting moderate effect sizes in independent group comparisons (Cohen, 1988). While this study employed a non-parametric test (Mann-Whitney U test) instead of an independent t-test like the studies mentioned, the current study's sample size (N=68) remains statistically acceptable. According to previous quasi-experimental comparative studies with smaller samples, valid

differences can still be identified when effect sizes are moderate. The utilization of Mann-Whitney U test allows the researchers to detect real group differences without random sampling or pre/post-tests, mirroring real-world data which often violates normality. However, unlike Lai et al. (2022) And An and Kim (2024) which accounted for specific participant characteristics relevant to their outcomes (e.g. age in older adults, university lifestyle factors), this study only considered sex, age, and years of experience. It does not account for other potentially influential variables such as baseline agility levels, motivation, body mass index, etc. This omission may limit the internal validity of the findings and restrict the generalizability to broader athletic populations.

Participants were first grouped according to sex and then grouped into blocks according to their age and years of experience. In an attempt to achieve a normal distribution between both males and females, participants were allocated evenly into KT and NT groups. If a block has an odd number of participants, they were assigned to maximize even distribution between both males and females as well KT and NT groups. Tabulation of these KT and NT participants according to their sex and blockings can be found in Appendices B and C.

A baseline homogeneity was not done on the sex as the two groups had equal male and female participants. The normality of the ages and the years of experience were calculated using Shapiro-Wilk tests and a deviation from normality was shown in all groups: ages of KT ($W = 0.91$, $p\text{-value} = 0.01$), ages of NT ($W = 0.88$, $p\text{-value} < 0.01$), years of experience of KT ($W = 0.92$, $p\text{-value} = 0.01$), and years of experience of NT ($W = 0.92$, $p\text{-value} = 0.01$). The baseline homogeneity between the ages and years of experience of NT and KT were analyzed using two Mann Whitney U tests. The tables below show the baseline homogeneity of ages and years of experience of both KT and NT groups to show that these two groups are homogenous.

The table below shows the baseline mean ages of the Kinesiology Tape (KT) ($M = 20.56$, $SD = 2.21$) and No Tape (NT) ($M = 20.94$, $SD = 2.84$) groups. A Mann Whitney U test was used to determine whether a significant difference existed between the two groups. The resulting p-value (0.77) is greater than 0.05, indicating no statistically significant difference. This supports the assumption of baseline homogeneity, meaning the groups are comparable in terms of age.

Table 1

Baseline Homogeneity of Ages of KT and NT

	M	SD	Mann-Whitney U	p-value
KT	20.56	2.21		
NT	20.94	2.84	554.00	0.77

The table below shows the baseline mean years of soccer experience for participants in the Kinesiology Tape (KT) ($M = 7.38$, $SD = 4.82$) and No Tape (NT) ($M = 6.91$, $SD = 4.70$) groups. A Mann-Whitney U test was used to determine whether a significant difference existed between the two groups. The resulting p value (0.73) is greater than 0.05, indicating no statistically significant difference. Therefore, both groups can be considered homogeneous in terms of years of experience, supporting the assumption that they were comparable prior to the intervention.

Table 2
Baseline Homogeneity of Years of Experience of KT and NT

	M	SD	Mann-Whitney U	p-value
KT	7.38	4.82		
NT	6.91	4.70	606.50	0.73

Research Instruments

The researchers utilized the Illinois Agility Test. The validity and reliability of this test have already been tested by experts (Hachana et al., 2013). This test requires 8 cones to set up the course, and a stopwatch to measure the speed of the participant in doing the test. These instruments aided in providing measurable performance outcomes.

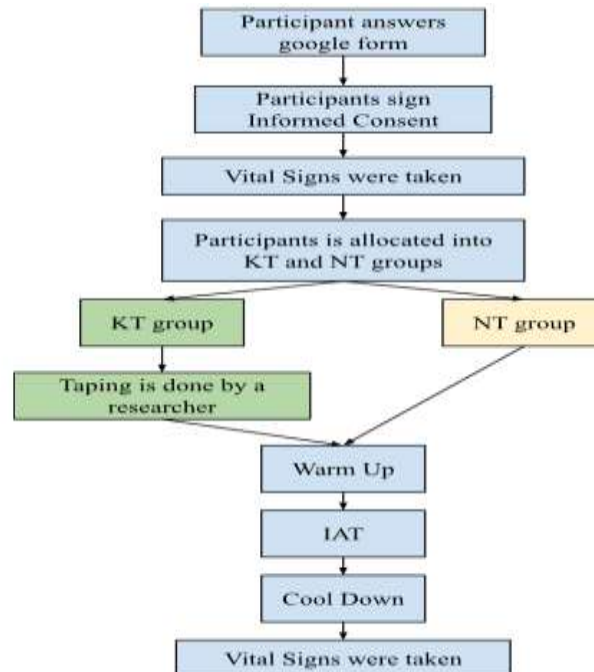
Outcome Measure: Illinois Agility Test is best used for team sports; it analyzes the agility of a player developed over time and will base the result on the normative values which you can grade a player’s agility (Mackenzie, 2010). In a study by Young et al. (2015), they took a look at different tests that measure the change of direction and agility and stated that agility is a better determinant for which athlete is higher or lower standard. Tests like Arrow-head agility test, Illinois agility test, T-test, and pro-agility test have all previously been referred to as tests to measure agility (Walker, 2024). Its reliability and validity have been studied including other performance-based outcomes. According to Raya et al. (2013), they have concluded that it was reliable using their population of nondisabled fit active duty male service members between the ages of 8 and 40 yrs. Their test-retest reliability was moderate to good for their population, this indicated that the test was stable when there was no appreciable change over time.

Data Gathering

Two researchers were certified by a licensed physical therapist on the proper application of kinesiology tape (see Appendix D). The Illinois Agility Test is freely available online through resources such as Hachana et al. (2013), Raya et al. (2013), Amiri-Khorasani et al. (2010), Alanazi (2015), and Miller et al. (2006). Although the Illinois Agility Test is easily accessible in the aforementioned resources, to enhance credibility, an expert was contacted. The researchers hired a licensed physical therapist specializing in sports and has had extensive experience in training soccer players to certify one researcher from the group to conduct an Illinois Agility Test during the days of data gathering (Appendix E). This researcher was in charge of setting up the course, conducting dry runs and timing the participants. The specific professionals that aided the researchers in the data gathering and their qualifications can be found in Appendices F and G. Letters were sent to various coaches to inform them of the study and to request their cooperation in the implementation of this study (Appendix H). After receiving confirmation from each coach, they were sent the aforementioned google form, to send to their respective teams for dissemination so that the researchers could gather their demographic information. If the coach was unresponsive or an individual was identified to be a potential participant, an invitation letter (Appendix I) was sent to all potential participants, informing them of the data gathering dates. Blinding of researchers and participants was not possible in this study, as the taped group received the tape application, while the no-tape group did not. Two Mann-Whitney U tests were used to test for homogeneity between KT and NT. A total of seven days of data gathering were done to maximize data collection based on the participants’ availability.

On each day of data gathering, the researchers arrived an hour early at Rusi ballfield. The certified IAT group member measured the distance between each marker and placed the markers while another research member held the measuring tape in place. The aforementioned researchers built a course using cones as markings (Appendix J). Eight markers were required to set up this test. Four of the markers were used to form a square 10m long by 10m wide. The other four were placed in a straight line in the center of the square at 3.3 m intervals. The start and end cones were replaced by gates using two cones each. This was the set-up taught by the specialist.

Figure 3
Flow of Data Gathering Proper



Prior to Illinois Agility Test: One at a time, each participant was called to sign the informed consent (Appendix K) and confirmed if they had answered the google form for easier tracking. During this, their eligibility and demographic data (age and years of experience) were also verified so that they can be divided and allocated to the KT or NT group. Two members of the research group took the vital signs of the participants. The vital signs that were measured are the blood pressure and resting heart rate. The blood pressure was measured using a sphygmomanometer and stethoscope. The heart rate was measured using a pulse oximeter. The participant was excluded from the study if the blood pressure is >180/110 mmHg and if the resting heart rate is >120 bpm (Heart Online, n.d.). The vital sign measurements were completed before proceeding with the taping and warm-up.

Procedure for KT Group: The KT underwent a taping procedure using a Y strip to facilitate the vastus medialis oblique (Appendix L). The kinesiology tape that was used were all from the same brand and store. One at a time, KT participants were called randomly. Each participant sat on the ground and one of the two researchers certified to do the kinesiotaping performed the procedure on each KT participant.

Procedure for NT Group: The NT group did not have any tape applied. Participants were called randomly to complete a five-minute warm-up consisting of nine exercises: knee grab, hip rotator, foot grab, leg swing, lateral hip swing, high knees, butt kicks, and walking toe touch (Halse, 2023; TOCA Football,

2023). The photos and descriptions for the warm-up can be found in Appendix M. This warm-up duration aligns with the five-minute recommendation by Frikha et al. (2016). The warm-up procedure was the same for all participants. Participants were then oriented by having the researcher demonstrate the run then the participants performed a dry run. After resting, the participant proceeded to the Illinois Agility Test. Once all participants in the NT group finished, the participants from the KT group that had already been taped were called the same way as the NT group, underwent their warm-up procedure, were given an orientation with a dry run, and followed by the agility test.

Procedure for Illinois Agility Test: The Illinois Agility Test followed the preparatory activities for both groups. The stopwatch started at the “go” command and stopped when the athlete reached the last cone. Only the licensed physical therapist for the Illinois Agility test timed the participants to maintain reliability. The path that the athletes must follow is shown in the aforementioned Appendix J. In this test, the athlete began by lying face down at gate A. When given the “go” command, the athlete sprinted forward 10 m to marker B, performed a U-turn, and sprinted back in the opposite direction. When approaching the starting position, the athlete veered diagonally to the left and entered an agility course consisting of four markers in the center of the square. The athlete ran in a zigzag, weaving around the obstacles. When the athlete reached the end of the course, the athlete turned around and performed the same pattern back to the starting position. After weaving through the last marker, the athlete made a U-turn to the left and sprinted toward marker C, then made a final U-turn and sprinted straight ahead to gate D. This was as taught by the expert. The times in each were recorded by the certified member and another member of the research group wrote it down in each participant’s respective questionnaire.

Once a person finished the agility test, a five-minute cooldown consisting of static stretching began immediately. This cooldown routine included quadriceps stretch, hamstrings and calves stretch, glutes stretch, hip flexors stretch, adductors stretch, and wide child’s pose with each stretch performed in a single set of 30 seconds per leg (Buick, 2023). Details of the cooldown exercises can be found in Appendix N. This cooldown duration is a total of five minutes which is as recommended by the American Heart Association (2017). The next person that finished their warm-up immediately got oriented then after some rest, started the agility test. Vital signs were taken by the research members after cooldown. This cycle went on until the last participant was finished. The entire procedure, from vital signs, to before taping, to vital signs after cooldown, were documented using a data sheet (Appendix O). Photos and videos were taken by the research members

Data Analysis and Statistical Tests

The data collected included the time, measured in seconds and milliseconds, that each participant took to complete the agility test. The data was arranged in an excel format and was analyzed using statistical tools. Prior to the days of testing, two Mann-Whitney U tests were used to check the homogeneity between the ages and years of experience of the KT and NT groups. The scores of the NT and KT groups underwent statistical analysis. To address research questions one and two, the mean and standard deviation of the agility test times were computed for both the KT and NT group as part of the descriptive statistics. The results of the male and female were separated.

To interpret the participants’ agility scores, the researchers used previous data to do a regression analysis using linear regression. Data from Hachana et. al (2013) was used. Their study had a population of male college athletes with a mean age of 20.33. Their mean time for the Illinois Agility Test was 16.30 seconds. Their study also included a re-test but the test value aligned more with the researchers’ study since the researchers’ only tested the participants once. The other data point for the regression analysis comes from

Roozen et al (2004). They have normative values for the test with descriptors. The ages for their population ranged from 16- 19 years old. From this, the midpoint which is 17.5 was used. The “Average” descriptor in their study was assumed to be the statistical average. Since a range was used, the midpoint of the descriptor was used. The study from Hachana et al. (2013) only had male participants so only the male “Average” values were taken into consideration to form the slope. This value was 17.15. From these two values, (20.33, 16.30) and (17.5, 17.15), a slope of -0.3 was found. The mean age of all the participants in the researchers’ study is 20.75 years old. From the regression analysis, the time for males of this age is 16.12. For females, the difference between their mean from the males’ mean in Roozen et al. (2004) is 2.7 so it was added, totaling 18.82 for females in the researchers’ study. The same ranges in Roozen et al. (2004) were used to find the rest of the values.

Table 3
Performance Level Interpretation

	Excellent	Good	Average	Fair	Poor
Male	<13.32	13.32-15.21	15.22-17.12	17.13-17.22	>17.22
Female	<16.12	16.12-16.96	17.02-20.72	20.73-21.92	>21.92

A Shapiro-Wilk test was used to find the distribution of the data to choose an appropriate statistical tool. The findings suggested a normal distribution ($W = 0.87$, $p\text{-value} = <0.01$) in the KT group and a normal distribution ($W = 0.96$, $p\text{ value} = 0.22$) in the NT group. To address research question three, for the inferential statistics, the Mann-Whitney U test was used to find the U-statistic. This test is used to compare two independent sets of data with non-normal distribution which matches this study. The p-value of the two groups of data was also calculated. Male and female participants were not separated. From these two, the p-value was noted either to be above or lower than 0.05. This was used to compare the KT and NT groups.

Ethical Consideration

In accordance with the WMA Declaration of Helsinki – Ethical Principles for Medical Research Involving Human Participants (2024), this study upheld respect for human dignity, autonomy, and the rights of all participants. The researchers were committed to conducting this study with scientific integrity, transparency, and adherence to ethical standards. Compliance with the guidelines established by Silliman University’s Research and Development Center was also observed throughout the research process as well as approval from the University Research Ethics Committee (see Appendix Q) was acquired before the implementation of the study.

Participants were provided with detailed information about the study’s purpose, methods, anticipated benefits, potential risks, and their rights, ensuring fully informed and voluntary consent before participation. The right to withdraw from the study at any point, without penalty or reprisal, was explicitly communicated and respected.

The principle of beneficence guided the researchers in maximizing benefits while minimizing any potential risks or harm to participants. Nonmaleficence was also strictly upheld, ensuring that no intentional physical, psychological, or emotional harm comes to any participant. Privacy and confidentiality was protected at all times through secure data management practices. Collected data was

only accessible to the research team, the research adviser, and the research coordinator, and will be securely stored. To further ensure privacy, all data will undergo data wipe after five years.

The researchers were also committed to transparency in reporting findings, ensuring that the study results are accurate, honest, and contribute meaningfully to scientific knowledge. Any conflicts of interest were to be disclosed, and the study was conducted in accordance with legal and ethical norms to ensure the integrity and credibility of the research process. All information obtained was used solely for research purposes, and no personal or sensitive data will be made public.

Through these measures, the researchers affirm their dedication to the principles of the Declaration of Helsinki, ensuring the ethical and respectful conduct of medical research involving human participants.

IV. PRESENTATION, DISCUSSION AND ANALYSIS, AND INTERPRETATION OF DATA

This section presents the results, discusses key findings, and provides analysis and interpretation of the data. It specifically examines participants' agility with and without kinesiology taping applied to the vastus medialis oblique muscle when grouped according to sex, and evaluates whether a significant difference exists between the two conditions.

Agility Performance of Male and Female Soccer Players in Dumaguete City with KT

The table below presents the mean agility performance (in seconds) of participants who had tape applied to the vastus medialis oblique, grouped by sex. It also shows the interpretation of the mean score for each sex which are poor for males and poor for females respectively. The mean score for the males are 19.28 seconds (SD = 1.03) while the females are 22.71 seconds (SD = 2.33). This answers the first research question

Table 4

Agility Performance of Soccer Players in Dumaguete City with KT According to Sex

	M	SD	Interpretation
Male	19.28	1.03	Poor
Female	22.71	2.33	Poor

Agility Performance of Male and Female Soccer Players in Dumaguete City without KT

The table below presents the mean agility performance (in seconds) of participants who did not receive taping, grouped by sex. It also shows the interpretation of the mean score for each sex which are poor for males and poor for females respectively. The mean score for the males are 20.17 seconds (SD = 1.96) while the females are 22.93 seconds (SD =2.24). This answers the second research question.

Table 5

Agility Performance of Soccer Players in Dumaguete City without KT According to Sex

	M	SD	Interpretation
Male	19.28	1.03	Poor
Female	22.71	2.33	Poor

Comparison of Agility Performance of Soccer Players in Dumaguete City With and Without Tape

The table below compares the mean agility performance (in seconds) of the participants under the two conditions: with taping and without taping. It highlights differences in performance based on if they are taped or not. A Mann Whitney U test was performed because it is used for comparing two independent sets of data and because the data of KT and NT did not have normal distribution. The resulting t-statistic and p-value indicated a result that showed no significant difference between the two groups ($p < 0.05$). The mean score taping (20.90 seconds)(SD = 2.46) and without taping (21.47 seconds)(SD = 2.49). This answers the third research question. The p-value is 0.22; which makes the result of the test not significant, therefore accepting the null hypothesis. The computation of the KT and NT group were made without the consideration for sex when finding the mean for both groups. The male and female groups were added together to get a mean for the KT and NT groups. The CV was calculated to check for variability of the agility times. The KT group has a CV of 11.77% while the NT group has 11.60%. These values suggest that the data within each group were relatively consistent, with minimal variability in participants' performance.

Table 6

Comparison of Agility Performance of Soccer Players in Dumaguete City with KT versus without KT

	M	SD	Mann-Whitney U	p-value	CV
KT	20.90	2.46			11.77%
NT	21.47	2.49	477.50	0.22	11.60%

Discussion

The data shows the agility performance of male and female soccer players who were taped had a mean of 19.28 seconds for males and 22.71 seconds for females. Based on the normative values an interpretation of the means were seen as poor. These findings indicate that both sexes who were taped with KT were classified as poor agility performance in IAT standards. This outcome aligns with previous research that questions the effectiveness of KT in enhancing physical performance, particularly among healthy, non-injured athletes. The studies conducted by Alrawaili (2019) and Solomon et al. (2013) provide strong contextual support for these results. Alrawaili (2019) found no significant changes in muscle strength or endurance following KT application in healthy soccer players, while Solomon et al. (2013) observed no improvement in agility among taped female athletes. In line with these findings, the current study also observed no enhancement in agility performance, with both sexes falling within the poor normative range despite KT application. These consistent results suggest that KT may offer limited neuromuscular or proprioceptive benefit in already healthy individuals, where there is little dysfunction to address. This reveals that KT may be non-discriminative when it comes to sex. Thus, the use of KT for performance enhancement in non injured athletes, particularly for improving agility, appears to be unsupported by current evidence. The results also imply that KT likely cannot compensate for the poor agility in soccer players, challenging its use as a performance enhancement modality in athletes.

In response to the second research question, this data demonstrates the agility performance of male and female soccer players without kinesiology tape revealed mean times of 20.17 seconds (SD = 1.96) for males and 22.93 seconds (SD = 2.24) for females. Based on the normative values for agility, the interpretation for both male and female groups were categorized as poor in agility performance. These findings indicate that without taping intervention, both sexes have demonstrated poor levels of agility performance according to IAT standards. Males having more agility performance than females are consistent with Pojskic et al. (2018), who attributed that males have higher greater power and speed capacities than females. Similarly, Chatanna et. al (2024) reported sex-based differences between males and females while using the IAT. In relation to the results of the study, regardless of their different testing protocols, they agree that males consistently outperform females. Although males performed faster than females, they are both categorized with poor agility performance. Training and physical conditioning may influence the agility performance, where there may not be sufficient to reach higher levels of agility. Additionally, this outcome may also be influenced by the absence of agility performance norms or benchmarks specific to Filipino soccer players, which could provide more relevant standards for evaluating agility within this population, indicating a need for localized norms specific for this population. While the results support the established trend on sex-based differences on existing literature. The overall agility performance of both groups are still categorized as poor which highlights the importance of considering additional factors such as different training protocols and the need for localized benchmarks which may improve the accuracy of future assessments.

The results of this study found that there is no statistically significant difference in the agility performance between participants who had kinesiology taping (KT) applied on their vastus medialis oblique and those who did not. These results are consistent with that of Mackey et al. (2020) who found that although KT may lead to occasional perceived improvements in function, they often lack clinical or statistical significance. Similarly, Espí-López et al. (2019) reported that KT alone did not lead to measurable improvements in lower-limb function among amateur soccer players. Although they noted positive effects when KT was paired with balance training indicating that KT alone may not produce significant performance benefits unless used as an adjunct to other targeted interventions. In contrast, the results of this study differ significantly from that of the study of Choi and Lee (2018) despite similarities in population. A key contributing factor to the difference in results could be that they targeted the entirety of the quadriceps muscle while this study isolated the target muscle to only the vastus medialis oblique. The same can also be observed in the study by Cochrane et al. (2023) in which they targeted the gluteus medius in addition to the VMO. The results of Choi and Lee (2018) and Cochrane et al. (2023) suggests that targeting multiple muscles simultaneously may yield more comprehensive performance benefits. The results of this study also disagree with the study by Biz et al. (2022) who found that KT, especially when combined with exercises, effectively improved ankle function, stability, and performance in athletes with chronic ankle instability. This difference could be attributed to the target population specifically in that participants for the current study were healthy, trained soccer players who likely possessed optimal levels of proprioception, neuromuscular coordination, and physical conditioning as compared to athletes with chronic ankle instability. This implies that kinesiology taping could be more beneficial in rehabilitation settings or among populations with proprioceptive deficits. The results of the study in adjunct with relevant literature imply that KT's influence on agility performance is context dependent in which contributing factors like the target muscle(s), whether it's used alone or with other interventions, and the characteristics of the population could potentially affect agility performance. This study reveals that KT's

role may differ in rehabilitation versus performance settings. Particularly, populations that have proprioceptive and neuromuscular deficits may have more observable gains as compared to populations already at optimal performance because they have more room for functional improvement. Additionally, the computation of KT and NT group mean scores did not consider sex. However, the coefficient of variation was also calculated to check the consistency of agility performance within each group. Because the KT group had CV of 11.77% and the NT group had a CV of 11.60%, the data collected were implied to have relatively consistent data within each group and minimal performance variability among participants. This consistency supports the reliability of group comparisons, suggesting that the absence of a significant difference is unlikely due to a random variability in individual performance.

V. SUMMARY, CONCLUSION, AND RECOMMENDATIONS

Summary

The primary objective of this study was to determine if there is a significant difference between the agility of healthy, trained soccer players in Dumaguete City when kinesiology taping (KT) is applied to the vastus medialis oblique (VMO) muscle versus to those without tape (KT). This research utilized a quantitative design, specifically a quasi-experimental descriptive-comparative approach to identify the agility performance of male and female soccer players from Dumaguete City and to find out if there is a significant difference between those soccer players that had KT applied on their VMO versus those who did not. From 97 potential participants, 68 were included in the study. These 68 players were divided into those with kinesiology tape (KT) group that consisted of 34 participants applied to their VMO (18 males, 16 females) which had scored poorly in the test. The second group was the no tape group (NT) which were 34 participants (18 males, 16 females) which had also performed poorly in the test. Their agility performance was measured using the Illinois Agility Test and statistically compared both groups using a Mann Whitney U test. The agility performance of the both groups according to sex were poor for the male and female participants, respectively. When compared, there was no statistically significant difference found between the agility scores of the KT and NT groups. Thus, the null hypothesis was accepted. This study found no significant difference in the agility of soccer players in Dumaguete City when kinesiology tape is applied on the vastus medialis oblique muscle versus those with no tape.

Conclusion

This study investigated the comparative agility performance of university varsity soccer players with and without kinesiology taping (KT) applied to the vastus medialis oblique (VMO) muscle. The findings indicated that there was no significant difference in agility performance between those who were applied with KT to the vastus medialis oblique and those who were not, therefore accepting the null hypothesis. Although the results were not statistically significant, the study contributes to the existing literature by offering meaningful contributions to the growing body of research on the practical use of kinesiology taping in athletic performance. The lack of significant results suggests that KT applied to the VMO may not yield immediate agility benefits in healthy, uninjured athletes. This aligns with previous research questioning the performance-enhancing effects of KT in similar populations. Despite its limitations such as non-randomized sampling and homogenous sample the study employed a structured protocol and standardized agility testing, enhancing its internal consistency. Additionally, this study can also contribute to filling research gaps regarding KT's impact on agility, especially with specific applications like taping only the vastus medialis oblique (VMO). It also highlights the need for further investigation into different taping methods, target muscle groups, and testing timelines. While KT may still offer perceived benefits

such as increased proprioceptive feedback or psychological support, its role as a strategy to enhance agility remains inconclusive. Further research is recommended to examine the comparative outcomes of KT under different application protocols, across various athletic populations, and at multiple testing intervals to better understand its potential contributions to athletic performance.

Recommendations

Based on the findings of the study, several recommendations are made for relevant stakeholders. Since there were no statistically significant differences found, soccer players may be informed that while KT does not appear to significantly enhance agility or performance based on this study's outcomes, some individuals might still perceive subjective benefits, such as increased confidence or muscle awareness. Therefore, players are encouraged to evaluate its use on a case

by-case basis, keeping in mind that any effects may be psychological rather than physiological.

Based on our findings, since there was no statistically significant difference found, coaches should be informed that they should not solely rely on the kinesiology tape and are encouraged to prioritize structured exercise programs and sport-specific training when aiming to improve agility and performance. If future evidence supports the KT in certain contexts, it may be considered as a complementary tool rather than a primary strategy.

For physical therapists, the findings suggest that KT over the VMO should not be relied upon as a standalone intervention for enhancing agility. Nonetheless, therapists may still use KT as a supplementary tool for individual cases where athletes report subjective improvement or where it aids in proprioceptive feedback during rehabilitation.

Based on the limitations encountered in the study, several recommendations are proposed for future research. First, it is suggested to conduct multiple testing sessions instead of a single test to obtain more consistent and reliable data, since in this study, there was no pre- and post-test but two different groups with and without tape respectively. Expanding the geographical coverage beyond one city can also improve the generalizability of the findings. Moreover, future studies could explore the application of tape on other parts of the body or on multiple areas simultaneously to assess its broader effects since in this study, only one muscle from a muscle group was applied with kinesiology tape. Additionally, factors such as body mass index (BMI) and weight may influence agility outcomes and should be considered in future research for a more comprehensive analysis. Utilizing a variety of agility tests or conducting repeated runs of the same test or even designing the study longitudinally can provide deeper insights into changes over time. Investing in better quality tape is recommended, as the use of low-grade materials often results in poor adherence, especially in sweaty or hairy areas, leading to frequent reapplication.

VI. DECLARATIONS

Declaration of Competing Interests

The authors of this research paper declare that there were no known financial or personal relationships that could have influenced the findings reported in this study. No financial aid, sponsorship, or personal gain has been obtained in connection or association with the research, authorship, or publication of this paper. The authors affirm that the content presented is unbiased and free from any competing interests that may affect the integrity and objectivity of the findings.

Declaration of Originality

The researchers namely Michael Matthew Montesa, Hannah Shaylene Louise Pulao, Chelsea Anne Rallos, Raven Jude Rosales, Kawther Asenath Rubin, Angelle Marc Tilos, and Rencee Villanueva, hereby

solemnly declare that the research paper entitled “Kinesiotaping Versus No Tape on the Agility Performance of Soccer Players in Dumaguete City: A Comparative Study” in partial fulfillment of the requirements for the degree of Bachelor of Science in Physical Therapy, is the result of the researchers’ own original and independent research work. This paper has not been previously submitted to any academic institution or published elsewhere, and to the best of my knowledge and belief, does not contain any work previously published or written by another individual unless explicitly cited and acknowledged. Furthermore, this research does not contain data or content that has been falsified, plagiarized, or fabricated. Permission was also sought and obtained, where necessary, for the use of any copyrighted materials, including but not limited to text, illustrations, and conceptual frameworks incorporated within the study.

The researchers fully understand that should the Institute of Rehabilitative Sciences of Silliman University, through its Administrators and Faculty, find any evidence that contradicts the declarations stated herein, to accept and acknowledge their right to impose the appropriate academic sanctions, which may include the revocation or cancellation of any academic degree granted based on this research submission.

Declaration of AI Use

I hereby declare that artificial intelligence tools, specifically OpenAI’s GPT-3 and Perplexity.AI, were utilized during the development of this manuscript. These tools were used solely for the purpose of improving language clarity, structure, and overall readability of the paper.

All AI-assisted content was thoroughly reviewed and edited by the author to ensure academic accuracy, coherence, and originality. The use of these tools did not influence the research process, data interpretation, or the formulation of conclusions. The author assumes full responsibility for the final content and ensures that all ideas, analysis, and interpretations presented in this paper reflect their own scholarly work and academic integrity.

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