

The Effect of Kinesiotaping on Ankle Functional Performance in Male Adolescent Futsal Athletes with Previous Ankle Sprain

Dominggus Ruku Yudit Pramono¹, Yustina Kristiangsih², Yunita Wiguna³

^{1,2,3}STIKES Katolik St. Vincentius a Paulo Surabaya, Jl. Jambi 12-18 Surabaya, Jawa Timur, 60241, Indonesia

Correspondence: yuditmackhz@gmail.com

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ABSTRACT

Background: Ankle sprain is one of the most common injuries among futsal athletes, particularly in adolescent players who frequently perform rapid and explosive changes of direction during play. This injury can reduce ankle joint stability and negatively affect athletes' functional performance. One intervention commonly used in sports physiotherapy to improve joint stability and function is kinesiotaping. This study aimed to determine the effect of kinesiotaping on the improvement of ankle functional performance in male adolescent futsal athletes with a history of ankle sprain.

Methods: This study employed a pre-experimental design with a pre-test and post-test approach. The sample consisted of 25 adolescent futsal athletes, selected using a total sampling technique. Ankle functional performance was measured before and after the application of kinesiotaping using an ankle functional performance measurement instrument. Data were analyzed using a paired sample t-test after conducting a normality test.

Results: The results showed an increase in the mean ankle functional performance after the application of kinesiotaping. The mean pre-test score was 93.16 ± 7.84 cm, which increased to 105.48 ± 8.62 cm in the post-test, with an average improvement of 12.32 cm. Statistical analysis showed a p-value of 0.000 ($p < 0.05$), indicating a significant effect of kinesiotaping on the improvement of ankle functional performance.

Conclusions: The application of kinesiotaping has been shown to have a significant effect in improving ankle functional performance in adolescent futsal athletes with a history of ankle sprain. This intervention can be used as a supportive method in injury prevention programs and performance enhancement for futsal athletes.

Keywords: kinesiotaping, ankle sprain, performance fungsional ankle, futsal athletes, adolescent.

1. Background

Ankle sprain is one of the most common injuries in sports activities, particularly in futsal. This sport is characterized by explosive movements and rapid changes in foot placement. These characteristics can increase the risk of ankle sprain injuries (Gene-Morales et al., 2021). This condition is influenced by several factors that support ankle joint stability, including neuromuscular factors such as muscle strength, balance, proprioception, agility or muscle power, and core stability. The phenomenon of chronic ankle injuries that are not properly managed is frequently found among young futsal athletes. When an ankle sprain occurs, athletes experience a decline in functional ability and increased instability of the ankle joint. This condition greatly affects athletic performance, leading to decreased performance (Peterson, 2000). In addition, approximately 70 percent of ankle sprain injuries develop into chronic ankle sprain (Herzog et al., 2019). An ankle sprain that is not properly managed may negatively impact an athlete's performance during futsal activities (Gene-Morales et al., 2021).

The ankle joint is one of the joints most frequently injured in soccer-related sports. In futsal events,

ankle injuries account for approximately 11% to 23% of all injuries reported during official FIFA matches. Across all levels of soccer players, including children, adolescents, amateurs, and professionals, ankle injuries remain the most common, representing about 35% of all injuries (Brukner & Khan, 2012). When an ankle sprain occurs, athletes experience decreased functional ability and increased ankle joint instability. This condition significantly affects athletic performance, resulting in a decline in performance (Peterson, 2000). Soccer athletes who have a history of ankle sprain are at greater risk of developing instability. Post-ankle sprain instability can lead to physical limitations that affect athletic performance during sports activities. Joint instability can be classified into two types: mechanical instability and functional instability. Mechanical instability occurs due to structural deficits, such as ligament weakness or articular degeneration, and in some cases may require surgical intervention. Meanwhile, functional ankle instability is caused by insufficiency in proprioception, neuromuscular control, postural control, and muscle strength (Dootchai et al., 2005).

Kinesiotaping is a taping method that uses a non-latex adhesive material applied directly to the body or skin for specific purposes, such as reducing pain, decreasing swelling, improving performance, and preventing injuries. In professional competitions, it is commonly observed that athletes use kinesiotaping to achieve certain goals, particularly for injury prevention. By applying kinesiotaping to athletes with a history of ankle sprain, it is expected that they can achieve optimal performance both during training and competition. Based on the explanation above, the researchers were interested in investigating the effect of kinesiotaping application in athletes with a history of ankle sprain to determine whether it influences their functional performance

2. Methods

The research design used in this study was a One Group Pre-Test and Post-Test Design. The sample in this study consisted of male adolescent futsal athletes who were actively participating in the AAFI/AFK Futsal League in Surabaya. The participants were adolescent athletes aged between 14 and 18 years. The inclusion criteria were: (1) willing to participate as respondents, (2) aged between ≥ 14 and 18 years, (3) having a history of ankle sprain, and (4) willing to have kinesiotaping applied as part of the study. The sampling technique used in this study was simple random sampling. A total of 25 respondents participated in this study. Based on age distribution, 15 respondents (53.3%) were aged 16–18 years, and 10 respondents (46.7%) were aged 19–21 years.

The data collection was conducted at Nisrina Futsal Field, Surabaya. After determining the research participants, the researchers collected data by conducting the Single Leg Hop Test (SLHT) for each respondent as the pre-test measurement. Kinesiotaping was then applied to the ankle with a history of ankle sprain. After the application of kinesiotaping, the researchers conducted the Single Leg Hop Test (SLHT) again as the post-test measurement. Data processing and analysis were performed using numerical data. The statistical analysis included the Shapiro–Wilk test for normality and the paired sample t-test to determine the effect of the intervention.

3. Result

A total of 25 athletes participated in this study. Based on age distribution, 15 respondents (53.3%) were aged 16–18 years, while 10 respondents (46.7%) were aged 19–21 years.

Table 1. General Characteristics of the Respondents

Variable	n	%
Age		
16-18	15	53,3
19-21	10	46,7
Education		
SMP	15	60
SMA	3	12
College	7	28

Based on Table 1, the study involved 25 respondents with educational backgrounds of junior high school (60%), senior high school (28%), and higher education (12%). The measurement results showed an increase in the average ankle functional performance after the application of kinesiotaping by 12.32 cm compared to before the intervention. The pre-test mean value was 93.16 ± 7.84 cm, while the post-test mean value increased to 105.48 ± 8.62 cm.

The normality test showed a p-value > 0.05 , indicating that the data were normally distributed; therefore, the analysis was continued using a paired sample t-test. The results of the analysis showed a p-value < 0.05 (0.000), indicating that there was a significant effect of kinesiotaping on the improvement of ankle functional performance in adolescent futsal athletes with a history of ankle sprain.

4. Discussion

Ankle sprain is one of the most common injuries, particularly in sports activities and among the general population. Inadequate recovery may lead to the development of Chronic Ankle Instability (CAI). Approximately 20% of ankle sprain cases progress to CAI (Al-Mohrej & Al-Kenani, 2016). In soccer, the incidence of recurrent injury following ankle sprain is relatively high, reaching approximately 61% (Smith, 2016). Pain complaints, recurrent ankle injuries, and impaired functional activities are some of the common signs and symptoms of Chronic Ankle Instability (CAI). In addition to physical functional limitations, CAI may also increase the risk of degenerative changes in the articular cartilage, which may eventually lead to ankle osteoarthritis.

Two major factors contribute to and are associated with CAI, namely mechanical factors and functional factors. Mechanical factors include ligament laxity due to pathology, arthrokinematic limitations, synovial changes, and degenerative processes. Meanwhile, functional factors include impaired proprioception, neuromuscular dysfunction, postural control deficits, and decreased muscle strength (Hertel, 2002).

Proprioception refers to internally generated afferent information arising from peripheral areas of the body that contributes to postural control and joint stability. It consists of joint position sense, kinesthesia, and the sense of resistance or force (Riemann & Lephart, 2002). Proprioception is closely related to mechanoreceptors, which include joint receptors, muscle receptors, and cutaneous receptors. When mechanoreceptors are damaged due to injury, proprioceptive function is affected, leading to a reduced ability of the body to maintain balance. Therefore, the re-education of mechanoreceptors becomes important to improve ankle stability and dynamic balance (Ross, 2006). Neuromuscular Training Programs are exercise methods used by athletes that utilize sensory information processing and muscle control, which directly contribute to joint stabilization and movement patterns (Donald, 2006).

This study demonstrated that the application of kinesiotaping on the ankle joint was able to improve athletes' functional performance, as indicated by the increase in Single Leg Hop Test scores after the intervention. These findings suggest that kinesiotaping provides support to ligament structures and enhances ankle proprioception, thereby improving stability and functional ability during sports activities. This result is consistent with findings reported in previous studies (Hettle, 2013). The application of kinesiotaping has a significant effect on functional performance. The results of this study indicate that the application of kinesiotaping significantly improves ankle functional performance in adolescent futsal athletes with a history of ankle sprain. This is demonstrated by the increase in the mean ankle functional performance score from 93.16 cm in the pre-test to 105.48 cm in the post-test. This improvement indicates that kinesiotaping can provide additional support to the musculoskeletal structures around the ankle joint, thereby helping to enhance stability and functional ability during movement activities.

Kinesiotaping works by providing stimulation to the mechanoreceptors in the skin, which can enhance proprioception and neuromuscular control of the joint. Improved proprioception plays an important role in maintaining ankle joint stability, especially in athletes with a history of ankle sprain. With improved sensorimotor system ability to detect joint position and control movement, the risk of ankle instability may be reduced and functional performance can be improved. In addition, kinesiotaping may help reduce the load on tissues weakened by previous injuries. The elastic support provided by the tape facilitates the muscles surrounding the ankle joint, thereby improving muscle activation and movement coordination. This condition allows athletes to perform movements that require balance, agility, and rapid changes of direction more effectively.

The findings of this study are consistent with several previous studies reporting that the use of kinesiotaping can improve joint stability and functional performance in individuals with a history of ankle sprain. This intervention is commonly used in sports physiotherapy because it is non-invasive, easy to apply, and can be used during sports activities without restricting athletes' movements.

In the context of futsal, ankle stability is a very important component because the nature of the game involves rapid acceleration, sudden changes of direction, and physical contact between players. Athletes with a history of ankle sprain often experience instability, which may increase the risk of recurrent injuries. Therefore, the use of kinesiotaping can serve as an effective preventive and rehabilitative strategy to support athletic performance. However, this study has several limitations, including the absence of a control group in the study design and the relatively small sample size. Future studies are recommended to use a randomized controlled trial design with a larger sample size and to consider additional variables such as muscle strength, dynamic balance, and proprioception to obtain a more comprehensive understanding of the effectiveness of kinesiotaping.

5. Conclusion

The application of kinesiotaping has been shown to have a significant effect in improving ankle functional performance in adolescent futsal athletes with a history of ankle sprain. This intervention can be used as a supportive method in injury prevention programs and performance enhancement for futsal athletes.

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