

## REVIEW SCIENTIFIC PAPER

# Kinesio Taping as a New Trend in Enhancing Anaerobic Power: A Narrative Review

İsmail İlbağ<sup>1</sup><sup>1</sup>Institute of Health Sciences, İnönü University, 44000 Malatya, Türkiye**Abstract**

The purpose of this review was to examine the effects of KT on anaerobic power performance and to compile the methodologies and findings of the studies conducted in this field. The results of this research were compiled from studies meeting the predefined inclusion criteria, accessed through the keywords “Kinesio taping” and “anaerobic power” without a time limitation from the Web of Science, PubMed, and Google Scholar databases on 20.07.2024. The article selection process was carried out in accordance with the PRISMA diagram. As a result of the search, 22 articles were found. Considering the inclusion and exclusion criteria, a total of 18 articles were excluded, and 4 articles were included in the research. The results show that: 1) the participants were not athletes from any sports branch; 2) no power analysis was conducted to determine the sample size; 3) KT was only applied to quadriceps or hamstring muscle groups; 4) different techniques such as muscle facilitation technique, muscle inhibition technique, or I-shaped technique were used in KT application; 5) there was no standardization on the time interval between KT application and performance test; and 6) only the Wingate cycle ergometer test was used to determine anaerobic power. The conclusion of this research shows a consensus among researchers that KT increases anaerobic power regardless of the technique used, the time before the performance test, and the muscle it was applied to.

**Keywords:** *kinesio taping (KT), sports performance, anaerobic power*

**Introduction**

Developed by Japanese chiropractor Dr. Kenzo Kase, Kinesio taping (KT) was first introduced in Japan in 1979. Dr. Kase claimed that KT reduces pain by stimulating the neurological system, supports weakened muscles to restore proper muscle function, clears lymphatic fluid accumulations or haemorrhages under the skin, and improves joint alignment by reducing muscle spasms (Kase, 2010). Kinesio tape is made from hypoallergenic, latex-free cotton fibers with an acrylic adhesive. Its waterproof property allows the tape to remain in contact with the skin for 3-5 days. The tape can stretch up to 140% of its resting length and attempts to return to its original length after application (Kase, 2003).

KT was introduced to the United States in the 1990s (Kalron & Bar-Sela, 2013) but did not gain immediate popularity. However, KT received significant attention and gained popularity when athletes used it during the 2008 Beijing Olympics (Beutel & Cardone, 2014; Williams et al., 2012). Therefore, in recent years, the KT technique has been extensively researched for its poten-

tial therapeutic effects in rehabilitation and sports performance (Rossi et al., 2021; Stedje et al., 2012). The effects of KT include increased muscle strength and power in treated muscle areas (Fratocchi et al., 2013), pain relief (González-Iglesias et al., 2009), and promotion of skin blood and lymphatic microcirculation (Stedje et al., 2012). KT application is thought to help separate the skin from the fascia and increase blood flow, which could be beneficial for improving muscle oxygenation, reducing inflammation, and enhancing anaerobic and aerobic muscle functions (Kubo et al., 2008; Okamoto et al., 2006; Richardson, 1998).

Due to the physiological effects of KT, some researchers have attempted to use these methods to enhance anaerobic performance (Boobpachat et al., 2021). In this context, a crossover study conducted by Kim & Seo (Kim & Seo, 2012) showed that applying Kinesio tape to the quadriceps muscle significantly increased average and maximum power outputs in the 30-second Wingate test. Additionally, similar findings of performance enhancement have been reported in other studies (Dogan et al., 2021; Duruturk

Correspondence:

**Montenegro  
Sport**İ. İlbağ  
İnönü University, Institute of Health Sciences, 44000 Malatya, Türkiye  
E-mail: isma\_ilbag@hotmail.com

et al., 2016; Rossi et al., 2021). The trend of using KT to enhance sports performance has accelerated in recent years, with a growing number of studies focusing specifically on increasing anaerobic performance. Summarizing the general profile of these studies is crucial for guiding future research. Therefore, the purpose of this study is to examine the role of KT in enhancing anaerobic power performance and to compile the effective methodologies and findings used in the related studies.

### Methods

This review examines the effects of Kinesio taping on anaerobic performance. Studies were included based on searches conducted on the Web of Science, PubMed, and Google Scholar databases using the keywords “Kinesio taping” and “anaerobic power” without a time limitation on 20.07.2024. The article selection process was carried out in accordance with the PRISMA diagram (Moher et al., 2009), presented in Figure 1.

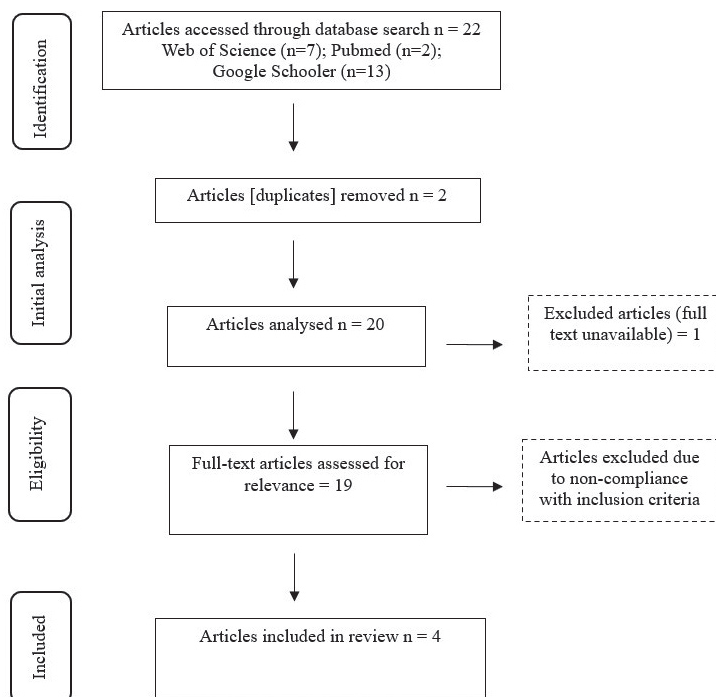


FIGURE 1. PRISMA flow chart of the article selection process

#### Inclusion Criteria

The studies included in this research met several specific criteria. Only original research articles that evaluated the effects of Kinesio taping on anaerobic performance were selected. There were no restrictions on the time interval for publication, and only articles written in English were considered. The participants in these studies were athletes, exercising individuals, or healthy adults. Additionally, the studies used valid and reliable tests to assess anaerobic performance, and Kinesio taping was applied using a standardized protocol. Finally, all included studies were required to be fully accessible as full-texts.

#### Exclusion Criteria

Studies that did not directly evaluate Kinesio taping, such as theoretical reviews or literature reviews, were excluded. Furthermore, studies involving participants with clinical conditions, injuries, or special circumstances were not considered. Research that did not use reliable methods to measure anaerobic performance or that applied Kinesio taping without following a standardized protocol was excluded. Additionally, studies with inaccessible full-texts were not included in this review.

Table 1. Research results

Author/Year	Participants	Taping Area	Application Technique	Taping Time	Anaerobic Performance Test	Results
Kim & Seo, (2012)	▪ 30 HM	▪ RF ▪ VM ▪ VL	▪ Muscle facilitation technique	▪ 7 days	▪ Wingate cycle ergometer test	▪ Anaerobic muscle power increased after Kinesio taping.
Dogan et al., (2021)	▪ 16 HM	▪ VM ▪ BF ▪ SM	▪ Muscle facilitation technique [VM], Muscle inhibition technique [BF, SM]	▪ Immediately before test	▪ Wingate cycle ergometer test	▪ Anaerobic muscle power increased after Kinesio taping.
Duruturk et al., (2016)	▪ 32 HM	▪ RF	▪ Muscle facilitation technique	▪ 45 minutes before test	▪ Wingate cycle ergometer test	▪ Anaerobic muscle power increased after Kinesio taping.
Rossi et al., (2021)	▪ 15 PAM	▪ VL ▪ VM	▪ I-shaped KT technique/ Longitudinally taped with 50% tension	▪ Not specified	▪ Wingate cycle ergometer test	▪ Sprint cycling performance increased with Kinesio taping.

HM: Healthy male; PAM: Physically active males; RF: Rectus femoris; VM: Vastus medialis; VL: Vastus lateralis; BF: Biceps femoris; SM: Semi membranous

## Results

The results obtained from the research are presented in Table 1.

## Discussion

The present review was conducted to examine the role of KT in enhancing anaerobic power performance and to compile the effective methodologies used in related studies. The main findings indicate that: 1) the participants were not athletes from any sports branch; 2) no power analysis was conducted to determine the sample size; 3) KT was only applied to quadriceps or hamstring muscle groups; 4) different techniques such as muscle facilitation technique, muscle inhibition technique, or I-shaped technique were used in KT application; 5) there was no standardization on the time interval between KT application and performance test; and 6) only the Wingate cycle ergometer test was used to determine anaerobic power.

When examining the relevant studies in terms of sample characteristics, it was found that the participants consisted only of male individuals (Dogan et al., 2021; Duruturk et al., 2016; Kim & Seo, 2012; Rossi et al., 2021). Considering the physical and physiological differences between men and women, it is possible that KT may not yield the same results in both genders. Performance parameters such as anaerobic power are influenced by factors such as gender, muscle type and mass, genetics, and body composition (Barber, 1994; Karasimav, 2019). Therefore, it is recommended that future research includes female participants. Additionally, when examining the participant groups in the studies, it was found that the participants were not athletes from any sports branch. Instead, they were healthy individuals (Dogan et al., 2021; Duruturk et al., 2016; Kim & Seo, 2012) or physically active individuals (Rossi et al., 2021). Components such as aerobic-anaerobic endurance can vary based on age, gender, sports level, and branch (Buckthorpe et al., 2019; Thiele et al., 2020). Therefore, it is recommended that future research includes athlete groups to determine the role of KT in enhancing sports performance. Furthermore, it was observed that reliable techniques (e.g., G\*Power analysis) were not used to determine the sample size in these studies. Calculating sample size is important for scientific, ethical, and economic reasons. Insufficient sample size may fail to detect significant clinical effects, while an excessive number of subjects may lead to statistically significant but clinically insignificant results, wasting resources and raising ethical concerns (Hickey et al., 2018). Therefore, it is recommended to use reliable techniques to estimate sample size in future studies.

When examining the KT methodologies used in the studies, it was found that Kinesio tape was applied to the quadriceps (Dogan et al., 2021; Duruturk et al., 2016; Kim & Seo, 2012; Rossi et al., 2021) or hamstring muscle groups (Dogan et al., 2021). Moreover, techniques such as muscle facilitation technique (Dogan et al., 2021; Duruturk et al., 2016; Kim & Seo, 2012), muscle inhibition technique (Dogan et al., 2021), or I-shaped KT technique (Rossi et al., 2021) were used. The facilitation technique is applied by stretching the KT from the origin to the insertion point of the muscle, while the inhibition technique is applied by stretching the KT from the insertion to the origin point (Yoshida & Kahanov, 2007). Additionally, the I-shaped KT technique is applied longitudinally with 50% tension (Rossi et al., 2021). Considering the findings of the studies, the general profile suggests that different techniques and different muscles do not yield different results regarding anaerobic power performance (Dogan et al., 2021; Duruturk et al., 2016; Kim & Seo, 2012; Rossi et al., 2021).

When examining the studies in terms of the time interval between KT application and performance test, it was found that the KT application was done immediately before the test (Dogan et al., 2021), 45 minutes before the test (Duruturk et al., 2016), or 7 days before the test (Kim & Seo, 2012). The general profile suggests that

different time intervals do not yield different results regarding anaerobic power performance (Dogan et al., 2021; Duruturk et al., 2016; Kim & Seo, 2012). However, the findings of the study conducted by Rossi et al. (Rossi et al., 2021) did not specify the time interval. Therefore, it is recommended that future studies standardize the time interval between KT application and performance test and examine the results.

Another important finding is that only Wingate cycle ergometer test is used to measure anaerobic power (Dogan et al., 2021; Duruturk et al., 2016; Kim & Seo, 2012; Rossi et al., 2021). Although Wingate cycle ergometer test is accepted as a reliable and valid test (Jaafar et al., 2014), alternative tests can also be applied. In particular, it is recommended to apply tests that are directly similar to the movement skills applied during many competitions. For example, multiple sprint test, 35 m sprint test, flying 30 metres test, Margaria-Kalamen power test, etc.

The analysis of the studies' results indicates a consensus among researchers that KT increases anaerobic power regardless of the technique used, the timing of application before the performance test, and the muscle to which it is applied (Dogan et al., 2021; Duruturk et al., 2016; Kim & Seo, 2012; Rossi et al., 2021). Therefore, it is recommended to continue research in this area to identify all potential effects of KT on anaerobic power performance.

There are some limitations to this study. In this context, the use of only the keywords "Kinesio taping" and "anaerobic power," and the search being conducted only through the Web of Science, PubMed, and Google Scholar databases, are among the limitations of this research.

## Conclusion

The findings show that the participants were not athletes from any sports branch, no power analysis was conducted to determine the sample size in the included studies, KT was only applied to quadriceps or hamstring muscle groups, different techniques such as muscle facilitation technique, muscle inhibition technique, or I-shaped technique were used in KT application, there was no standardization on the time interval between KT application and performance test, and only the Wingate cycle ergometer test was used to determine anaerobic power. The result of this research shows a consensus among researchers that KT increases anaerobic power regardless of the technique used, the time before the performance test, and the muscle it was applied to.

## Conflict of interests

The author reports no conflict of interest.

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