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Application of Kinesiology Tape: A Review

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ABSTRACT

Kinesiology taping had been first introduced by Dr. KenzoKase, a chiropractor and moxibustion practitioner in 1979. Due to the increase in the clinical trials had been done in these past years, various approaches was used to obtain the best information about the effectiveness of the kinesiology taping in treating musculoskeletal injuries in different area that affected. The purpose of this study was to perform a systematic review of the literature on the effect of kinesiology tape to improve outcomes, including performance, pain, function, and strength, followed by musculoskeletal injury. The kinesiology taping rehabilitation improve the pain intensity by increasing the passageway of lymph fluid and blood in the system through the skin lifting.

Keywords: *Kinesiology tape, rehabilitation, reducing pain.*

INTRODUCTION

Kinesiology taping had been first introduced by Dr. KenzoKase, a chiropractor and moxibustion practitioner in 1979 (S.Molle, 2016). Kinesiology tape had been alternative for traditional bandaging or wrapping technique when Dr. Kase develops this tape so that it can last for 5 days or 24 hours per day (S.Molle, 2016)which is later the usage of this tape expanded to equine athletes. In another paper written by (Montalvo, 2014), kinesiology taping allows the joint to move through its full range of motion while the mechanism of the action still under investigation.

The effectiveness of this tape is more satisfying compared to athletic tape that only support the fascia, muscle and joints and limiting the range of motion (Montalvo, 2014). When the usage of kinesiology tape had rose into popularity the quality of available evidence supporting its use were still in the dark.

Despite of all the researches regarding the treatment using this tape on the human athletes were-well covered including the area of the affected, the research about its treating on equine are scarce. In a paper written by (Montalvo, 2014), there is no significance in proving the effectiveness of kinesiology taping in treating musculoskeletal injury especially involving human athletes. In another research written by (S.Williams, 2012), kinesiology taping could have small beneficial advantage effect in improving the strength and active range of motion but with further clarification meaning that more research need to be done to prove it. According (D.P Artioli, 2016), kinesiology taping produced hypoalgesic effect and proved to be beneficial but there is no strong evidence proving this effect may be prolonged.

In another research, it compare the effect between the crossing tape and kinesiology tape, saying that kinesiology tape have more analgesic effect compared to crossing tape (T.Halski, 2015). Due to the increase in the clinical trials had been done in these past years, various approaches was used to obtain the best information about the effectiveness of the kinesiology taping in treating musculoskeletal injuries in different area that affected.

The purpose of this study was to perform a systematic review of the literature on the use of kinesiology tape to improve outcomes, including performance, pain, function, and strength, followed by musculoskeletal injury.

Main Results

All studies which describing the kinesiology tape application in treating musculoskeletal injuries and muscle were considered in this review regardless their technique, area affected and objectives. Both human and animal subjects are included in this review if they mentioned about the application of kinesiology tape. Relevant studies were identified and selected from following scientific database; Science Direct, Web of Science, and Springer Link database. Since this review is about to find the effectiveness of kinesiology tape hence, studies from period of 2015 to 2019 were included.

The literature search the keywords "kinesio tape" or "kinesiology tape" or "k-tape" and "effectiveness" or "function" or "purpose" or "strength" or "characteristic" and "pain" or "muscle" or "athlete" and "human athlete" or "equine athlete". These had resulted 618 455 articles.

The articles then reviewed with the inclusion and exclusion of criteria chosen been applied. The inclusion criteria were publications in English that investigated the outcome of the application after musculoskeletal injury in human and animal, athlete or non-athlete. Out of 524 original articles, 49 met the inclusion criteria.

After reviewed, 15 of 33 were excluded because of the word of kinesiology department in the article but not related to kinesiology taping, 3 for being case studies, 7 for being athletic taping, 5 for being review article, and 5 for being non-English language articles.

The flowchart of selecting process shown in Figure 1 while the results of the 14 articles pertaining the effect of kinesiology tape in effected area (12 human athletes, and 2 equines) were included in this study and summarized as shown in Tables 1 and 2.

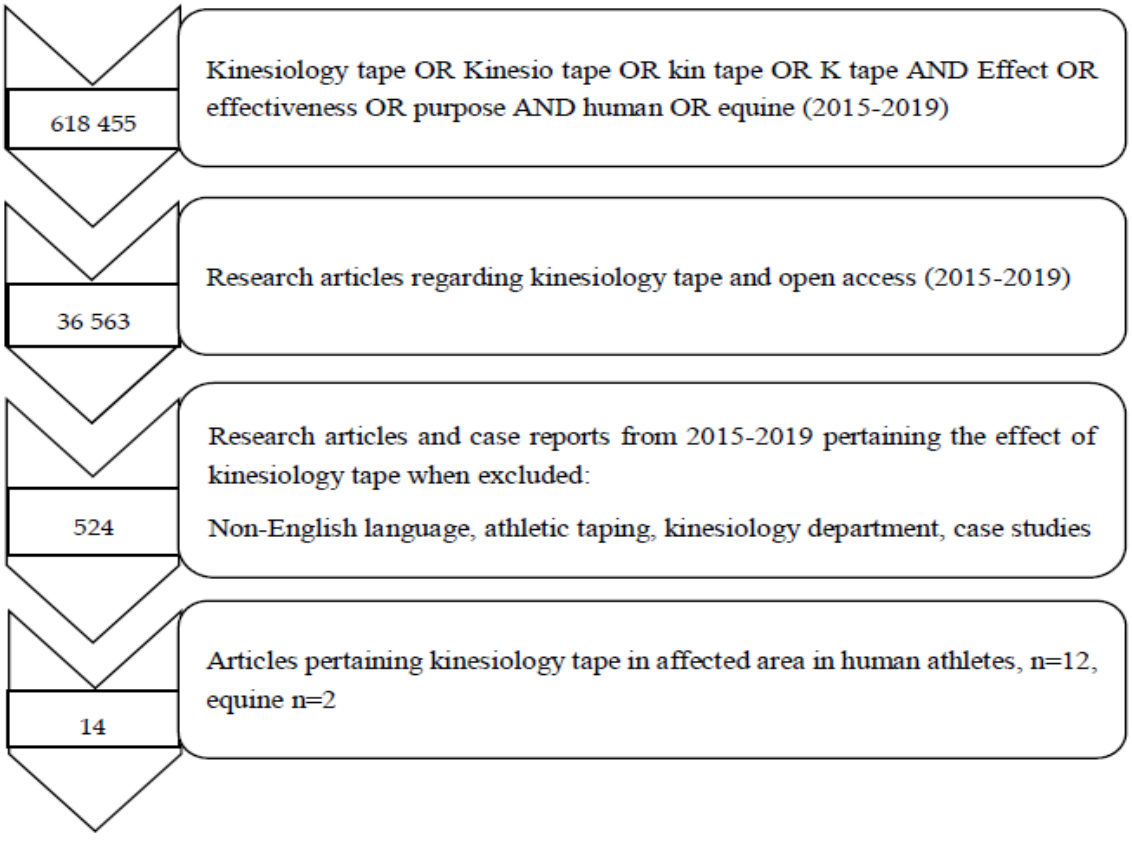

Figure1. *Flowchart of selecting journal articles and case reports.*

Table1. *A review on application of kinesiology type in affected area.*

Study	Objectives	Study design	Population	Problem
(H.Shakeri, 2018)	To investigate the effect of KT method on pain intensity, pain pressure threshold (PPT), grip	Randomized clinical trial	30 women with LE & MTP (mean 37.6 years old and 31.2 years old)	Elbow and forearm

	strength and disability individual with LE & MTP			
(A.Makeeva, 2016)	To find out the effect of Kinesio Taping on patients with low back pain	Undetermined	6 patients ranged from 56 years old to 70 years old	Low back pain
(A.M El-Abd, 2017)	To determine the effectiveness of KT versus correction exercises	Randomized blinded clinical trial	46 patients with mechanical neck dysfunction ranged from 20-40 years old	Neck
(S.Balki, 2016)	To investigate the effect of Kinesio Taping in acute post- operative rehabilitation of ACL patient	Double-blind, placebo controlled study	30 male patients with anterior cruciate ligament (ACL) with mean age 28.1 years old	Leg
(T.Halski, 2015)	To determine how cross tape (CT), kinesio tape (KT) and medical adhesive tape effect	Prospective, single blind, randomized, sham-controlled study	105 volunteers from Opole Medical Schoolranged from 18-26 years old	Upper trapezius muscle
(Y.Artici, 2017)	To investigate the short-term effects of KT on back pain	Randomized controlled trial	40 patients with back pain with Lenka Type 1 adolescent idiopathic scoliosis (AIS) ranged from 10 -18 years old	Back pain
(H.Goksu, 2016)	To compare the therapeutic effects of kinesio taping and subacromial injection	Single-blind, randomized trial	61 patients with subacromial impingement syndrome (SIS) with age mean 43.04 years old and & 6.31 years old	Shoulder pain
(G.S Nunes, 2015)	Is Kinesio Taping is effective in reducing swelling in athletes who have suffered an acute, lateral ankle sprain?	Randomized controlled trial	36 athletes with report of lateral ankle sprain occurred between 48-96 hours	Ankle sprain
(F.Qafarizadeh, 2016)	To investigate the effect of kinesio taping on hand function in individuals following stroke	Pre and post-test clinical study	8 individuals with hemiparesis post-stroke with the mean age of 57	Hand
(F.Cechetti, 2018)	To analyze the effect of acupuncture associated with kinesio taping on the upper limb in stroke patient	Prospective, randomized trial	16 participants with diagnosis of stroke and hemiparesis in upper limb (over 18 years old)	Upper limb
(C.T Domingo, 2015)	To examine the immediate and prolonged effect of KT on balance in subject with chronic ankle instability	Single blind, randomized, controlled trial	36 subjects with history of ankle joint injury, age range between 18-28 years old	Ankle joint
(Y.J Shin, 2018)	To assess the immediate effect of applying ankle aversion taping using kinesiology taping in patient with foot drop after stroke	Randomized cross-over trial	15 subjects with stroke history	Ankle
(A.Zellner, 2017)	To investigate the effects of Kinesio Taping on the trajectory of the forelimb and the muscle activity of the *M. braciocephalicus*and the *M. extensor carpi radialis*in horses	Experimental trial	19 horses and ponies with mean 14.9 years old and 6.9 years old	*M. bracioce phalicus*a nd *M. extensor carpi radialis*

(L.H.L Mattos, 2017)	To evaluate the effect of therapeutic bandage, the Kinesio taping method in controlling swelling in horses	Randomized clinical trial	12 mixed breed horse, aged between 3-5 years old, undergoing tibio-patellofemoral arthroscopy	Tibio-patellofemoral joint

DISCUSSION

Participant's Criteria

Based in earlier paragraph, 14 articles were chosen hence, explaining the variety number of subjects. For human athletes, in a study conducted by (A.Makeeva, 2016), it showed the smallest sample size, conducted on only 6 patients. To compare to the highest number of patients involved goes to the research conducted by (T.Halski, 2015), which conducted on 105 patients, as they need the patients to be randomized into three groups; cross taping, kinesiology taping and sham group to be evaluated. The same pattern can be observed from horse subjects where the sample size varies in both studies. The common criterion involved was the subjects were all injured and have medical history.

Another criteria involved in this review also varied depending on the purpose of research. In a research conducted by (G.S Nunes, 2015), it is the only research where the age had not been the criteria needed. The criterion involved was that the injury occurred between 48-96 hours before the kinesiology tape can be applied. Other than that, the researches involved the patients who aged above 18 years old because they able to understand the purpose of the researches been conducted. In horses, the research focused on observing the trajectory of their limb and reducing the swelling through kinesiology tape application.

Function

Applying kinesiology tape (KT) increased the gait ability for chronic stroke patients with foot drop (Y.J Shin, 2018). KT also showed consistent result in proving its effectiveness for unstable ankle where their gaits shown significant difference according to (C.T Domingo, 2015).

In another study, it proposed that both tensioned and non-tensioned taping across the upper trapezius muscle reduced the activity during standardized typing task on healthy patients were aligned with previous reaches done previously (A.M El-Abd, 2017). In a study by (A.Makeeva, 2016), the case number of pain decreased proving that KT do have positive effects but due to small sample size, the results were not as reliable as the study conducted by (T.Halski, 2015).

The study proved that KT able to reduce pain sensation, which had been studied in many previous researches compared to cross-taping and sham group.

A study conducted by (F.Qafarizadeh, 2016), stated that KT improved the gross and hand function plus it provided favorable effects to the patients as it able to improve the manual dexterity. (H.Goksu, 2016) stated that kinesiology tape had shown great function when it managed to improve the range of motion of the patient's shoulder along with its function but it was after with the help of local injection as they had the healing power more compared to KT. On the other hand, there was also research that contradicted the effect of KT, saying that KT were not effective in reducing acute swelling after an ankle sprain in athletes (G.S Nunes, 2015).

As for equine, the kinesiology taping used to test whether it can increase muscle activity and increase the stride length and the arc of hoof flight of the horse based on a study conducted by (A.Zellner, 2017). In this study, the author explained that though there was no significant difference after applying the tape, but it provided positive effect because it increased the muscle strength and muscle activity.

In another study conducted by(L.H.L Mattos, 2017), therapeutic bandaging using kinesiology tape enhance the local lymphatic activation and prevent the side effects of joint capsule distension and subcutaneous tissues. Besides that, this study also stated that kinesiology taping created convolutions due to recoil of tape itself hence promoting skin lifting that created more space and promoting the liquid passageway better.

Limitation of Kinesiology Tape

Though kinesiology tape shown most of its effectiveness, but it still had several limitations that need to be considered of. Most of the studies mentioned about getting bigger sample size (F.Qafarizadeh, 2016), (A.Makeeva, 2016),(Y.Artici, 2017) and (T.Halski, 2015).

Limitations in another study by (A.M El-Abd, 2017) and(C.T Domingo, 2015)proposed that a following up process is necessary to find out longer term of kinesiology taping effect.

Besides that, it also suggests to combine few interventions of kinesiology tape with other tapes to have better understanding in effectiveness of kinesiology taping. Another study with same limitation was by (G.S Nunes, 2015), suggested that the application of KT should be applied for more than 3 days and at different phase of inflammatory process so that the longer term effect can be investigated.

Other study by (H.Shakeri, 2018) suggested that kinesiology tape's effect should involve pain-free grip measurement instead of average 3 grip measurements. (H.Goksu, 2016) mentioned the limitation in the study was the absence of sham injection to compare the effect of kinesiology tape. Another suggestion made in this study was to compare the local injection with kinesiology taping.

In another study by (S.Balki, 2016), the use of different types grafting limited the effect of kinesiology taping which make it hard to be determined in the study. Besides that, the tape had limit to the capacity of the tension and it might have therapeutically effect in placebo group (Y.Artici, 2017).

Another study by (Y.J Shin, 2018) suggested having more studies on comparing the kinesiology tape with AFO and FES, methods in decreasing ankle drop in human athletes. In a study by (F.Qafarizadeh, 2016) which suggested that when applying KT on human athlete, the dominant paresis of certain part involved should be taken into account as it can affect the result in the research.

A study by (A.Zellner, 2017) suggested that there should be more studies on horses especially in investigating the effect of KT for relieving pain, improving the blood and lymph flow, increase proprioception, realigning fascial tissue function, and relieving muscle spasm physiologically and therapeutically.

More studies need to be conducted in investigating the effect of kinesiology taping on animal especially in horse due to the limitation of data in this area, which could be a great help in veterinary medicine (L.H.L Mattos, 2017).

CONCLUSION

This review showed that the application of KTdoes improve the performance in both human and non-human. Besides that, KT also reduce pain intensity, increase range of motion and a good muscle spasm reliever. KT used in horses able to improve their strides length and hoof arc making them to perform better whether in competition or in daily exercise.

KT can make a good choice of non-invasive rehabilitation. Through active research and rigorous investigations, the importance of KT should be explored more in human or non-human. KT effectiveness can be proved through bigger sample size of subjects and longer period of research to prove the duration of effectiveness.

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