

The Benefits of Kinesiotaping in Physical Activity Practitioners: Integrative Review

Os Benefícios do Kinesiotaping em Praticantes de Atividade Física: Revisão Integrativa

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Abstract

The practice of physical activity results in physical, mental, social and important health benefits by preventing diseases, for which motor skills are needed and there are some factors such as large ranges of motion, physical contact, muscle tension that are exerted during physical practice that can cause significant injuries. Injury prevention in physical activity practitioners or athletes includes identifying modifiable risk factors, offering effective preventive training programs and establishing safe criteria to return to sport. With the advancement of technology to rehabilitate athletes, physical therapy has used the method of using taping to improve the function of the extremities and correct muscle imbalances that could lead to possible withdrawal from their activities. The objective was to identify the benefits of applying the kinesiotaping method in individuals who practice physical activity. A search was carried out in the Pubmed, Web Science, Scielo indexes, and the research period was from July to August 2022. 15 articles resulted which were read in full to compose this integrative review. The study showed different forms of taping application in physical activity practitioners, whether for rehabilitation or injury prevention.

Keywords: Exercise. Athletic Tape. Health Promotion.

Resumo

A prática da atividade física resulta em benefícios físicos, mentais, sociais e importante para saúde prevenindo doenças, para isso são necessárias habilidades motoras e existem alguns fatores como grandes amplitudes de movimentos, contato físico, tensão muscular que são exercidas durante a prática física que podem ocasionar lesões significativas. A prevenção de lesões em praticantes de atividade física ou atletas inclui identificar fatores de risco modificáveis, oferecer programas de treinamento preventivo eficazes e estabelecer critérios seguros de retorno ao esporte. Com o avanço da tecnologia para reabilitar atletas, a fisioterapia tem utilizado o método do uso de taping para melhorar a função das extremidades e corrigir desequilíbrios musculares que poderiam levar a possíveis afastamento de suas atividades. O objetivo do estudo foi identificar os benefícios da aplicação do método kinesiotaping em indivíduos que praticam atividade física. Realizou-se uma pesquisa nos indexadores Pubmed, Web Science, Scielo, o período de busca foi de julho a agosto de 2022 artigos nos idiomas inglês e português. Resultaram 15 artigos lidos na íntegra que compuseram esta revisão integrativa. O estudo mostrou diversas formas de aplicação do taping em praticantes de atividade física sendo para reabilitação ou para prevenção de lesões.

Palavras-chave: Exercício Físico. Bandagem Elástica. Promoção em Saúde.

1 Introduction

According to Paffebarger¹ physical activity is defined, when the body produces some movement of the skeletal muscle system that results in energy expenditure greater than the rest levels. Physical exercise is a planned, structured and repetitive physical activity with the objective of improving physical fitness; physical exercise is not synonymous with physical activity, but it is a subcategory of physical activity. Therefore, for the individual to practice physical activity, the skeletal muscle system needs to present mobility, flexibility, proprioception, balance and without pain stimuli.

The practice of physical activity results in physical, mental, social and important health benefits by preventing diseases, for which motor skills are needed and there are some factors such as large ranges of motion, physical contact,

muscle tension that are exerted during physical practice that can cause significant injuries. The injury can be defined as an injury to the human body that exceeds the threshold of physiological tolerance that occurs between the player and the environment during the practice of physical activity that can be competitive or recreational, causing physical disability resulting in the removal of the participation of future practices for a determined time depending on the degree of injury⁴. Data on the epidemiology of injuries show that 96 types of injuries identified in 87 soccer players, with the most prevalent being muscle injuries with 36%, joint 34% physical contact the main mechanism of injury⁵. Another data on athletes taking part in ultra-marathon around 50% presents injuries, with ankle and knee affected⁶.

Injury prevention in physical activity practitioners or athletes includes identifying modifiable risk factors, offering

effective preventive training programs and establishing safe criteria to return to sport. Several programs are used to prevent injury developed by health professionals with the combination of strength training, agility, flexibility exercises, balance, neuro-muscular exercises⁷. With the advancement of technology to rehabilitate athletes, physical therapy has used the method of using taping to improve the function of the extremities and correct muscle imbalances that could lead to possible injuries.

Kinesiotaping (KT), developed by Kase in 1973, is the most common elastic taping technique used to prevent sports injuries, rehabilitate injured athletes, and improve muscle performance. Currently KT is being intensively used by athletes, physiotherapists, researchers and rehabilitation team members⁹. The effects of kinesiotaping on the musculoskeletal system are hypothesized with pain reduction, proprioception improvement, support for joint misalignment, muscle function activation or inhibition¹⁰. There are controversies of KT action in acute and chronic algias with positive results and some studies point to a placebo effect¹¹. The combination of KT with rehabilitation therapies with exercises helps to improve pain, enabling the individual to return his or her activities more quickly¹². In the literature review, it was observed that studies showed advantages in the use of kinesiotaping combined with other therapies in the control of pain in subacromial pain syndrome¹³. The physiology of KT's performance is not well clarified, researchers have demonstrated that KT affects inflammation in a cascade and events, increasing blood and lymphatic circulation, thus stimulating movement through intense muscle contraction, reducing pain by reducing pressure on subcutaneous nociceptors and facilitating movement in joints and muscles⁹. Studies have shown that kinesiotaping tape has a positive influence on athletic performance in lower limb strength and neuromuscular function, others report that it has no effect on muscle strength and range of motion in knee of healthy individuals¹⁴.

The technique is widely used by health professionals during rehabilitation, few studies that provide information that underlie the use of this type of technique in the treatment or prevention of practitioners of physical activity or sport, therefore, the objective of this study is to identify the benefits of the application of the kinesiotaping method in individuals who practice physical activity through an integrative review.

2 Material and Methods

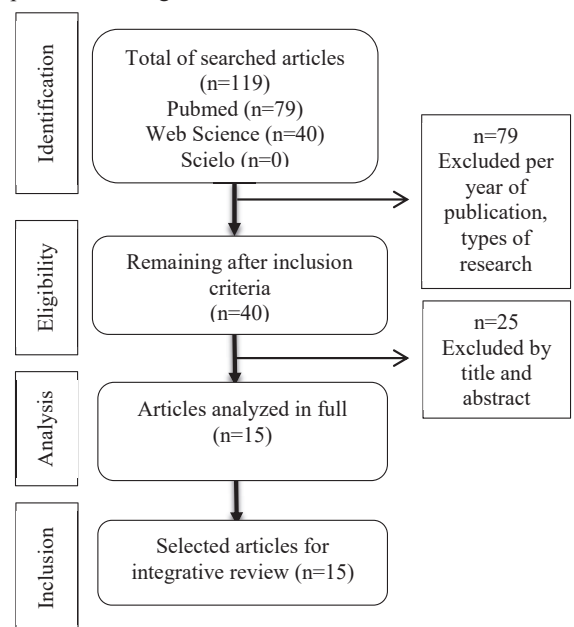
This is an integrative review guided by 6 stages: definition of the theme, selection of the research issue “What are the effects of kinesiotaping on individuals who practice physical activity?”; establishment of inclusion and exclusion criteria; identification of pre-selected and selected studies; categorization of selected studies; analysis and interpretation of results and presentation of the review/synthesis of knowledge¹⁵. This method aims to gather and

synthesize research results on a particular topic or issue in an orderly and systematic manner, contributing to the deepening of knowledge of the subject examined¹⁶. This review aimed to identify intervention studies with the application of kinesiotaping in individuals who practice physical activity. A research was carried out in the PubMed, Web of Science, SciELO indexers, the search period was from July to August 2022. The descriptors used for the search in Portuguese (*bandagem elástica, atividade física, atletas, futebol, futsal, tenis, corrida*) and in English (kinesiotaping, athletic, tennis, runner, soccer, exercise) combining the AND and or Boolean operators.

Only articles available on the web, in Portuguese, English, Spanish and published in the period from 2017 to 2022 were considered for this review. The inclusion criteria used were longitudinal studies, control case studies, case studies, experimental and cohort studies, randomized and non-randomized studies, and included articles with a sample composed of individuals who practiced some physical activity or sport. The exclusion criteria used were studies that did not involve KT as a proposal of the study objective.

During the search 119 articles were found, being 79 in Pubmed, 40 Web of science and none in SciELO, all of which were to be included in this integrative review. In Figure 1, the flowchart of the survey steps in the databases and the number of selected articles are more detailed.

Figure 1 - Flowchart of the steps of the article selection process for integrative review



Source: resource data.

3 Results and Discussion

Based on the research in the databases chosen and the descriptors in English and Portuguese, the Boolean operators AND or were used to combine the descriptors in the search. A total of 119 studies were found and soon after followed

the selection of studies that met the inclusion and exclusion criteria, of which 79 articles were excluded. Next, there were 40 articles left for reading the title, and 25 articles excluded because they were out of the theme and resulted in 15 articles read in full to compose this integrative review. Next, Table

1 will specify the information about the selected studies, containing authors, year of publication, research design, sample and then Table 2 the information about the objective, result and conclusion. Table 3 describes the intervention of each article analyzed.

Table 1 - analyzed articles for integrative review of 2022

Author/Date	Research	Sample
Alahmari et.al. ⁷	Placebo controlled randomized study G. with kinesiotaping G. placebo	66 athletes with mechanical cervical pain
Allois et al. ¹⁸	Randomized controlled study Experimental group taping (n=19) Control Group (n=19)	38 male soccer players were recruited from the Federazione Italiana Giuoco Calcio in Turin
Alrawaili ¹⁹	Prospective cohort study	16 male soccer players
Brogden et al. ²⁰	Randomized crossover G1 - no tape (NT), G2 - RockTape™ (RT) G3 - Kinesio™ Tape (KT)	11 professional male soccer players
Espi-López et al. ²¹	Randomized controlled study in 3 groups: G. Sham + KT G. (SKT) + BE, Kinesiotaping G. (KT)+ BE and Kinesiotaping in isolation.	46 male amateur soccer players from a soccer club
Esposito et al. ²²	A cross-sectional, placebo-controlled randomized study, single-blind G.taping G. without taping G placebo	15 semi-pro soccer players
Fereydownnia, Shadmehr ²³	Controlled randomized study G. with instability »G. without instability	15 men with knee functional instability (IFA)
Kim, Kim. ²⁴	Randomized controlled study G.Kinesiotaping (20) – KTSE G. Sham Tappe (20) SKTE	40 adult softball players
Kim, Park ²⁵	A comparison inside the subject	24 healthy athletes elite college students
Kuyucu et al. ²⁶	Controlled prospective study G. kinesiotaping (11) G. placebo (11)	22 juniors football players who were diagnosed with apophysitis of the calcaneus
Lee ²⁷	Case study	1 goalkeeper
Lee, Lee ²⁸	Case study	1 amateur 25-year-old college football player with pain in the medial area of the knee
Lin et al. ²⁹	Controlled randomized study. Ankle group (11) AB Kinesiotaping group (11) KT Control group (11)	Athletes (N=33) with ankle functional instability (IFA) Ankle group (11) AB Kinesiotaping group (11) KT Control group (11)
Mendez et al. ³⁰	Pilot study	12 male athletes (n = 6), basketball (n = 3) and football (n = 3)
Romero et al. ³¹	Cross-sectional pilot study	A total sample of 38 healthy individuals of male elite football players (n=18) and group B consisting of elite basketball players (n =20)

Source: research data.

Table 2 – Information on the objective, result and conclusion of the articles analyzed in the integrative review of 2022

Author/Date	Objective	Result	Conclusion
Alahmari et.al. ¹⁷ 2020	Compare the effects of Kinesio™tape application versus placebo application on cervical proprioception in athletes with mechanical cervical pain.	In the articular position group by time interaction was statistically significant for flexion, extension and right rotation. Kinesiotaping had significant improvement in terms of decreased joint position errors in flexion, extension, left rotation and right rotation in relation to group-by-time interaction was statistically significant for EVA from tape application	The Kinesio™tape group presented statistically significant improvements in relation to the reduction of joint position errors and pain levels after 3 days and 7 days of tape application in comparison with the placebo group.

Author/Date	Objective	Result	Conclusion
Allois et al. ¹⁸ 2021	To evaluate the effectiveness of a program of fascial therapy and strength training, combined with kinesiotaping, in improving the range of motion, pain, strength and ankle stability in soccer players with recurrent sprains.	Statistically significant in the experimental group on ankle mobility, strength and stability. The control group presented improvement in all variables of the study.	Myofascial therapy and strength training together with kinesiotaping can improve perceived pain, mobility and ankle strength in recurrent ankle football players.
Alrawaili ¹⁹ 2019	To investigate the impact of KT on muscle performance in healthy young soccer players	They found no significant differences among players in any of the three, conditions and no significant changes were observed among the three states after the evaluations	KT has no beneficial impact on muscle performance in young healthy soccer players.
Brogden et al. ²⁰ 2018	To investigate the effects of different variations of therapeutic elastic taping (TET) in tests used to track the risk and function of ankle injury	Significant improvements in the joint position sense of the final amplitude. When compared to NT, RT significantly ($P = 0.02$) improved the medium articular position sense. No significant differences were observed for the measures of postural stability or for the variables of soil reaction force.	TET helped improve performance in a series of clinical and functional tests, highlighting possible implications for injury prevention and management in a healthy male soccer population
Espí-López et al. ²¹ 2020	To determine the effects of KT's application as a prevention tool in terms of achieving functional knee correction, in isolation and in combination with BE, on parameters related to ankle stability, such as dynamic balance, balance and flexibility in amateur soccer players.	Both SKT + BE and KT + BE groups achieved significant improvements in pre-post in SEBT, unipodal support test and toe touch test. The KT group presented significant intra-group differences only in the unipodal support test variable. The sham KT group obtained the strongest results in all the physical variables. Regarding the Knee injury and Osteoarthritis Outcome Score, significant pre-post changes were found in the sham group	The study showed that there are benefits of knee function taping in amateur soccer players.
Esposito et al. ²¹ 2021	To investigate possible beneficial effects of KT on performance balance in healthy individuals, male semi-professional football players using both male semi-professional soccer players using as soccer players	No significant differences were found between test conditions for all the investigated parameters ($P > 0.05$)	KT was not effective in improving static and dynamic balance, with no significant difference when compared to conditions without tape and placebo. This may suggest that KT should not be used when the goal is to improve balance in healthy players com focus on preventing ankle injuries.
Fereydounnia ²³ et al 2019	To compare the immediate effects of two Kinesio taping methods (from distal taping muscular application on long fibular) and proximal-distal taping (muscular application on medium and long fibular gluteus in muscular strength, functional performance and balance in athletes with and without ankle functional instability	There were significant differences for the effect of the factor in all outcome measures ($P < 0.05$), except for the figure of the 8 hop test. No significant differences were observed for group effects and group-by-factor interaction effects ($P > 0.05$), except for the lateral leap test.	KT had immediate effects on improving strength, performance, and balance. However, there were no differences in the method of application. Clinicians may consider applying Kinesio taping during the rehabilitation process of athletes with IFA, to improve balance and strength.
Kim, Kim ²⁴ 2022	To investigate the effect of Kinesio taping with squat exercise (KTSE) on lower extremity muscle activity, muscle strength, muscle tone and dynamic stability of softball players.	Both groups presented significant differences in lower limbs muscle activity, muscle strength, muscular tonus and dynamic stability ($p < 0.05$). After the experiment, significant effects on lower limbs muscle activity, muscle strength, tonus muscular and dynamic stability were observed in the KTSE group in comparison with the SKTSE group ($p < 0.05$).	KTSE had a more significant effect on lower limbs muscle activity, muscle strength, muscle tension and dynamic stability than SKTSE. Therefore, KTSE can be considered as a program to increase the role of lower limbs when planning a training program for softball players

Author/Date	Objective	Result	Conclusion
Kim and Kim ²⁴ . 2017	To evaluate the short-term effects of sports taping applied at the lower part of the support leg in elite athletes by evaluating the navicular height	During the session, the normalized NH of RT is greater than that of NT, KT and PT while during the running, the normalized NH of RT is greater than that of NT and PT. The PP of NT normalized peak is greater than the PT in the lateral region of the midfoot	This study showed that the RT technique (hard taping) maintained the NH (navicular height) during sitting and running. Based on these results, the RT technique can be an effective prevention and treatment strategy for MTSS.
Kuyucu et al. ²⁶ 2017	To study athletes with apophysitis of the calcaneus to evaluate the efficacy of kinesiotherapy, which we consider to be a potential alternative to the approach of arch banding described previously	Comparing kinesio and sham taping groups, they did not show significant differences in relation to EVA scores and AOFAS scores. The Sham group presented significant increases in the AOFAS scores of the 1 st month, 3 rd month and 6 th month compared to the AOFAS score, pre-treatment. The kinesio group presented AOFAS scores significantly higher than the 1 st and 3 rd month in relation to the sham group.	Kinesiotherapy was an effective treatment modality to reduce pain compared to placebo in patients with calcaneus apophysitis. Kinesio taping was significantly more effective than placebo when functional ankle and foot scores were considered.
Lee ²⁷ 2020	To investigate the short-term effects of ankle eversion banding (AET) using kinesiology tape in bilateral acute ankle inversion sprains in an amateur college soccer goalkeeper	The subject had an ankle score of 41%; visual analogue scale (EVA) of 5/10 and 7/10 for the right and left ankles, respectively; functional and patient-specific pain scale (PSFS) of 12/50; and limited ankle range of motion. Swelling disappeared after AET in both ankles. In the weight-bearing test, the right and left ankle distances increased from 2 cm to 12 cm and from 0 cm to 12 cm, respectively.	The data presented in this case report seem to prove that this intervention was a successful method of treatment, but there is no scientific evidence that this method will be a successful clinical treatment in all cases of acute ankle inversion.
Lee . Lee ²⁸ 2018	To investigate the effects of balance taping on muscle injury of hamstrings and traumatic knee pain suffered by an amateur college soccer player as a result of a soccer match	» Tegner's Activity Scale Level increased from 3 to 9 after the balance recording, indicating increased activity capacity. The VAS scores for pain in the medial area of the knee and hamstrings during knee flexion decreased from 6 and 5 to 0 and 0, respectively.	Balance tape is an effective treatment for soccer players with muscle injury in hamstrings and traumatic pain in the knee.
Lin et al. ²⁹ 2020	To investigate the effects of two common ankle supports, including the ankle and Kinesio tape (ankle orthosis versus Kinesio tape) on post-fatigue landing performance in athletes with ankle instability	A significant increase in the peak vertical reaction force of the soil (vGRF) was found in the AB group (0.12% of body weight (CP)) compared to the KT group (0.02% CP) . Significant decrease in both medial-lateral (ML) and anteroposterior COP intervals	The results show that the ankles can inhibit the ability of the ankle joint to dissipate the impact force and thus predispose athletes to secondary injuries. On the other hand, Kinesio tape can provide better postural control for dynamic landing of later matches or training exercises.
Mendez-Rebolledo ³⁰ 2018	To analyze the effects of KT (24 and 72 h) on the height and reaction force of the soil (propulsion phase) during vertical jump, as well as muscle latency of the trunk and lower limbs and recruitment order.	Kinesio taping did not take effect after 24 hours in both countermovement and squatting jump. However, at 72 hours, kinesio taping increased the height of the jump (P = 0.02; d = 0.36) and normalized the soil reaction force (P = 0.001; d = 0.45) during the countermovement jump. In addition, the 72-hour taping kinesio reduced the onset latency of longissimus (P = 0.03; d = 1.34) and improved the order of muscle recruitment during a countermovement jump.	These findings suggest that kinesio taping can improve neuromuscular and kinetic performance during a countermovement jump only after 72 hours of application in healthy and non-injured male athletes. However, no change was observed in a squat jump
Romero et al. ³¹ 2020	To investigate in elite soccer and basketball players U18 the effectiveness of ankle banding in reducing ADM ankle dorsiflexion and inter-member asymmetries throughout the training session	For the soccer group, significant differences were observed (p < 0.05) for the right ankle, but no difference for the asymmetry variable. The basketball group reported significant differences (p < 0. 05) for the right ankle and symmetry	Ankle banding reduced the ADM of ankle dorsiflexion in elite soccer and basketball players

Source: research data.

Table 3 – Description of the intervention of the analyzed articles of the integrative review of 2022

Author/Date	Intervention
Alahmari et al. ¹⁷ 2020	The Kinesio™ tape group received standard Kinesio™ tape applications with adequate tension, while the placebo group received stress-free tape applications.
Allois et al. ¹⁸ , 2021	Each player has received two weekly 50-minute sessions for a 4-week period. The players included in the experimental group received intervention using myofascial techniques, eccentric training and neuromuscular taping. The control group received the same intervention without taping.
Alrawaili ¹⁹ , 2019	KT was applied in three conditions: without tape, immediately after KT application, and 8 hours after KT application. Muscle performance exercises were performed
Brogden et al. ²⁰ 2018	Players performed a ten-minute standardized warm-up protocol consisting of multi-directional running exercises and dynamic stretching of lower-limb muscles flexibility.
Espí-López et al. ²¹ 2020	The intervention period lasted 4 weeks. Three evaluations were carried out: on the baseline (pre), at 2 weeks (middle) and at 4 weeks after treatment (post).
Esposito et al. ²² 2021	The participants performed static and dynamic balance tests with the dominant leg. Each participant performed both tasks in three conditions; tape, without tape and placebo tape.
Fereydounnia et al. ²³ 2019	Participants made distal application of Kinesio taping and proximal-distal application of Kinesio tape in the first sessions and afterwards test of muscular strength, performance and balance
Kim, Kim ²⁴ 2022	The Kinesio group carried out KT with squatting. The SKTSE group performed simulated KT with SE. The two groups performed activity for 30 min/day, three times a week, for 6 weeks, that is, a total of 18 times throughout the study period. In both KT was applied every 48 h, the muscle activity of the lower limbs, muscle strength and muscle tonus of the lower limbs were evaluated.
Kim, Park ²⁵ 2017	The 4 taping conditions were used: rigid taping (RT), kinesiology banding (KT), placebo banding (PT) and non-taping (NT). The normalized navicular height (NH), normalized ND, was evaluated, they were instructed to sit, stand up, walk, and play, in order We used 4 taping conditions: rigid tape (RT), taping (KT), placebo taping (PT); and without tape (NT)
Kuyucu et al. ²⁶ 2017	All participants were completely randomized, with one group being submitted to kinesio taping and the other form of kinesio taping that imitated the kinesio taping, but without the properties of the kinesio taping (sham). In both groups, stretching exercises, topical analgesic treatment and simulated massage therapy were applied to the heel and plantar fascia.
Lee ²⁷ 2020	The ankle eversion taping was applied for two weeks (average 16 h/day) in a 24-year-old goalkeeper with bilateral ankle inversion degree 2 with swelling (more severe left ankle) during a soccer match.
Lee, Lee ²⁸ 2018	The tape was used for 1.5 months (mean, 16 h/d). With the subject standing, the KT left the anterior part of the thigh, in the central part of the distal third of the femur and progressed, with approximately 70% tension, toward the area part of the gastrocnemius muscle without external tension, it was applied from the patella toward both proximal tibiae in horseshoe shape with kinesiotaping.
Lin et al. ²⁹ 2020	The AB and KT groups were applied to the affected leg, respectively, in the fatigue protocol and in the post-fatigue tasks. The subjects underwent unipodal lateral drop before and after the fatigue protocol with the leg involved. KT, respectively, in the fatigue protocol and post-fatigue tasks.
Mendez,Rebolledo et al. ³⁰ 2018	A single squat and countermovement jump in the basal time (without kinesio taping), 24, and 72 hours of application of kinesio taping in the maximum gluteus, femoral biceps, femoral rectum, medial and long gastrocnemius and normalized soil reaction.
Romero- Morales ³¹ et al. 2020	The training session, in which the subjects were evaluated in both groups, consisted of a 90 technical session After that, the ADM was evaluated of ankle dorsiflexion in the position of weight support in three moments: (1) without tape, (2) before practice and (3) immediately after practice.

Source: research data.

Fifteen articles were analyzed between 2017 and 2022, totaling a sample of 377 individuals practicing sport, and soccer was the most cited sport. Most of the articles had the body structure studied, followed by the knee, thigh muscles, heel and a cervical article only¹⁷. Corroborating the studies, it is evident that the injuries most affected by soccer players are ankle sprains, followed by hip, groin, and knee.

In the total of the selected articles, eight were controlled and randomized studies^{17,18,20-24,29} comparing the effect of KT with the placebo group, combined with other techniques of rehabilitation and different types of taping.

The interventions performed were not standardized, the articles that mentioned the way of application presented “I” or “Y” shape. The tension applied to the body structure did not present a consensus, with a lower tension of 10 %

27 and a higher tension of 50% and 75%^{24,28}. In all studies, the application technique was performed by a skilled and experienced professional.

Another relevant fact is that the selected articles had heterogeneity in the measurement variables and tools, Alahmari¹⁷, evaluated the cervical articular position in flexion, extension, right and left rotation using a device that measures the range of motion (ADM) at the top of the head and the visual analogue scale (EVA). Ankle stability was the most studied variable, Allois¹⁸ used myofascial techniques, eccentric training combining the application of KT in the ankle and comparing it with the placebo group, ADM was measured in the dorsiflexion and plantar ankle with digital goniometer, isometric strength with digital dynamometer, stability with Biodex apparatus, and EVA for pain. Brogden’s

study²⁰ investigated the effects of different types of taping for ankle injury and used the articular position variables with isokinetic dynamometer, postural stability with Biodex apparatus, soil reaction force on a strength platform. After a battery of exercises, KT was applied in the group (KT), and the other type of taping in the group (RT) and control group (NT). The Esposito study²² investigated the possible effects of KT on the static and dynamic balance measured on the strength platform, under conditions with KT, without KT and placebo. In the case study of Lee²⁷, the application of KT was for bilateral ankle sprains, which presented pain, the reduced ADM was evaluated as the distance from the wall to the first toe, the edema at the site was evaluated in a centimeter (cm) to measure eight and applied to the functional scale (PSFS). The pilot study by Romero²¹ investigated after the training session in athletes with KT, the reduction of ankle ADM, in dorsiflexion through the Dorsiflex 2.0 application, installed on iPhone 8. However, LIN²⁸ evaluated the ankle in the unipodal lateral drop on a 30-centimeter platform and another force platform in the soil.

In relation to the lower muscle group, Fereydounia²³ investigates the KT's performance in ankle instability, in relation to the muscular strength of hip abductor, ankle evertors with a portable dynamometer and evaluated the functional performance, balance with lateral leap test. Kim²⁴, in order to evaluate the short-term effects of the KT on the support leg, evaluated the navicular height, using the technology of a 19-camera motion capture system (Oqus, Qualisys), measured the length of the foot perpendicular distance from the first metatarsophalangeal joint to the posterior aspect of the heel. The pilot study by Mendez³⁰ observed the short-term effect of KT on the muscular recruitment of quadriceps and long-term muscles with electromyography device, strength platform. Whereas another similar cohort study, Alrawaili¹⁹ evaluated the effect of KT on quadriceps and hamstrings muscular performance with isokinetic dynamometer in two stages: immediately after the KT application and 8 hours after the athletes performed concentric and eccentric muscular effort of the studied muscle group. Espiz-Lopez²¹ used the static and dynamic balance test, the lumbar flexibility test and the Knee injury and Osteoarthritis Outcome Score (KOOS) questionnaire, which evaluates functional disability.

In the knee structure, Kim²⁵ performed electromyography in muscle activity, for muscle strength he used the digital dynamometer, and in muscle tension MyotonPRO was used. Kuyucu's study²⁶ reports the efficacy of KT in apophysitis of calcaneus not using any technology, but the scale (EVA) and the scale of American Orthopedic Foot-Ankle Society (AOFAS), in the period of the 1st week and the 3rd 6th month of KT application. Unlike all Lee²⁸ in his case study investigated the effect of KT on muscle injury of hamstrings and traumatic knee pain, its variables were Tegner's activity scale and the scale of (EVA).

The fifteen articles reviewed, eight articles presented a

statistically significant outcome ($P < 0.05$) and seven did not obtain significant results ($P > 0.05$). We can see a divergence of the results presented.

The results of the articles presented several outcomes in relation to statistically significant data ($P < 0.05$), Alahmari¹⁷ obtained the result of KT presented significant improvements in relation to joint ankle reduction and pain level after three and seven days of application in comparison to the groups. Espi-Lopez²¹ the KT group in the knee associated with balancing exercise presented improvements in the balance and flexibility test. Studies by Kim²⁴ and Allois¹⁸ were significant in lower limbs muscle activity, muscle strength, muscle tension and dynamic stability compared to other types of taping. Whereas Kuyucu²⁸ had only significant scores in (AOFAS) in relation to the placebo group. The pilot study of Mendez³⁰ resulted that the 72-hour KT in the ankle reduced the onset latency of the long and improved the order of muscle recruitment during a countermovement jump. A study by Brogden²⁰ showed improvements in the articular position sense of the final ankle amplitude, compared to the KT group and the other banding group, but no differences were observed for other variables. In Fereydounia²³ the result was significant for all the outcome measures, in the application of KT at the ankle, but there was no significant difference for the effects of the interaction group.

In relation to the articles that did not obtain significant results, ($P > 0.05$), Alrawaili's study¹⁹ did not find differences among the players after the immediate application of KT and 8 hours after. Esposito²² found no differences between the taping group and the placebo group of soccer players in the application of KT in the ankle. Kim²⁵ and Lin²⁹ in their comparative studies of KT and other taping technique did not present positive results, but concluded that the use of KT is an effective strategy of postural control for dynamic landing and injury prevention. The two case studies of Lee²⁷ Lee²⁸ as soccer players, one with ischiotibial and knee injuries and the other on the ankle showed improvement in pain in the injury site but they were not statistically significant because the sample was unique.

4 Conclusion

The application of kinesiotaping in rehabilitation and/or injury prevention brings benefits in practitioners of physical activities. The study elucidates the various forms of application of kinesiotaping, with varying results depending on the objective of the application.

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