



Is Kinesio Taping Effective for Sport Performance and Ankle Function of Athletes with Chronic Ankle Instability (CAI)? A Systematic Review and Meta-Analysis

Biz C, et al. Medicina. 2022; 58(5): 620

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Date: 2022.06.29

Outline

1. Background
2. PICO
3. Critical appraisal
4. CASP 系統性文獻回顧檢核表



Background

- **Chronic ankle instability (CAI)** is the process caused by repetitive ankle sprains and multiple episodes of the ankle “giving way” with persistent symptoms.

Sports Med. 2014, 44, 1545–1556J; Athl.Train. 2019, 54, 603–610

- The prevalence of CAI in a population with a history of ankle injuries is **46%**, ranging from 9 to 76%.

Foot Ankle Res. 2021, 14, 41

- **Women** and **young** people are more likely to develop ankle injuries and CAI.

Sports Med. 2007, 37, 73–94; Med. Sci. Sports Exerc. 1999, 31, 1807–1812



Risk factors of Chronic ankle instability



proprioceptive deficit

ligament laxity

muscle weakness :peroneus brevis & longus

delayed neuromuscular activation

loss of static and dynamic balance

High BMI, participation in sports



increased talar curvature & not using external supports

Knee Surg. Sports Traumatol. Arthrosc. 2020, 28, 1600–1610.
J. Orthop. Sports Phys. Ther. 2013, 43, A1–A40.



臨床問題 肌內效貼布可改善慢性腳踝扭傷運動員的動作表現嗎?

問題/研究族群 P roblem/Patient	Recurrent sprains can lead to a condition of chronic ankle instability (CAI)
給予的措施 I ntervention	Kinesio Taping
對照組 C omparison	Athletic-taped, control, ankle brace, bandaging
結果 O utcome	<ul style="list-style-type: none">➤ Gait Functions➤ Ankle Joint ROM➤ Muscle Contraction➤ Postural Sway during Movement➤ Dynamic Balance➤ Lateral landing from a monopodal drop➤ Agility





CRITICAL APPRAISAL

- **Methods**
- **Results**
- **Discussion**



Methods

- The following string was used
 - (“kinesiology tape” OR “tape” OR “taping” OR “elastic taping” OR “kinesio taping” OR “kinesiotape” OR “neuro taping”) AND
 - (unstable OR instability) AND
 - ankle OR (ankle OR “ankle sprain” OR “injured ankle” OR “ankle injury”)
- Publication date: 2010 to December 2021
- PubMed, Scopus and Web of Science
- A language filter was also applied, searching in English only.

Methods

Inclusion criteria

1. English and designed as original studies
2. RCT, cohort studies, case-control studies and case series
3. ≥ 18 y/o
4. diagnosis of chronic ankle instability (CAI)
5. athletes
6. at least one intervention group & one group who had KT applied to their ankle; at least one ankle function was analysed

Exclusion criteria

1. non-athletic patients
2. underwent ankle surgery or had an ankle fracture of at least 6M
3. Non-English-language articles,
4. review articles, meta-analyses, editorials, letters, comments, conference abstracts or case reports, non-full-text articles



Results

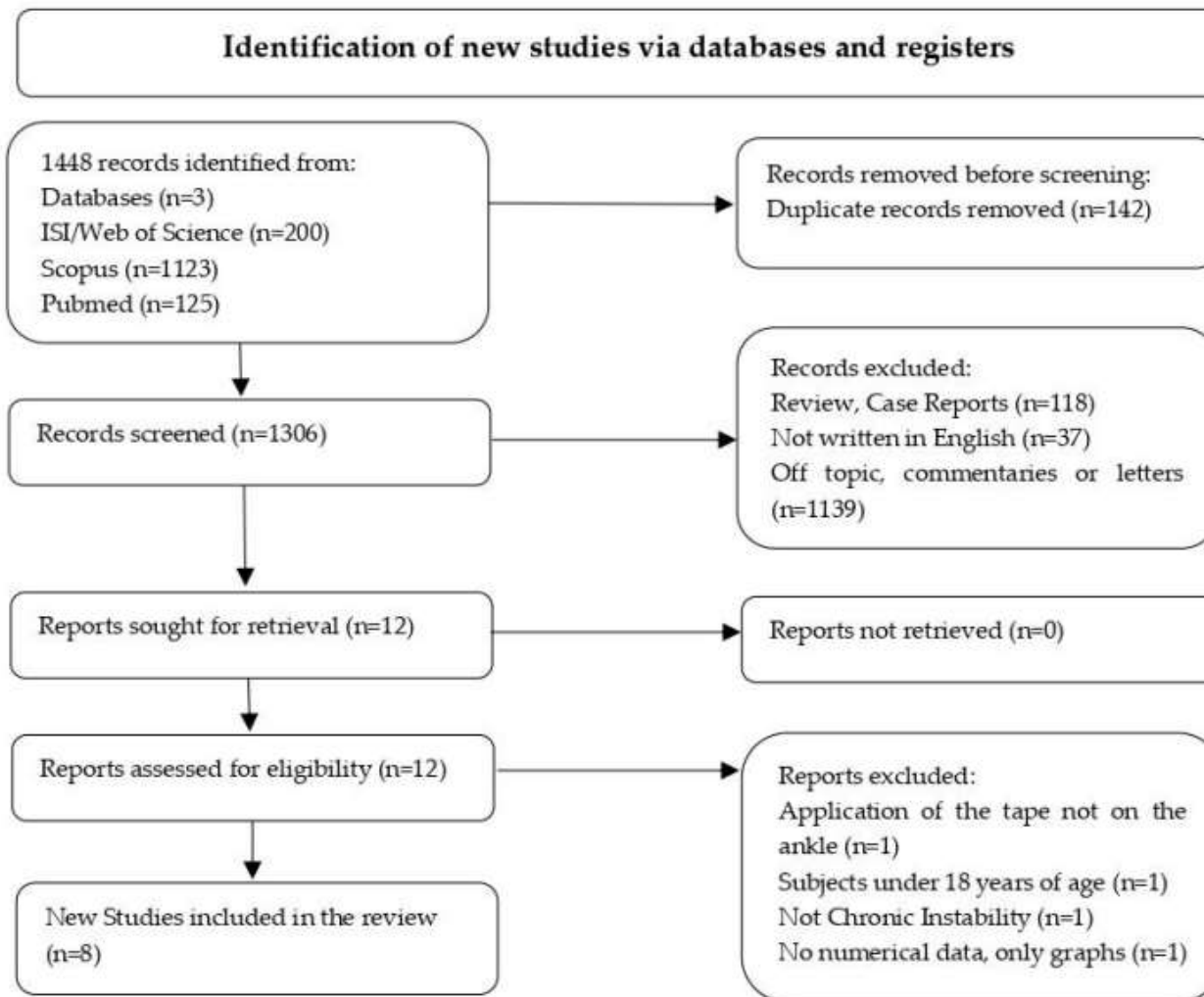


Figure 1. Systematic Reviews and Meta-Analyses (PRISMA) flow chart showing the process for inclusion of papers. For this study, 14 articles were assessed for eligibility after screening: among these, 8 new studies were included in the analysis [41].

Table 1. Study Characteristics.

Author (Publication Year)	Type of Study	Level of Evidence	<i>n</i> (m/f)	Age (Years *)	Sport
Kim et al. (2017) [48]	Cross-Over Randomised Design	I	22 (m)	17.72 ± 0.76	Football
Sarvestan et al. (2018) [49]	Cross-Sectional Randomised Design	II	26 (13 m/13 f)	23.9 ± 1.6	University Athletes
Souza et al. (2018) [50]	Cross-Sectional Randomised Trial	II	13 (9 m/4 f)	23.2 ± 3.2	Basketball
Gehrke et al. (2018) [51]	Cross-Sectional Randomised Trial	II	21 (14 m/7 f)	23.7 ± 3.2	Basketball
Sarvestan et al. (2019) [52]	Cross-Sectional Randomised Design	II	25 (13 m/12 f)	23.8 ± 1.62	College Athletes
Alawna et al. (2020) [53]	Randomised Controlled Trial	I	100 (56 m/44 f)	22.25 ± 2.96	Volleyball
Lin et al. (2020) [54]	Randomised Controlled Trial	I	33 (25 m/8 f)	22.0 ± 2.8	Basketball, volleyball, baseball and badminton
Sarvestan et al. (2020) [55]	Case-Control Study	III	30 (19 m/11 f)	23.91 ± 2.58	College Athletes
TOTAL			270 (171 m/99 f)		

* age = mean ± SD.

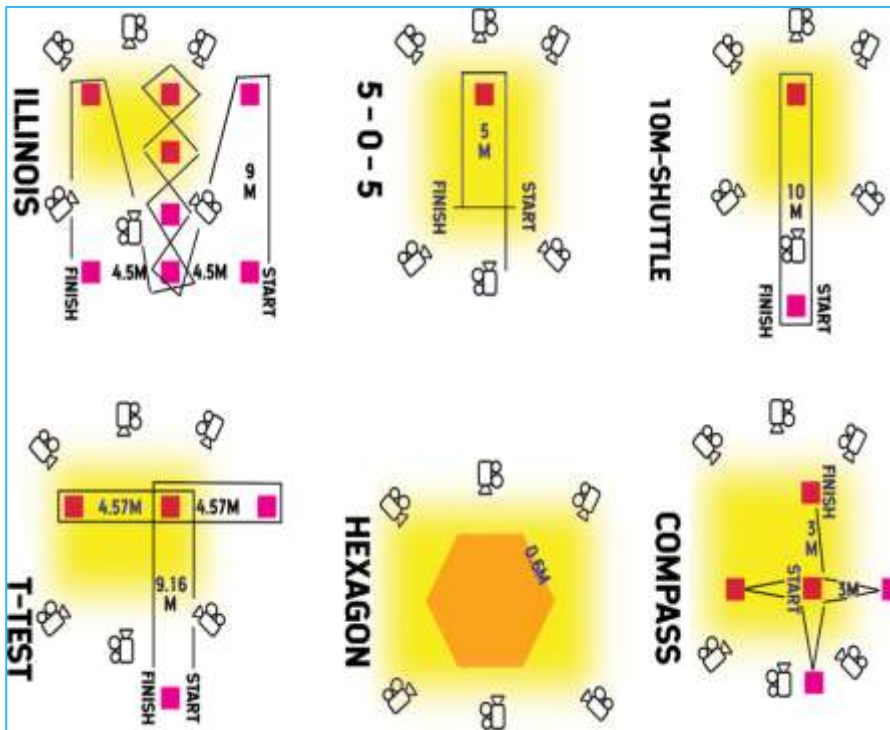
Table 2. Outcome measurements.

Author (Publication Year)	n (m/f)	Outcome Measurements	Test
Kim et al. (2017) [48]	22 (m)	Gait Functions	GAITRite PORTABLE WALKAWAY SYSTEM ^c (cm)
Sarvestan et al. (2018) [49]	26 (13 m/13 f)	Agility	Illinois, 5-0-5, 10-m Shuttle, Hexagon, Compass Drill, T-Agility Test (*s)
Souza et al. (2018) [50]	13 (9 m/4 f)	Dynamic Balance	SEBT (*cm)
Gehrke et al. (2018) [51]	21 (14 m/7 f)	Dynamic Balance Agility	SEBT (cm) Figure-of-8 (s)
Sarvestan et al. (2019) [52]	25 (13 m/12 f)	ROM during Agility tests	Illinois, 5-0-5, 10-m Shuttle, Hexagon, Compass Drill, T-Agility Test (s)
Alawna et al. (2020) [53]	100 (56 m/44 f)	Dynamic Balance *ROM Vertical Jump	Y Balance Test (inches) ROM (degrees) Vertical Jump (inches)
Lin et al. (2020) [54]	33 (25 m/8 f)	Lateral landing performance in single-leg drop	KISTLER FORCE PLATE PEAK *vGRF (%BW), Loading Rate (N/ms), Loading Time (ms), Difference of *CoP-range, Difference of CoP-velocity
Sarvestan et al. (2020) [55]	30 (19 m/11 f)	Postural sway parameters ROM Muscle Activation	KISTLER FORCE PLATE PEAK (cm) ROM (degrees) EMG (% peak)
TOTAL	270 (171 m/99 f)		

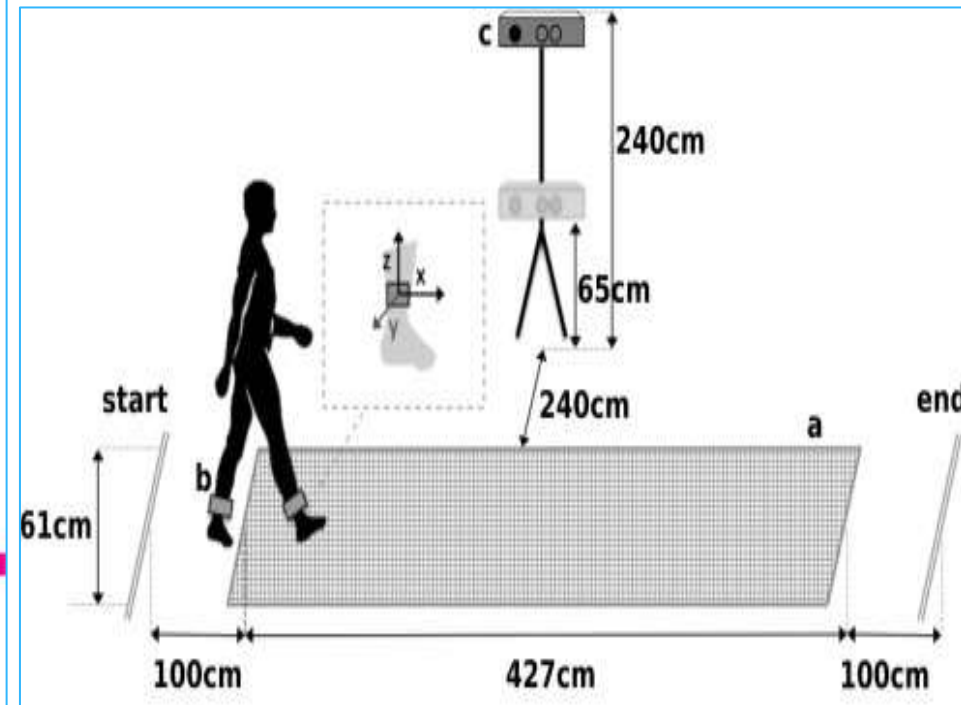
*s = seconds, *cm = centimetres, *ROM = range of movement, *vGRF = ground reaction forces, *CoP = centre of pressure.

Test

Agility

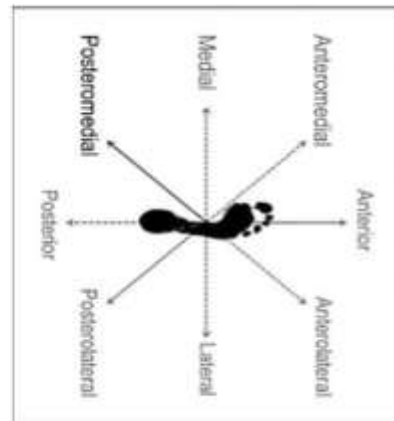
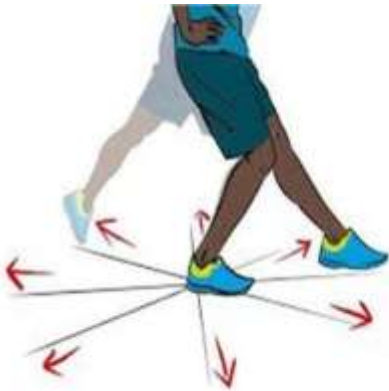


Gait Functions GAITRite PORTABLE WALKAWAY SYSTEM^c

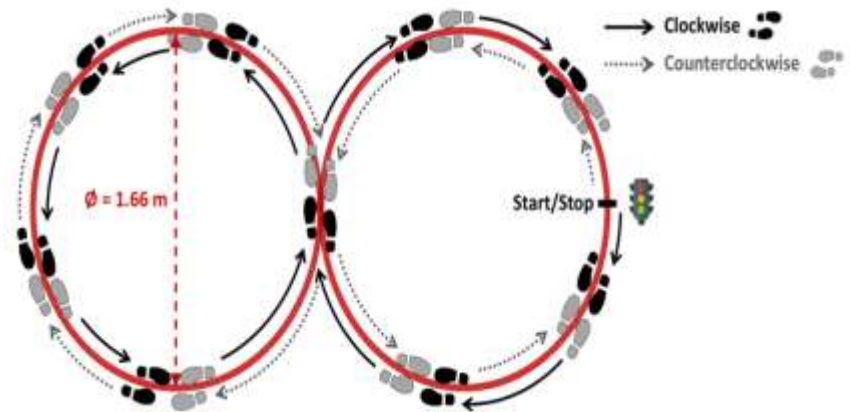


Test

Dynamic Balance Star Excursion Balance Test (SEBT)



Agility Figure-of-8

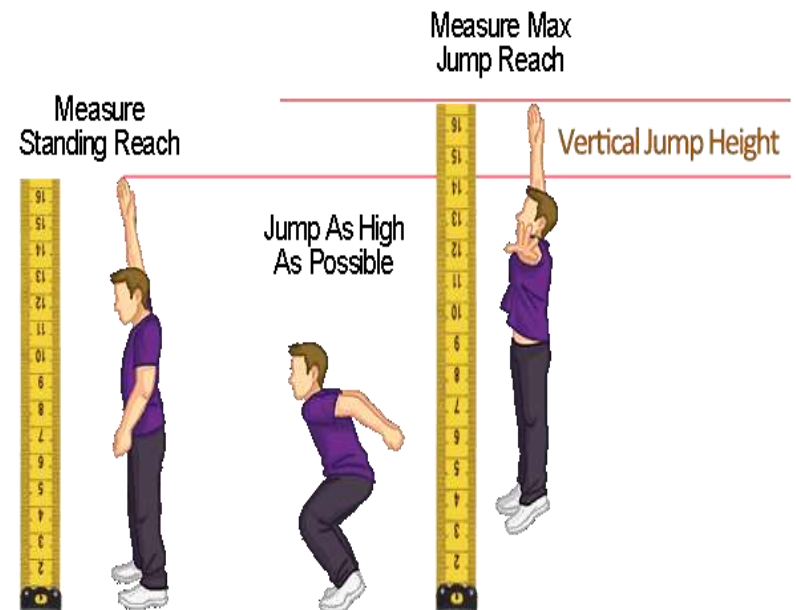


Test

Y Balance Test

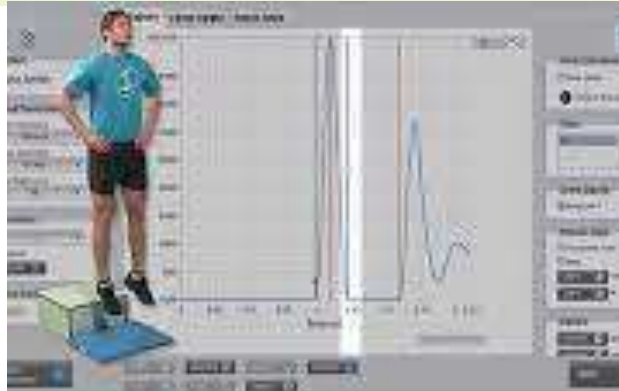


Vertical Jump



Test

KISTLER FORCE PLATE PEAK



Loading Rate

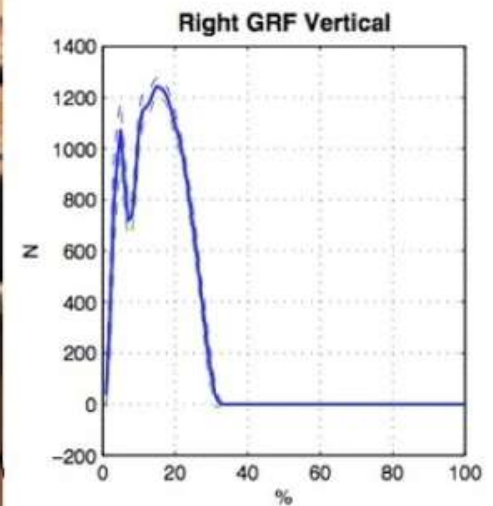
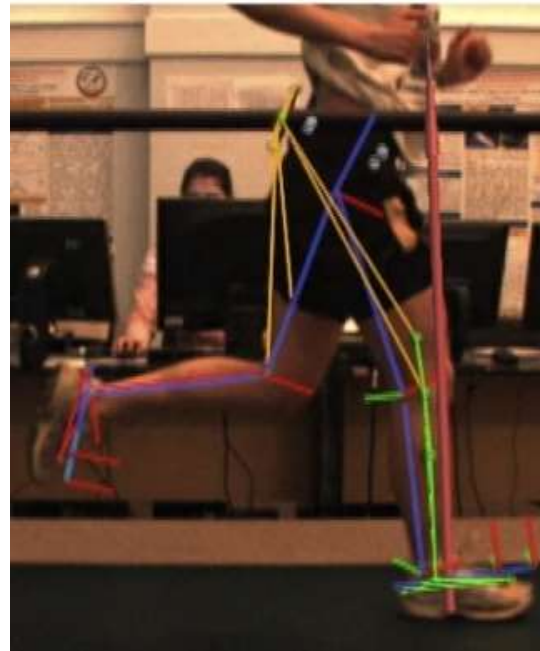


Table 3. Quality Assessment with Downs and Black Scale.

ITEM	Kim et al. (2017) [48]	Sarvestan et al. (2018) [49]	Souza et al. (2018) [50]	Gehrke et al. (2018) [51]	Sarvestan et al. (2019) [52]	Alawna et al. (2020) [53]	Lin et al. (2020) [54]	Sarvestan et al. (2020) [55]
1.	1	1	1	1	1	1	1	1
2.	1	1	1	1	1	1	1	1
3.	1	1	1	1	1	1	1	1
4.	1	1	1	1	1	1	1	1
5.	2	1	2	2	0	2	2	0
6.	1	1	1	1	0	1	1	1
7.	1	1	1	1	1	1	1	1
8.	0	0	0	0	0	1	1	1
9.	0	0	0	0	0	0	0	0
10.	0	0	1	1	1	0	0	1
11.	1	1	1	1	1	1	1	1
12.	1	1	1	1	1	1	1	1
13.	1	1	1	1	1	1	1	1
14.	1	0	1	0	0	1	0	0
15.	1	0	1	1	0	0	0	0
16.	0	0	0	0	0	0	0	0
17.	1	1	1	1	1	1	1	1
18.	1	1	1	1	1	1	1	1
19.	1	1	1	1	1	1	1	1
20.	1	1	1	1	1	1	1	1
21.	1	1	1	1	1	1	1	1
22.	U/D	U/D	U/D	U/D	U/D	U/D	U/D	U/D
23.	1	0	1	1	0	1	1	0
24.	1	0	1	1	0	1	1	0
25.	1	1	1	1	1	1	1	0
26.	0	0	0	0	0	0	0	0
27.	0	1	0	0	1	0	0	0
TOTAL	21/28	17/28	22/28	21/28	16/28	21/28	20/28	16/28

U/D = undetermined.

Quality assessment:
Average score: 19.25/28
Ranging: 16~22

Excellent: 24–28 points
Good: 19–23 points
Fair: 14–18 points
Poor: <14 points



Table 4. Results.

no significant

Parameter	Effect Size or ES (SMD)	Standard Error	95% CI	p-Value	I ²
Dynamic Balance					
SEBT	0.197	0.237	−0.268 to 0.662	0.406	0.00%
SEBT-A	0.0979	0.237	−0.375 to 0.571	0.681	0.00%
SEBT-AM	0.269	0.238	−0.206 to 0.744	0.263	0.00%
SEBT-M	0.199	0.237	−0.275 to 0.673	0.405	0.00%
SEBT-PM	0.211	0.237	−0.263 to 0.685	0.377	0.00%
SEBT-P	0.187	0.237	−0.286 to 0.661	0.433	0.00%
SEBT-PL	0.250	0.238	−0.224 to 0.725	0.296	0.00%
SEBT-L	0.286	0.238	−0.189 to 0.761	0.234	0.00%
SEBT-AL	0.0753	0.237	−0.398 to 0.548	0.752	0.00%
Lateral Landing					
Kistler force plate peak vGRF—ground reaction forces	0.09 (overall ES sensu Morris)				
	0.134 (overall ES sensu Klauer)				
	0.588 (pre)	0.246	0.095 to 1.081	0.017	0.00%
	0.455 (post)	0.249	−0.034 to 0.943	0.068	0.00%
Loading Rate	0.243 (overall ES sensu Morris)				
	0.233 (overall ES sensu Klauer)				
	0.127 (pre)	0.246	−0.356 to 0.61	0.606	0.00%
	0.360 (post)	0.248	−0.126 to 0.846	0.147	0.00%
★ Loading Time	0.760 (overall ES sensu Morris)				
	0.836 (overall ES sensu Klauer)				
	0.119 (pre)	0.246	−0.364 to 0.602	0.629	0.00%
	0.717 (post)	0.366	−0.22 to 1.215	0.050	0.00%
Gait Functions					
★ Velocity	1.978	0.368	1.257 to 2.699	0.000	0.00%
Step	2.271	0.387	1.513 to 3.029	0.000	0.00%
Stride	2.277	0.387	1.519 to 3.036	0.000	0.00%
H-H Base support	1.920	0.365	1.205 to 2.634	0.000	0.00%

0.2 :small, 0.5:modeate, ≥0.8: large



Table 4. Results.

no significant

Parameter	Effect Size or ES (SMD)	Standard Error	95% CI	p-Value	<i>f</i> ²
Agility					
Illinois	Male: 0.213 (overall ES sensu Morris)	0.410	−0.59 to 1.02	0.603	0.00%
	0.254 (overall sensu Klauer);	0.410	−0.55 to 1.06	0.536	0.00%
	Female: −0.136 (overall ES sensu Morris)	0.409	−0.94 to 0.67	0.739	0.00%
	−0.186 (overall sensu Klauer)	0.409	−0.99 to 0.62	0.649	0.00%
5-0-5	Male: −0.329 (overall ES sensu Morris)	0.411	−1.14 to 0.48	0.424	0.00%
	−0.425 (overall sensu Klauer);	0.413	−1.23 to 0.38	0.304	0.00%
	Female: −0.412 (overall ES sensu Morris)	0.413	−1.22 to 0.40	0.318	0.00%
	−0.481 (overall sensu Klauer)	0.415	−1.29 to 0.33	0.246	0.00%
10-m Shuttle	Male: −0.351 (overall ES sensu Morris)	0.412	−1.16 to 0.46	0.394	0.00%
	−0.525 (overall sensu Klauer);	0.416	−1.34 to 0.29	0.207	0.00%
	Female: −0.56 (overall ES sensu Morris)	0.417	−1.38 to 0.26	0.179	0.00%
	−0.456 (overall sensu Klauer)	0.414	−1.27 to 0.36	0.271	0.00%
Hexagon	Male: 0.127 (overall ES sensu Morris)	0.409	−0.67 to 0.93	0.756	0.00%
	0.253 (overall sensu Klauer);	0.410	−0.55 to 1.06	0.537	0.00%
	Female: 0.312 (overall ES sensu Morris)	0.411	−0.49 to 1.12	0.448	0.00%
	0.252 (overall sensu Klauer)	0.410	−0.55 to 1.06	0.539	0.00%
Compass Drill	Male: −0.055 (overall ES sensu Morris)	0.408	−0.86 to 0.75	0.893	0.00%
	−0.061 (overall sensu Klauer);	0.408	−0.86 to 0.74	0.881	0.00%
	Female: −0.067 (overall ES sensu Morris)	0.408	−0.87 to 0.73	0.870	0.00%
	−0.092 (overall sensu Klauer)	0.408	−0.89 to 0.71	0.822	0.00%
T-Agility Test	Male: 0.339 (overall ES sensu Morris)	0.411	−0.47 to 1.15	0.410	0.00%
	0.341 (overall sensu Klauer);	0.411	−0.47 to 1.15	0.407	0.00%
	Female: −0.402 (overall ES sensu Morris)	0.413	−1.21 to 0.41	0.330	0.00%
	−0.415 (overall sensu Klauer)	0.413	−1.22 to 0.39	0.315	0.00%
Figure of 8	0.302	0.310	−0.307 to 0.910	0.331	0.00%

Table 4. Results.

★	Parameter	Effect Size or ES (SMD)	Standard Error	95% CI	p-Value	I ²
	ROM					
	Ankle angle peak Dorsi—Plantar flexion	0.03	0.258	−0.48 to 0.54	0.908	0.00%
	Ankle angle Inversion—Eversion	0.52	0.263	0.00 to 1.04	0.048	0.00%
	Knee angle peak Flexion—Extension	0.01	0.258	−0.50 to 0.52	0.978	0.00%
	Hip angle Peak Flexion—Extension	0.05	0.258	−0.46 to 0.56	0.831	0.00%
	Hip angle Peak Abduction—Adduction	0.12	0.258	−0.39 to 0.63	0.794	0.00%
	Sway parameters					
	Sway length	0.14	0.259	−0.37 to 0.65	0.436	0.00%
	Sway area	0.37	0.261	−0.14 to 0.88	0.499	0.00%
	Sway displacement anterior-posterior	0.15	0.259	−0.36 to 0.66	0.433	0.00%
	Sway displacement medial-lateral	0.46	0.262	−0.05 to 0.97	0.162	0.00%
	Total velocity	0.16	0.259	−0.35 to 0.67	0.436	0.00%
	Sway velocity anterior-posterior	0.17	0.259	−0.34 to 0.68	0.433	0.00%
	Sway velocity medial-lateral	1.25	0.284	0.69 to 1.81	0.029	0.00%
	Average muscle activity (% Peak)					
	Lateral Gastrocnemius	0.01	0.258	−0.50 to 0.52	0.963	0.00%
	Medial Gastrocnemius	0.01	0.258	−0.50 to 0.52	0.901	0.00%
	Tibialis Anterior	0.06	0.258	−0.45 to 0.57	0.674	0.00%
	Peroneus Longus	0.55	0.263	0.03 to 1.07	0.042	0.00%

**Gait
functions**

- ✓ step velocity
- ✓ step
- ✓ stride length
- ✓ ↓ base of support

**Kinesio
taping**

**Postural
sway**

- ✓ ↓ med-lateral
direction

**Muscle
activation**

- ✓ ↓ long peroneus

ROM

- ✓ ↓ Inversion
- ✓ ↓ eversion



Discussion_Gait Functions

- This is the first systematic review and meta-analysis to investigate only the effect of KT on the sports performances and ankle functions of athletes with CAI.
- The entire gait cycle can be altered by an increase in ankle inversion, which can cause both a shorter step length and an increase in the base of support and a reduction in gait speed.

Clin. Rehabil. 2009, 23, 609–621; J. Athl. Train. 2014, 49, 322–330

- ✓ *↑ step length and stride length*
- ✓ *↑ speed*
- ✓ *↓ Heel-Heel base distance*

Discussion_Ankle Joint ROM

- Ankle joint motion has also been found to influence the lower extremity landing pattern in people with CAI.

Ann. Rehabil. Med. 2013, 37, 10.

→ ↓mechanical and perceptive sense

Musculoskelet. Sci. Pract. 2020, 50, 102.

→ ↑dorsi–plantar flexion during movement

Phys. Ther. Sport 2020, 45, 161–167

✓ ↓inversion–eversion ankle range



Discussion_Muscle Contraction

- Cutaneous stimulation of the tape may induce a greater sensitisation of **type 2 mechanoreceptors** and improve the **recruitment of motor units**

Technol. Health Care 2015, 23, 333–341.

- In the leg with the KT applied, there was a strong **decrease in muscle activation** justified by a supporting action.

Phys. Ther. Sport 2020, 45,161–167

✓ ↓ peroneus longus



Discussion

- Limitation

1. The meta-analysis did **not** evaluate identical outcome variables
2. Heterogeneity: different tensions of the tape or applying KT in different directions and shapes
3. KT is not typically used as a single treatment tool

- Strengths

1. randomised controlled trials (7/8)
2. high level of quality and scientific evidence
 - *Downs and Black Scale: 19.25/28
 - *level of evidence between I and II
3. published recently (from 2017 to 2020)
4. ankle function and athletes' functional performance testing
5. independent meta-analyses :heterogeneous



CASP系統性文獻回顧檢核表



Section A: Are the results of the study valid?

Section B: What are the results?

Section C: Will the results help locally?

Section A: Are the results of the study valid?

1. Did the review address a clearly focused question?(是否清楚明確問題?)

HINT: An issue can be 'focused' In terms of

- ☐ the population studied
- ☐ the intervention given
- ☐ the outcome considered

Yes	V
Can't Tell	
No	

問題/研究族群 P roblem/Patient	Recurrent sprains can lead to a condition of chronic ankle instability (CAI).
給予的措施 I ntervention	Kinesio Taping
對照組 C omparison	Athletic-taped, control, ankle brace, bandaging
結果 O utcome	Gait Functions 、 Ankle Joint ROM 、 Muscle Contraction 、 Postural Sway during Movement 、 Dynamic Balance 、 Agility

Section A: Are the results of the study valid?

2. Did the authors look for the right type of papers?(尋找合適文獻?)

HINT: 'The best sort of studies' would

- ☐ Address the review's question
- ☐ have an appropriate study design (usually RCTs for papers evaluating interventions)

Yes	V
Can't Tell	
No	

- randomised controlled trials (7/8)
- The eight studies included reported a high level of quality and scientific evidence: an average score of 19.25/28, according to the Downs and Black Scale, and a level of evidence between I and II (three studies I; four level II)



Section A: Are the results of the study valid?

3. Do you think all the important, relevant studies were included?(重要相關文獻被納入?)

HINT: Look for

- ☐ Which bibliographic databases were used
- ☐ Follow up from reference lists
- ☐ personal contact with experts
- ☐ unpublished as well as published studies
- ☐ non-English language studies

Yes	
Can't Tell	V
No	

- The existing literature was systematically searched from 2010 to December 2021 using the databases PubMed/MEDLINE20, ISI/Web of Science (WoS) and Scopus.
- A language filter was also applied, searching in **English only**.



Section A: Are the results of the study valid?

4. Did the review's authors do enough to assess quality of the included studies? (是否評估所納入文獻品質?)

HINT: The authors need to consider the rigour of the studies they have identified. Lack of rigour may affect the studies' results

Yes	V
Can't Tell	
No	

- randomised controlled trials (7/8)
- high level of quality and scientific evidence
 - *Downs and Black Scale: 19.25/28
 - *level of evidence between I and II
- The selected articles and references were reviewed and assessed independently by two reviewers (GDR and MT), and all queries were discussed and resolved by the supervisory team (CB and PN) during regular meetings

Section A: Are the results of the study valid?

5. If the results of the review have been combined, was it reasonable to do so?(作者將研究結果進行合併是否合理?)

HINT: Consider whether

- ☐ results were similar from study to study
- ☐ results of all the included studies are clearly displayed
- ☐ results of different studies are similar
- ☐ reasons for any variations in results are discussed

Yes	
Can't Tell	V
No	

- Effect sizes (ESs) were synthesised as standardized mean differences between the control and intervention groups, correcting for the small sample size when necessary (Hedges'g).
- Table 4.

Outcome Measurements	Test
Gait Functions	GAITRite PORTABLE WALKAWAY SYSTEMc (cm)
Agility	Illinois, 5-0-5, 10-m Shuttle, Hexagon, Compass Drill, T-Agility Test (*s)
Dynamic Balance	SEBT (*cm)
Dynamic Balance Agility	SEBT (cm) Figure-of-8 (s)
ROM during Agility tests	Illinois, 5-0-5, 10-m Shuttle, Hexagon, Compass Drill, T-Agility Test (s)
Dynamic Balance *ROM Vertical Jump	Y Balance Test (inches) ROM (degrees) Vertical Jump (inches)
Lateral landing performance in single-leg drop	KISTLER FORCE PLATE PEAK *vGRF (%BW), Loading Rate (N/ms), Loading Time (ms), Difference of *CoP-range, Difference of CoP-velocity
Postural sway parameters ROM Muscle Activation	KISTLER FORCE PLATE PEAK (cm) ROM (degrees) EMG (% peak)



Section B: What are the results?

6. What are the overall results of the review?(文獻整體結果?)

HINT: Consider

- ❑ If you are clear about the review's 'bottom line' results
- ❑ what these are (numerically if appropriate)
- ❑ how were the results expressed (NNT, odds ratio etc.)

Table 4. Results.

Parameter	Effect Size or ES (SMD)	Standard Error	95% CI	p-Value	I ²
Dynamic Balance					
SEBT	0.197	0.237	−0.268 to 0.662	0.406	0.00%
SEBT-A	0.0979	0.237	−0.375 to 0.571	0.681	0.00%
SEBT-AM	0.269	0.238	−0.206 to 0.744	0.263	0.00%
SEBT-M	0.199	0.237	−0.275 to 0.673	0.405	0.00%
SEBT-PM	0.211	0.237	−0.263 to 0.685	0.377	0.00%
SEBT-P	0.187	0.237	−0.286 to 0.661	0.433	0.00%
SEBT-PL	0.250	0.238	−0.224 to 0.725	0.296	0.00%
SEBT-L	0.286	0.238	−0.189 to 0.761	0.234	0.00%
SEBT-AL	0.0753	0.237	−0.398 to 0.548	0.752	0.00%
Lateral Landing					
Kistler force plate peak vGRF—ground reaction forces	0.09 (overall ES sensu Morris)				
	0.134 (overall ES sensu Klauer)				
	0.588 (pre)	0.246	0.095 to 1.081	0.017	0.00%
	0.455 (post)	0.249	−0.034 to 0.943	0.068	0.00%

Section B: What are the results?

7. How precise are the results?(結果精準嗎?)

HINT: Look at the confidence intervals, if given

Table 2. Outcome measurements.

Author (Publication Year)	n (m/f)	Outcome Measurements	Test
Kim et al. (2017) [48]	22 (m)	Gait Functions	GAITRite PORTABLE WALKAWAY SYSTEMc (cm)
Sarvestan et al. (2018) [49]	26 (13 m/13 f)	Agility	Illinois, 5-0-5, 10-m Shuttle, Hexagon, Compass Drill, T-Agility Test (*s)
Souza et al. (2018) [50]	13 (9 m/4 f)	Dynamic Balance	SEBT (*cm)
Gehrke et al. (2018) [51]	21 (14 m/7 f)	Dynamic Balance Agility	SEBT (cm) Figure-of-8 (s)
Sarvestan et al. (2019) [52]	25 (13 m/12 f)	ROM during Agility tests	Illinois, 5-0-5, 10-m Shuttle, Hexagon, Compass Drill, T-Agility Test (s)
Alawna et al. (2020) [53]	100 (56 m/44 f)	Dynamic Balance *ROM Vertical Jump	Y Balance Test (inches) ROM (degrees) Vertical Jump (inches)
Lin et al. (2020) [54]	33 (25 m/8 f)	Lateral landing performance in single-leg drop	KISTLER FORCE PLATE PEAK *vGRF (%BW), Loading Rate (N/ms), Loading Time (ms), Difference of *CoP-range, Difference of CoP-velocity
Sarvestan et al. (2020) [55]	30 (19 m/11 f)	Postural sway parameters ROM Muscle Activation	KISTLER FORCE PLATE PEAK (cm) ROM (degrees) EMG (% peak)
TOTAL	270 (171 m/99 f)		

*s = seconds, *cm = centimetres, *ROM = range of movement, *vGRF = ground reaction forces, *CoP = centre of pressure.

Table 4. Results.

Parameter	Effect Size or ES (SMD)	Standard Error	95% CI
Dynamic Balance			
SEBT	0.197	0.237	-0.268 to 0.662
SEBT-A	0.0979	0.237	-0.375 to 0.571
SEBT-AM	0.269	0.238	-0.206 to 0.744
SEBT-M	0.199	0.237	-0.275 to 0.673
SEBT-PM	0.211	0.237	-0.263 to 0.685
SEBT-P	0.187	0.237	-0.286 to 0.661
SEBT-PL	0.250	0.238	-0.224 to 0.725
SEBT-L	0.286	0.238	-0.189 to 0.761
SEBT-AL	0.0753	0.237	-0.398 to 0.548
Lateral Landing			
Kistler force plate peak vGRF—ground reaction forces			
	0.09 (overall ES sensu Morris)		
	0.134 (overall ES sensu Klauer)		
	0.588 (pre)	0.246	0.095 to 1.081
	0.455 (post)	0.249	-0.034 to 0.943

Section C: Will the results help locally?

8. Can the results be applied to the local population?(結果是否適合當地族群)

HINT: Consider whether

- ☐ the patients covered by the review could be sufficiently different to your population to cause concern
- ☐ your local setting is likely to differ much from that of the review

Yes	V
Can't Tell	
No	

- Chronic ankle instability (CAI) is the process caused by repetitive ankle sprains and multiple episodes of the ankle “giving way” with persistent symptoms.



Section C: Will the results help locally?

9. Were all important outcomes considered?(所有重要臨床結果都有被考慮?)

HINT: Consider whether

- ☐ there is other information you would like to have seen

Yes	V
Can't Tell	
No	

- Gait Functions 、 Ankle Joint ROM 、 Muscle Contraction 、 Postural Sway during Movement 、 Dynamic Balance 、 Agility



Section C: Will the results help locally?

10. Are the benefits worth the harms and costs?(付出傷害和花費換得介入所產生益處是否值得?)

HINT: Consider

- ☐ even if this is not addressed by the review, what do you think?

Yes	V
Can't Tell	
No	

- These high incidence rates show that these injuries can cause high costs for health care systems; Gribble et al. showed that ankle injuries cost USD 6.2 billion in high school athletes in the US and EUR 208 million in the Netherlands annually



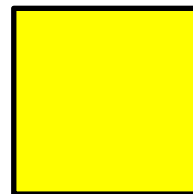
肌內效貼布可改善慢性腳踝扭傷運動員的動作表現嗎？



同意: 12位



不同意: 0位



需要更多文獻支持:
17位



感謝您耐心聆聽!

