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Review article

The possibility of the use of Kinesio Taping in internal, oncologic, and neurologic diseases: A systematic review and meta-analysis

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ABSTRACT

Objectives: This systematic review aimed to present the current body of knowledge on Kinesio Taping (KT) as a treatment method for patients with internal, oncologic, and neurologic diseases.
Data Sources: PubMed, MEDLINE, CENTRAL (Cochrane Library), EMBASE Excerpta Medica, and Google Scholar.
Study Selection: The papers were identified through term searches in digital research databases. Based on the review of the available 152 research articles, 12 papers on internal, oncologic, and neurologic diseases were selected. Two of this review's authors, working independently, selected the papers to be included in the analyzed sample, performed a bias risk assessment and assessed the quality of the evidence for the main effects using the Internal Validity Score (IVS) (PEDro) approach. A simplified version of the Oxford Centre for Evidence-Based Medicine (OCEBM) system was used to evaluate the evidence.
Data Extraction: The full text of each relevant study was read by two independent reviewers to extract data. The collected database was subjected to matrix processing. Variable vectors for individually analyzed categories were designated and used in the meta-analysis.
Data Synthesis: There are few prospective, randomized controlled trials on KT that include a sufficiently large cohort. Only few of the reviewed papers which discuss the principles of KT met the criteria of scientifically rigorous research.
Conclusions: We found some evidence to support the use of KT in clinical practice in patients with neurologic, oncologic, and internal diseases. However, there is a need for further clinical trials on the effectiveness of the use of the KT method.

Introduction

Kinesio Taping (KT) is a physiotherapeutic method which stimulates the self-regulatory processes of the body. It was developed by Dr. Kenzo Kase, a Japanese chiropractor.[1] In literature and everyday practice, KT is also commonly referred to as kinesiotaping, Kinesiology Taping, Kinesiology Tape, and K/active Tape. The method is based on applications of thin, elastic, water-resistant tape on skin. Williams et al.[2] reports that KT method was first used in the 1970s. It was developed for sports injuries and is believed to support damaged tissues (i.e. muscles and joints), thereby resulting in pain relief. KT seems to be an effective method in the management of lymphedema[3,4] and also it can also influence cutaneous mechanoreceptors by providing constant afferent stimulation. This allows more sensory information to the central nervous system, resulting in improved posture control and coordination.[5] KT is claimed to stimulate muscle activity, support weak muscles and provide proprioceptive feedback to maintain postural alignment and postural stability.[6,7] Very few studies refer to the influence of KT applications on the reflexive mechanism of action involving skin-organ and organ-skin reflexes. KT applications on specific areas of abdomen can stimulate skin-organ and organ-skin mechanisms.[8–10]

The currently available materials on KT, especially those based on scientifically established facts, are scarce. The literature on KT includes papers investigating the possibility of using KT as a treatment method, but their results are inconclusive. Some hypotheses and theories are contradictory, many of them are not supported by

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experimental results, and the conclusions drawn from them are dubious.[11,12]

As it has been mentioned above, numerous research reviews and meta-analyses have been published in the areas of applying KT in sport and musculoskeletal dysfunctions. However, KT applications' efficiency in other areas of medicine does not seem to have been sufficiently verified. Therefore, the objective of this review was to present the current body of knowledge on KT as a treatment method for patients with internal, oncologic, and neurologic diseases, based on the available literature (i.e., articles published in Polish and international academic journals). The analysis also included most recently published academic textbooks, conference proceedings, and PhD theses.

Methods

The analysis, which involved a systematic review of literature, consisted of two parts. The first part of the analysis was conducted between January and February 2018. At that time, a preliminary selection of the analyzed material was conducted, which identified the research papers investigating the use of KT as a treatment method. Keywords used in this part of the analysis include Kinesio Taping OR Kinesiology Taping OR Kinesiology Tape OR K/active Tape AND Medicine.

During the first stage of the review process, the relevant papers were identified on the basis of their titles and abstracts. The selection of the material for analysis was conducted in accordance with the following inclusion criteria: the language of the article was Polish, German, or English and the methods used in the study included KT as the primary or adjunct treatment in medicine. A total of 152 papers were selected in the first part of the analysis.

The second stage of the analysis, which involved more detailed analysis of the selected papers on the use and efficacy of KT as a treatment method in patients with internal, oncologic, and neurologic diseases, was conducted between March and April 2018. The papers were assessed by means of the simplified Oxford Centre for Evidence-Based Medicine (OCEBM) system, wherein only those with the highest level of evidence recommendation (level A) were selected. The second stage also included selected tests that were classified as being borderline of A and B levels of evidence recommendation (i.e., A/B) (Table 1).

The flowchart of the review process is presented in Fig. 1.

The papers were identified on the basis of term searches in digital research databases (PubMed, MEDLINE, CENTRAL - Cochrane Controlled Register of Trials, EMBASE Excerpta Medica, and Google Scholar). The relevant literature was selected through manual searches. Two of the authors of this review, working independently, selected the papers to be included in the analyzed sample, isolated the data, performed an assessment of the risk of bias, and assessed the quality of the evidence for the main effects using the Internal Validity Score (IVS) (PEDro) approach. For that purpose, several types of materials on using KT as a treatment method in the disciplines relevant to this review were analyzed, including papers published in peer-reviewed journals, academic textbooks, PhD theses, and conference and workshop proceedings. As a result, 12 items were positively reviewed and underwent a full-text analysis (Table 2).

Two reviewers independently assessed the quality of selected papers, using 11-point PEDro scale, prepared by the Centre of Evidence-Based Physiotherapy (CEBP). PEDro scale comprises a list of 11 questions analyzing individual aspects of test methodology, including key aspects of internal reliability (Table 3).

With the use of PEDro scale in the assessment of randomized controlled tests, an adequate reliability standard between raters was achieved (inter-rater reliability), which allowed for more comprehensive assessment of methodological quality. The scoring system

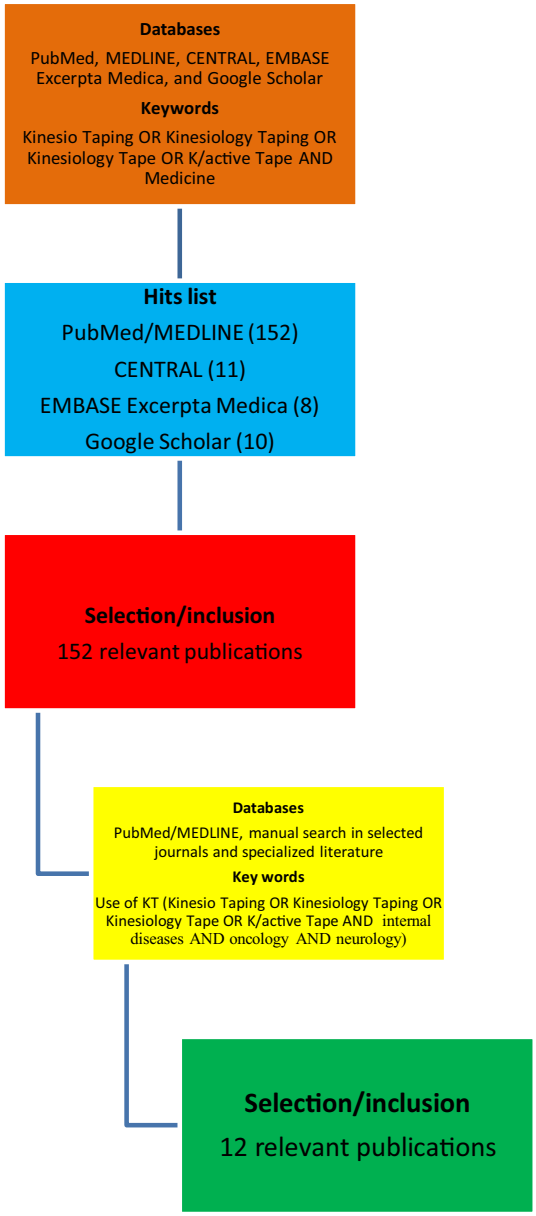

Fig. 1. Flowchart of the review process.

Table 1
Evaluation of evidence using the simplified Oxford Centre for Evidence-Based Medicine system.

Recommendation grade	Evidence level	Classification by study type
A	1-a	Systematic review of randomized controlled trials (RCTs)
	1-b	Single RCT (well designed)
	1-c	The all-or-nothing principle
B	2-a	Systematic review of cohort studies (well designed)
	2-b	Single RCT with moderate observation (well designed)
	2-c	Results of the study
	3-a	Systematic review of case studies
	3-b	Case-control study
C	4	A series of cases, weak cohort, and control studies
D	5	Expert opinion not supported by clinical assessment, physiological models, comparisons, or principles.

Table 2
Kinesio Taping for the treatment of internal, neurologic, and oncologic diseases.

No.	Clinical categories of the therapeutic functions	Study design	Participants	Evidence assessment*	Source	Effects **	Internal Validity Score (IVS) ***
1.	Assessment of KT effect on digestive processes, pain severity, physical activity tolerance, and pain medication use	Randomized trial	CHL patients	A	Krajczy M, Bogacz K, Luniewski J, et al. (2012)[8]	1E	3/7/± 0
2.	Assessment of KT effect on pain severity, physical activity tolerance, and mood	Randomized trial	CHL patients	A	Tantawy SA, Kamel DM (2015)[9]	1E	3/7/± 0
3.	Pain assessment	Randomized placebo-controlled trial	Lung lobectomy patients	A	Imperatori A, Grande A, Castiglioni M, et al. (2016)[13]	1E	4/7/SD2
	I. KT effects in internal diseases: 3 tests: 3E=*E*						$\bar{x}$ 3.33
4.	Effect of KT on the size of lymphedema and manual dexterity of the upper extremity	Randomized placebo-controlled trial	Breast cancer patients	A/B	Taradaj J, Halski T, Rosinczuk J, et al. (2016)[14]	1E	7/7/± 0
5.	Efficacy of KT in treating breast cancer-related lymphedema	Single-blind randomized trial	Lymphedema patients (II and III stage)	A	Smykla A, Walewicz K, Trybulski R, et al. (2013)[15]	1WE	7/7/± 0
6.	Assessment of the effects of KT on breast cancer-related lymphedema	Systematic review	Breast cancer-related lymphedema patients	A	Morris D, Jones D, Ryan H, Ryan CG. (2013)[16]	1E	3/7/± 0
	II. KT effects in oncology: 3 tests, 2E, 1WE=*E*						$\bar{x}$5.66
7.	Evaluation of numerical rating scale scores, Shoulder Pain and Disability Index, ultrasound findings, and pain-free passive range of motion of the affected shoulder before and after the intervention	Double-blind randomized trial	Stroke patients with HSP	A	Huang YC, Chang KH, Liou TH, et al. (2017)[17]	1E	7/7/± 0
8.	Assessment of the effects of KT on HSP and functionality of patients with subacute stroke	Double-blind randomized trial	Stroke patients with HSP	A	Huang Yu C, Leong Chau P, Wang, Lin, et al. (2016)[18]	1NE	5/7/SD2
9.	Assessment of the effect of lower-leg KT on balance in stroke patients (Berg Balance Scale)	Randomized trial	Stroke patients	A/B	Bae YH, Kim HG, Min KS, et al. (2015)[19]	1WE	3/7/± 0
10.	Assessment of the effect of KT on quadriceps femoris (in isokinetic conditions, on gait and functional parameters) in stroke patients	Randomized trial	Stroke patients	A/B	Ekiz T, Aslan M D, Ozgirgin N (2015)[20]	1E	3/7/± 0
11.	Assessment of the effect of KT on spasticity, balance, and gait in spinal cord injury (ROM, spasticity, pain severity, balance, gait, EMG)	Randomized trial	Patients with spinal cord injury	A	Tamburella F, Scivoletto G, Molinari M (2014)[21]	1E	3/7/± 0
12.	VAS, Toronto Western Spasmodic Torticollis Rating Scale (CD) and Writer's Cramp Rating Scale (FHD), sensory functions (somatosensory temporal discrimination threshold)	Randomized trial	Patients with focal dystonia	A	Pelosin E, Avanzino L, Marchese R, et al. (2013)[22]	1E	3/7/± 0
	III. KT effects in neurology: 6 tests: 4E, 1WE, 1NE=*E*						$\bar{x}$ 4.0

* Classification in accordance with the recommendations of the Oxford Centre for Evidence-Based Medicine for a simplified evidence evaluation system (A-D).
** Effects: ES = WE (weak positive effect); *E* = *E* (positive effect); AE = NE (negative effect).
*** Internal Validity Score (IVS) according to the PEDro scale - modification according to Maher et al.[23]

with the use of PEDro scale comprised 1 point score for each positive answer (yes) and zero for each negative answer (no). External reliability of papers was analyzed in the first point of the PEDro scale and was not taken into account in the final scoring; thus, the final scoring does not exceed 10 points.

The methodological quality of the test is reflected in the internal validity. In the PEDro scale, seven out of eleven points refer to internal validity. Methodological quality of randomized controlled test is the most important one because, in tests with low methodological quality, the efficacy of treatment may be exaggerated and may cause falsification of test result. The internal validity of each test in this study was assessed in detail with the use of IVS. For the needs of this study, points 2, 3, 5, 6, 7, 8, and 9 of the PEDro scale, representing the degree of internal validity, were selected for the final assessment.

One point was awarded for meeting each of the IVS criteria. Tests with a final IVS of 6–7, 4–5, and 0–3 were considered to be high-quality,

Table 3
PEDro scale (modified according to Maher et al.[23]).

Criteria	Scoring YES (1) NO (0)
1. Eligibility criteria were specified	
2. Subjects were randomly allocated to groups (in a crossover study, subjects were randomly allocated an order in which treatments were received)	
3. Allocation was concealed	
4. The groups were similar at baseline regarding the most important prognostic indicators	
5. There was blinding of all subjects	
6. There was blinding of all therapists who administered the therapy	
7. There was blinding of all assessors who measured at least one key outcome	
8. Measurements of at least one key outcome were obtained from more than 85% of the subjects initially allocated to groups	
9. All subjects for whom outcome measurements were available, received the treatment or control condition as allocated, or where this was not the case, data for at least one key outcome were analyzed by "intention to treat"	
10. The results of between-group statistical comparisons are reported for at least one key outcome	
11. The study provides both point measurements and measurements of variability for at least one key outcome	

moderate, and poor methodological quality tests, respectively.[23,24] Any assessment discrepancies between the two reviewers were resolved by discussion and re-assessment of the given criterion. If the doubts were not clarified, it was possible to consult other reviewers, but it turned out to be unnecessary, as the agreement was reached.

Because of clinical and methodological diversity among the analyzed studies it was decided to use statistical methods that would allow to compare the effects between them. The collected database was subjected to matrix processing. A design matrix, also known as model matrix or analysis matrix, is a matrix of values of explanatory variables of a set of objects. Each row represents an individual object, with the successive columns corresponding to the variables and their specific values for that object. Variable vectors for individually analyzed categories were designated and used in the meta-analysis. A vector is a list of mathematical variables each of whose value is unknown because the knowledge of its value is imperfect. The analysis defined the following effects on the scale: effect (E), weak effect (WE) and negative effect (NE). The complete meta-analysis was carried out using the Statistica package - Plus module (StatSoft, Poland). The effects of the study were subjected to a detailed meta-analysis with the D indicator - raw mean difference (Fig. 2).

Results

Among the 12 included papers investigating the use of KT as a therapy method in internal, oncologic, and neurologic diseases, 3 papers examined the effects of KT on patients who underwent surgical procedures and thoracic surgery for internal diseases, 3 papers investigated the use of KT as a lymphedema treatment in cancer patients, and the remaining 6 articles focused on the use of KT in neurology.

The methodological quality of all tests (IVS), according to the PEDro scale, was assessed as: IVS $\bar{x}$4.33 / 7 points, which means moderate grade. The highest quality was reported for tests in oncologic diseases: IVS $\bar{x}$5.66 / 7 points, moderate grade. IVS of tests in internal diseases was rated at $\bar{x}$3.33 / 7 points, which only slightly exceeds the low-grade threshold.

The analysis of the effects of the results of studies referring to internal diseases were assessed as significant: 3E (summary E). The results of studies in cancer treatment were assessed as 1WE, 2E (summary E) and in neurologic disorders: 4E, 1WE, 1NE (summary E). In total, the results of the review were significant: nine effects (75%), two weak effects (16.67%) and one negative effect (8.33%) (Table 4, Fig. 3).

Discussion

The research into using KT in physical therapy has made considerable progress in recent years, including papers in areas relevant to this review. There are, however, only a few prospective, randomized controlled studies on KT which were conducted on a sufficiently large cohort. In the group which met these criteria, there are only a few papers on using KT in the treatment of internal, oncologic, or neurologic diseases published by Polish and foreign authors in peer review journals with an impact factor. Below we present more detailed areas of possible applications of KT resulting from this systematic review of the literature.

A randomized controlled trial with 63 participants (experimental group $n = 32$; control group $n = 31$ [a standard physical therapy regimen]) investigated the possibility of using KT in internal diseases. It showed that in patients who underwent laparoscopic cholecystectomy

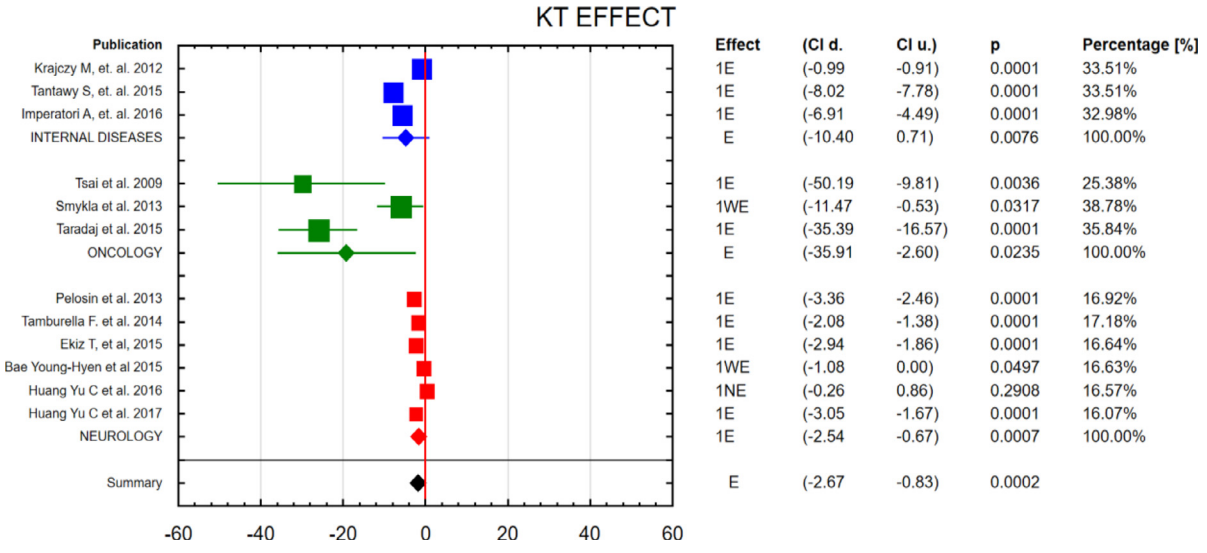

Fig. 2. The effects of the detailed meta-analysis with the D indicator - raw mean difference.

Table 4
Summary of the results.

KT effects	IVS* PEDro	WE**	E**	NE***
KT/internal diseases	$\bar{x}$ 3.33		3	
KT/oncologic diseases	$\bar{x}$ 5.66	1	2	
KT/neurologic diseases	$\bar{x}$ 4.0	1	4	1
Total	$\bar{x}$ 4.33	2	9	1
%		16.67	75	8.33

*IVS: internal validity score (PEDro).
**WE: weak effect.
***E: effect
**** NE: negative effect.

(CHL), the application of kinesiology tape significantly reduced the return time to normal intestinal peristalsis and bowel movement after surgery, significantly reduced the perceived pain, significantly increased physical activity tolerance, and significantly reduced pain relief medication intake.[8] This study was replicated in 2015 in Cairo at the Al. Kaser Al. Aini University Hospital. In a randomized controlled trial with 65 patients (experimental group $n = 32$; control group $n = 33$) who underwent cholecystectomy and appendectomy, pain severity and physical activity tolerance were evaluated using the 2-min walk test and the global impression of change scale (PGIC). The results of the study were statistically significant, which confirms the efficacy of KT applications in post-surgical physical therapy in CHL patients.[9] Imperatori et al. assessed the safety and efficacy of KT in chest pain management after lung lobectomy. On the basis of the results, the authors concluded that KT is a safe and effective adjunct treatment for chest pain management.[13]

Taradaj et al. investigated the effect of KT on the size of lymphedema and manual dexterity of the upper extremity in women who underwent treatment of breast cancer with stage 2 and 3 lymphedema. After a 4-week therapy regimen, the authors concluded that KT is not an effective method of reducing stage 2 and 3 lymphedema in women who underwent breast cancer treatment. At that stage of lymphedema, KT cannot replace conventional and standard multilayered bandaging.[14] Moreover, Smykla et al. assessed the efficacy of KT in treating breast cancer-related lymphedema. The study included 65 women with unilateral, moderate-to-severe lymphedema (stages 2 and 3 of upper limb edema), who were randomly grouped into the KT group (K-tapes, $n = 20$), quasi-KT group (quasi K-tapes, $n = 22$) or MCT group (multi-layered compression therapy group, $n = 23$). The results of the single-blind, controlled pilot study suggest that the K-tape application cannot replace compression bandaging and, consequently, cannot be offered as an alternative for patients with breast cancer-related lymphedema.[15]

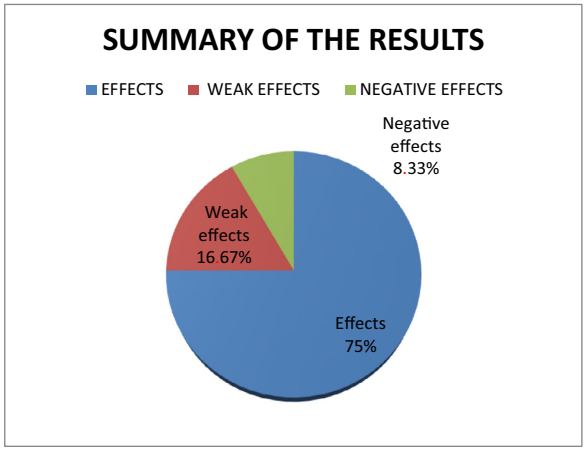

Fig. 3. Graphic representation of the results.

Morris et al. conducted a systematic review of randomized controlled trials (RCTs) to investigate the effect of KT in the management of clinical conditions. The materials for review were gathered (up to March 2012) using the following databases: CINAHL; MEDLINE; OVID; AMED; ScienceDirect; PEDRO; www.internurse.com; SPORTDiscus; British Nursing Index; www.kinesiotaping.co.uk; www.kinesiotaping.com; Cochrane Central Register of Clinical Trials; and ProQuest. The risk of bias and quality of evidence grading was performed using the Cochrane collaboration methodology. One RCT met the full inclusion criteria, and included patients with breast-cancer-related lymphedema. There was limited-to-moderate evidence that KT is no more clinically effective than sham or usual care tape/bandage. Currently, there is insufficient evidence to support the use of KT in clinical practice.[16]

Huang et al. assessed the effects of KT in stroke patients with hemiplegic shoulder pain. The study included 21 stroke patients within 6 months of stroke onset with hemiplegic shoulder pain and was conducted in the rehabilitation ward of a medical university hospital in Taiwan. On the basis of the results, the study concluded that KT can be an alternative treatment option for stroke patients with hemiplegic shoulder pain (HSP).[17] Huang et al. conducted an evaluation of the effects of KT on HSP and the functionality of the upper extremity in ischemic stroke patients with unilateral hemiparesis and hemiplegic shoulder pain, which made effective physical therapy more difficult. The study included 48 patients with unilateral hemiparesis, randomly assigned to one of the following groups: the control group (sham KT) and the experimental group (KT). The results showed that KT does not provide improvements in upper extremity function, daily activity and quality of life compared to conventional inpatient rehabilitation therapy. The authors conclude that KT may limit the development of HSP and improve shoulder flexion in ischemic stroke patients with flaccid shoulders during inpatient rehabilitation.[18] Bae et al. assessed the effects of lower-leg KT application on balance in stroke patients. The study included 30 stroke patients with foot drop, who were randomly assigned to two groups. The experimental group underwent KT application and the control group underwent placebo taping. The authors conclude that KT temporarily improves static balance in stroke patients. However, the study did not verify the effect of KT on dynamic balance. Therefore, the authors suggested conducting further research into the influence of long-term KT on dynamic balance and gait.[19] Ekiz et al. evaluated the effects of KT application on the quadriceps muscle in stroke patients. The study included 24 patients, who were assigned to the following groups: the experimental group and the control group. KT application to the quadriceps muscles administered for 4 weeks, in addition to conventional exercise therapy, has an effect on isokinetic parameters, but not on functional parameters.[20]

Tamburella et al. assessed the effects of KT on spasticity, balance, and gait in spinal cord injury. The study compares the effects of KT and conventional non-elastic silk tape (ST) among the group of 11 patients with chronic spinal cord injury (SCI). The authors conclude that KT application reduces spasticity and pain and improves balance and gait in chronic SCI patients. Although the data is promising, it needs to be confirmed in a larger cohort of patients.[21] Additionally, Pelosin et al. investigated the efficacy of KT in patients with cervical dystonia (CD) and focal hand dystonia (FHD) on self-reported pain (primary objective) and on sensory functions (secondary objective). The study included 25 dystonic patients (14 with CD and 11 with FHD), who were randomly assigned to either 14-day KT treatment or to a sham KT treatment on neck muscles (in CD) or on forearm muscles (in FHD). The results showed that KT caused a decrease in the subjective perception of pain and had a positive effect on sensory discrimination, whereas sham KT had no effect. The authors conclude that KT may be a useful method for treating pain in patients with dystonia.[22]

We found significant quality evidence to support the use of KT in clinical practice in patients with neurologic, oncologic, and internal

diseases. In this systematic review, we found 11 effects of KT applications (9E, 2WE) and one study which did not confirm the efficacy of KT in the relevant areas (1NE). More prospective randomized controlled trials that have a sufficiently large cohort and are based on rigorous scientific evidence and principles of Evidence-Based Medicine (EBM) need to be conducted to explain the mechanism behind KT and to investigate the possibility of using it as therapy method in internal, neurologic, and oncologic diseases.

Conclusions

The research into using KT in physical therapy has made considerable progress in the recent years, including papers on internal, oncologic, and neurologic diseases. However, there are few prospective, controlled randomized trials on KT which include a sufficiently large cohort. Few of the reviewed papers that discuss the principles of KT met the criteria of scientifically rigorous research. Although some significant quality evidence to support the use of KT in clinical practice in patients with neurologic, oncologic, and internal diseases is available, there is still a need for further clinical trials on the effectiveness of the use of KT method.

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References

1. Kase K.*Clinical Therapeutic Applications of the Kinesio (R) Taping Method*. Albuquerque, 2003.
2. Williams S, Whatman C, Hume PA, et al. Kinesio Taping in treatment and prevention of sports injuries. a meta-analysis of the evidence for its effectiveness. *Sports Med*. 2012;42:153. https://doi.org/10.2165/11594960-000000000-00000.
3. Kasawara KT, Mapa JMR, Ferreira V, et al. Effects of Kinesio Taping on breast cancer-related lymphedema: a meta-analysis in clinical trials. *Physiother Theory Pract*. 2018;34(5):337–345. https://doi.org/10.1080/09593985.2017.1419522.
4. Gatt M, Willis S, Leuschner S. A meta-analysis of the effectiveness and safety of Kinesiology Taping in the management of cancer-related lymphoedema. *Eur J Cancer Care (Engl)*. 2017;26(5). https://doi.org/10.1111/ecc.12510.
5. Morris D, Jones D, Ryan H, Ryan CG. The clinical effects of Kinesio® Tex Taping: a systematic review. *Physiother Theory Pract*. 2013;29(4):259–270. https://doi.org/10.3109/09593985.2012.731675.
6. Yang SR, Heo SY, Lee HJ. Immediate effects of Kinesio Taping on fixed postural alignment and foot balance in stroke patients. *J Phys Ther Sci*. 2015;27(11):3537–3540. https://doi.org/10.1589/jpts.27.3537.
7. Toprak Celenay S, Ozer Kaya D. Immediate effects of Kinesio Taping on pain and postural stability in patients with chronic low back pain. *J Bodyw Mov Ther*. 2019;23(1):206–210. https://doi.org/10.1016/j.jbmt.2017.12.010.
8. Krajczy M, Bogacz K, Luniewski J, et al. The influence of Kinesio Taping on the effects of physiotherapy in patients after laparoscopic cholecystectomy. *Sci World J*. 2012;2012: 948282. https://doi.org/10.1100/2012/948282.
9. Tantawy SA, Kamel DM. Effect of Kinesio Taping on pain post laporoscopic abdominal surgery: randomized controlled trial. *IJTRR*. 2015;4:250–255. https://doi.org/10.5455/ijtrr.00000098.
10. Krajczy M, Luniewski J, Bogacz K, Szczegielniak J. Evaluation of applying Kinesio Taping in children with urinary incontinence. *J Pediatr Urol*. 2018;14(6):550.e1–550.e6. https://doi.org/10.1016/j.jpurol.2018.06.013.
11. Parreira PDCS, Costa LDCM, et al. Current evidence does not support the use of Kinesio Taping in clinical practice: a systematic review. *J physiother*. 2014;60(1):31–39. https://doi.org/10.1016/j.jphys.2013.12.008.
12. Lim EC, Tay MG. Kinesio Taping in musculoskeletal pain and disability that lasts for more than 4 weeks: is it time to peel off the tape and throw it out with the sweat? a systematic review with meta-analysis focused on pain and also methods of tape application. *Br J Sports Med*. 2015;49(24):1558–1566. https://doi.org/10.1136/bjsports-2014-094151.
13. Imperatori A, Grande A, Castiglioni M, et al. Chest pain control with Kinesiology Taping after lobectomy for lung cancer: initial results of a randomized placebo-controlled study. *Interact Cardiovasc Thorac Surg*. 2016;23:223–230. https://doi.org/10.1093/icvts/ivw110.
14. Taradaj J, Halski T, Rosinczuk J, et al. The influence of Kinesiology Taping on the volume of lymphoedema and manual dexterity of the upper limb in women after breast cancer treatment. *Eur J Cancer Care (Engl)*. 2016;25:647–660. https://doi.org/10.1111/ecc.12331.
15. Smykla A, Walewicz K, Trybulski R, et al. Effect of Kinesiology Taping on breast cancer-related lymphedema: a randomized single-blind controlled pilot study. *Biomed Res Int*. 2013;2013: 767106. https://doi.org/10.1155/2013/767106.
16. Morris D, Jones D, Ryan H, Ryan CG. The clinical effects of Kinesio Tex Taping: a systematic review. *Physiother Theory Pract*. 2013;29:259–270. https://doi.org/10.3109/09593985.2012.731675.
17. Huang YC, Chang KH, Liou TH, et al. Effects of Kinesio Taping for stroke patients with hemiplegic shoulder pain: a double-blind, randomized, placebo-controlled study. *J Rehabil Med*. 2017;49:208–215. PMID:27575012.
18. Huang Yu C, Leong CP, Wang L, et al. Effect of Kinesiology Taping on hemiplegic shoulder pain and functional outcomes in subacute stroke patients: a randomized controlled study. *Eur J Phys Rehabil Med*. 2016;52:774–781. https://doi.org/10.2340/16501977-2197.
19. Bae YH, Kim HG, Min KS, et al. Effects of lower-leg Kinesiology Taping on balance ability in stroke patients with foot drop. *Evid Based Complement Alternat Med*. 2015;2015:1–5. https://doi.org/10.1155/2015/125629.
20. Ekiz T, Aslan MD, Ozgirgin N. Effects of Kinesio Tape application to quadriceps muscles on isokinetic muscle strength, gait, and functional parameters in patients with stroke. *J Rehabil Res Dev*. 2015:52323–52331. https://doi.org/10.1682/JRRD.2014.10.0243.
21. Tamburella F, Scivoletto G, Molinari M. Somatosensory inputs by application of Kinesio Taping: effects on spasticity, balance, and gait in chronic spinal cord injury. *Front Hum Neurosci*. 2014;30:367. https://doi.org/10.3389/fnhum.2014.00367.
22. Pelosin E, Avanzino L, Marchese R, et al. Kinesio Taping reduces pain and modulates sensory function in patients with focal dystonia: a randomized crossover pilot study. *Neurorehabil Neural Repair*. 2013;27:722–731. https://doi.org/10.1177/1545968313491010.
23. Maher Ch G, Sherrington C, Robert D, et al. Reliability of the PEDro scale for rating quality of randomized controlled trials. *Phys Ther*. 2003;83:713–721. PMID:12882612.
24. Ellis RF, Phty B, Hing WA. Neural mobilization: a systematic review of randomized controlled trials with an analysis of therapeutic efficacy. *J Man Manip Ther*. 2008;16:8–22. https://doi.org/10.1179/106698108790818594.