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Does the patients' expectations on kinesiotape affect the outcomes of patients with a rotator cuff tear? A randomized controlled clinical trial

Yildiz Analay Akbaba[1], Ebru Kaya Mutlu[1], Suleyman Altun[2] and Derya Celik[1]

Abstract

Objective: To investigate the effect of setting expectations verbally on the effectiveness of kinesiotape application in patients with a rotator cuff tear.
Design: Randomized controlled, double-blind study.
Setting: Department of Physiotherapy and Rehabilitation.
Subjects: Eighty-nine patients with rotator cuff tear.
Intervention: Patients were randomized according to the verbal input given to patients about the effectiveness of kinesiotaping; Group 1 (there is no evidence that kinesiotaping is effective), Group 2 (there is limited evidence that kinesiotaping is effective), and Group 3 (there is evidence that kinesiotaping has an excellent effect).
Main measures: Resting pain, activity pain, and night pain were assessed by visual analog scale. Range of motion was assessed by a universal goniometer. Function was evaluated by the Disabilities of the Arm, Shoulder and Hand Questionnaire and the American Shoulder and Elbow Surgeons Standardized Shoulder Assessment Form before and 24 hours after kinesiotape application. Only resting pain and activity pain were assessed after 30 minutes.
Results: There were no statistically significant differences (ANOVA) between any groups at the three assessment points. The intragroup assessment showed that in Group 2, only resting pain after 30 minutes improved (3.2 ± 2.9 to 2.6 ± 2.8; $P = 0.02$). An improvement in resting pain both after 30 minutes and after 24 hours was found in the third group (4.1 ± 2.4 to 2.3 ± 2.3, $P = 0.001$; 4.1 ± 2.4 to 2.2 ± 2.3, $P = 0.001$, respectively). Activity pain and night pain were improved in all groups after 24 hours.
Conclusion: Setting positive expectations verbally about kinesiotaping might be effective in reducing pain in patients with rotator cuff tear.

Keywords

Kinesiotaping, expectation, pain, function, shoulder

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[1]Division of Physiotherapy and Rehabilitation, Faculty of Health Sciences, Istanbul University, Istanbul, Turkey
[2]Department of Orthopaedics and Traumatology, Bakırköy Dr. Sadi Konuk Training and Research Hospital, Istanbul, Turkey

Corresponding author:
Yildiz Analay Akbaba, Assistant Professor, Division of Physiotherapy and Rehabilitation, Faculty of Health Sciences, Istanbul University, Demirkapi Cad, Karabal Sk., Bakırköy, 34740 Istanbul, Turkey.
Emails: yildizanalay@yahoo.com; yildizanalay@istanbul.edu.tr

Introduction

Kinesiotaping has become a popular conservative treatment method for many musculoskeletal disorders, such as rotator cuff pathologies, patellofemoral pain syndrome, osteoarthritis, and back pain.[1,2] There are several proposed benefits of kinesiotaping, including proprioceptive neuromuscular facilitation, pain inhibition, improved healing through reduce swelling, a decrease in muscle fatigue and pain and support during movement.[3–5] However, there is conflicting evidence regarding its efficacy.

Although there is only an immediate effect on pain, which is not clinically meaningful, why is kinesiotaping popular worldwide? It might be patient expectations. Patient expectations have been proposed to play an important role in the "placebo effect."[6,7] The relevance of patients expectations on health outcomes has received increasing attention in recent years. Much evidence suggests that expectations influence treatment outcome in patients with various medical conditions. For instance, they have been linked to course and treatment outcome in patients with musculoskeletal disorders[8,9] and injuries.[10] Thus, patients with more positive expectations appear to be more likely to benefit from medical treatment across medical conditions.

The expectancies may be driven by multiple factors, including the patient's own preconceived notions or the words used by clinicians.[11,12] It is reasonable to believe that mentally well-prepared patients who have given positive verbal input may develop more favorable expectations (placebo effect) than patients who have been given more negative verbal input (nocebo effect). Although various clinical studies on the topic in different pathologies have provided considerable evidence supporting this belief.[13,14] Surprisingly, no research has focused on the patients' expectations with kinesiotape application.

We believe that challenging problems, such as rotator cuff pathology, can be treated with a more comprehensive treatment method, although kinesiotaping is not one of these methods. However, patient beliefs or expectations about any treatment method that can cure them is a large part of healing. In addition, the healing effect might be related to the patient's perspective about kinesiotaping due to common and effective advertisements and patient beliefs. It is not known how much patient expectancies affect outcomes. Thus, we hypothesized that positive verbal input (placebo effect) would be more effective than neutral and negative verbal input (nocebo effect) in patients with rotator cuff tears. The aim of our study was to investigate the effect of setting expectations verbally on the effectiveness of kinesiotape application in patients with a rotator cuff tear.

Methods

Trial design

This clinical study was designed as a prospective, randomized, double-blind study. This study was performed at Istanbul University. The research protocol was designed according to the CONSORT guidelines (see CONSORT checklist) and was approved by the Research Ethics Committee of the by the Ethical Committee at Bakırköy Dr. Sadi Konuk Education and Research Hospital (institutional review board approval no: 2015-280). The study was conducted in accordance with the Declaration of Helsinki. Informed consent was provided to all patients prior to their enrollment in the study. The trial was registered at ClinicalTrials.gov, number NCT03073655.

Participants

One hundred and ten participants were recruited from Bakırköy Dr. Sadi Konuk Education and Research Hospital and treated at Istanbul University from January 2016 to January 2017. Patients were diagnosed by an orthopedic surgeon (S.A.) who specialized in shoulder pathologies. Patients were included if they had a partial rotator cuff tear, magnetic resonance imaging (MRI) evidence of rotator cuff tear, a symptom duration of at least three months, no radiographic signs of fracture of the glenoid or greater or lesser tuberosity, an absence of shoulder instability, an insufficient response to nonoperative management (including local corticosteroid injection, nonsteroid anti-inflammatory drugs, rest and

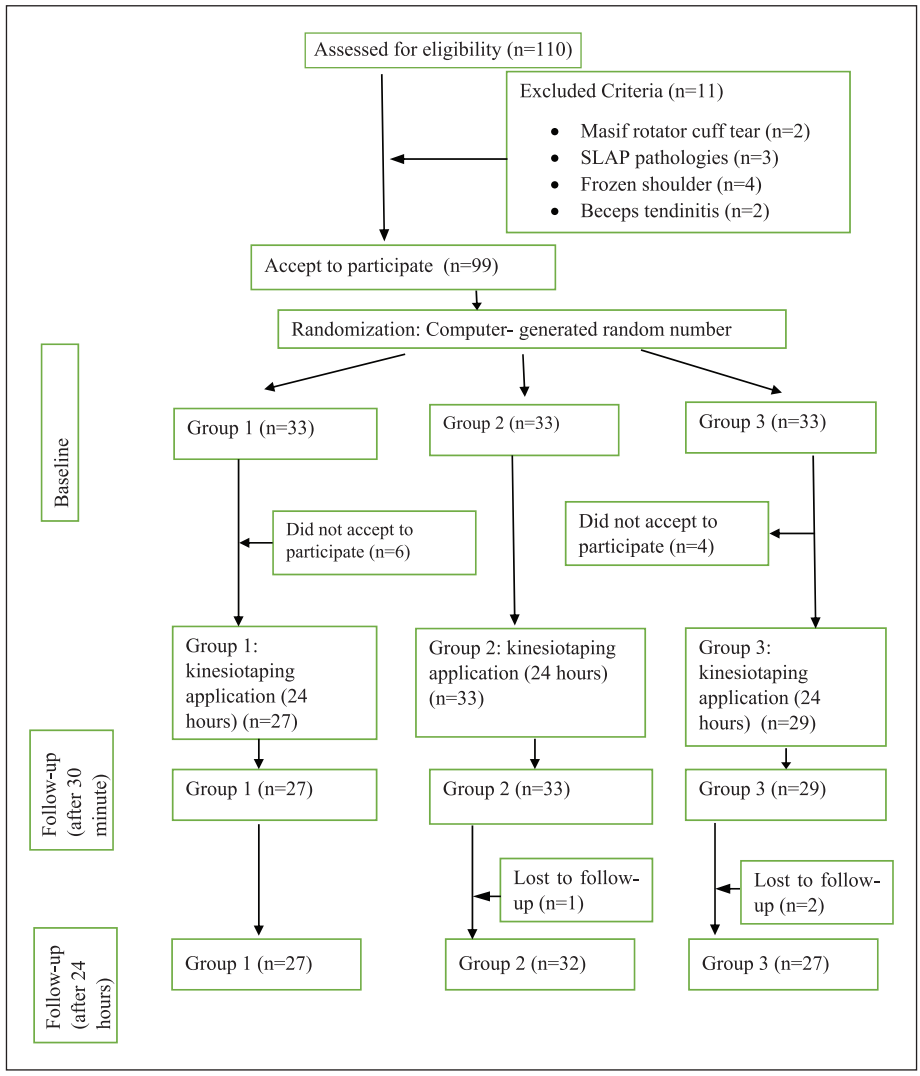

Figure 1. Flow diagram of the study.

physical therapy), a positive Hawkins–Kennedy test,[15] and a positive empty can test.[16] In addition, subjects had to be 18–50 years of age and to have failed to perform daily life activities. Patients were excluded if they had inflammatory joint disease, rheumatologic disease, osteoarthritis of the humerus head, prior surgery on the affected shoulder, or an inability to complete questionnaires because of a language problem or cognitive disorder. Patients who did not accept the invitation to participate and patients who did not come to the second evaluation were also excluded.

Randomization and blinding

The participants were randomized into one of three intervention groups (ratio 1:1:1) using "Research Randomizer," an online randomization web service (https://www.randomizer.org/): Group 1 ($N=33$), Group 2 ($N=33$) and Group 3 ($N=33$) (Figure 1).

Simple randomization procedures (computerized random numbers) were performed, and sequentially, numbered index cards containing the random assignments were prepared by an investigator (D.C.) with no clinical involvement in the study to ensure allocation concealment. The index cards were folded and placed into sealed envelopes, which were blind to the groups. Next, the physiotherapist (Y.A.A.) performing the interventions opened each envelope and divided the participants into the groups according to the selected index card. The interventions were performed by the same physiotherapist at a university research clinic. The evaluations were performed by another physiotherapist (E.K.M.), who did not know which participants belonged to each group (assessor-blinded), before, 30 minutes after and 24 hours after kinesiotape application. The participants were blinded to their assigned group.

Outcome measures

Pain intensity was assessed using the visual analog scale. Each patient was asked about the pain during rest (visual analog scale-rest), during activities of daily living (visual analog scale-activity), and at night during sleeping (visual analog scale-night).[17] The visual analog scale rating was the primary outcome measurement. Pain-free active and passive shoulder forward flexion, abduction, and scapular plane external–internal rotation range of motion were assessed using a standard goniometer.[18] Function was assessed by the Disability of the Arm, Shoulder and Hand Questionnaire[19] and the American Shoulder and Elbow Surgeons Standardized Shoulder Assessment Form.[20,21]

Follow-up

Rest and activity pain were assessed before kinesiotaping (first assessment) and 30 minutes after (second assessment). In addition, night pain, the range of motion, the Disability of the Arm, Shoulder and Hand Questionnaire, and the American Shoulder and Elbow Surgeons Standardized Shoulder Assessment Form were assessed after 24 hours (third assessment) in all patients. The kinesiotape was applied only one time.

Interventions

The verbal input was determined by the group allocation. Patients were randomly divided into three groups: Group 1 (there is no evidence that kinesiotaping is effective; nocebo effect), Group 2 (there is limited evidence that kinesiotaping is effective; neutral effect), and Group 3 (there is evidence that kinesiotaping has an excellent effect; placebo effect). All patients received the same standardized therapeutic kinesiotape application. The researcher who applied the kinesiotape was a certified practitioner who was blinded to the group assignment. Kase et al.[22] and Thelen et al.[23] suggested that the general application method was the proper protocol for rotator cuff pathologies. For all applications in all groups, standard 5 cm kinesiotape was used.

Subjects taking nonsteroidal anti-inflammatory drugs or analgesics were instructed to avoid doing so for the duration of the study (only for 24 hours). Subjects were instructed to wear the kinesiotape for 24 hours and to return to the clinic for re-evaluation. Subjects were advised to remove the kinesiotaping prior to the prescribed time only if any persistent skin irritation or increased shoulder discomfort occurred.

Data analysis

Sample-size calculation was based on the clinically important improvement of 20 mm points on a 0-to-10 visual analog scale for pain, with a standard deviation of 25 mm points. Assuming a 95% confidence interval and power of 80%, the resulting sample size was 26 participants per group, for 78 in total.[24] The estimated drop-out rate, based on previous studies, was 25%; therefore, the required number of patients for recruitment was 99.

Baseline demographic data were compared between treatment groups using analysis of variance (ANOVA) for continuous data and the chi-square test of independence for categorical data to assess the adequacy of the randomization.

Table 1. Baseline demographics of groups.

	Group 1 ($n=27$)	Group 2 ($n=33$)	Group 3 ($n=29$)	P
Age (year)	54.15 (10.22)	50.03 (10.22)	48.86 (10.03)	0.13[a]
Sex (female/male)	18/9	22/11	17/12	0.76[b]
BMI (kg/m^2)	28.67 (5.58)	29.37 (5.77)	29.88 (5.31)	0.72[a]
Duration of symptoms (months)	13.76 (28.24)	12.85 (16.52)	9.41 (10.30)	0.72[a]
Educational level	n[c] (%)	n[c] (%)	n[c] (%)	
Primary	20 (75.1)	21 (67.2)	22 (75.9)	0.34[b]
Secondary	4 (14.8)	2 (6.1)	4 (13.8)	
High	1 (3.7)	6 (18.2)	0 (0)	
University	2 (7.4)	3 (9.1)	3 (10.3)	

BMI: body mass index; ANOVA: analysis of variance.
Values are mean ± SD.
[a]One-way ANOVA.
[b]Chi-square test.
[c]Indicates that the number of subjects.

The effects of treatment on visual analog scale-rest and visual analog scale-activity were analyzed using a 3-by-3 mixed-model repeated measures ANOVA with treatment group (Groups 1–3) as the between-subject factor and time (before, 30 minutes after and 24 hours after of kinesiotaping) as the within-subject factor. Visual analog scale-night, range of motion, the American Shoulder and Elbow Surgeons Standardized Shoulder Assessment Form and the Disability of the Arm, Shoulder and Hand Questionnaire were analyzed using a 3-by-2, mixed-model repeated measure ANOVA with treatment group (Groups 1–3) as the between-subject factor and time (before and after 24 hours) as the within-subject factor. Intention-to-treat analysis was performed with missing data, which were computed using regression equations. Before and 24 hours after kinesiotaping, values within the groups were compared using the paired-sample t-test in dependent groups.

In addition, the results before and after the kinesiotaping were directly compared with reported minimum clinically important differences (MCIDs) in the literature. Established MCIDs for the visual analog scale, the American Shoulder and Elbow Surgeons Standardized Shoulder Assessment Form and the Disability of the Arm, Shoulder and Hand Questionnaire have been suggested as 20 mm, 6.4 and 10.2 point, respectively.[25–27] Effect sizes were determined by calculating the differences in the means of the baseline and the follow-up data divided by the standard deviation at the baseline; effect sizes of 0.2, 0.5, and 0.8 were considered small, moderate, and large, respectively.[28,29] Data analyses were performed using the SPSS version 20.0 statistical software package (SPSS Inc., Chicago, IL, USA). Statistical significance was set for all tests at $P<0.05$.

Results

Ninety-nine patients (mean ± SD age, 50.92 ± 10.28 years; 57 (64%) females) met all of the inclusion criteria. Eighty-nine patients received the allocated intervention. The mean duration of the symptoms was 11.77 ± 18.50 months. All baseline demographic traits were similar between groups ($P>0.05$) (Table 1).

The group-by-time interaction for the 3-by-3 mixed-model repeated measure ANOVA was not statistically significant between the three groups in visual analog scale-rest or visual analog scale-activity (Table 2). In addition, there was no significant difference between the three groups in visual analog scale-night, range of motion, the American Shoulder and Elbow Surgeons Standardized Shoulder Assessment Form or the Disability of the Arm, Shoulder and Hand Questionnaire using the

Table 2. Comparison of pain within group and between groups.

Assessment	Baseline	After 30 minutes		Efect size	P^a	P^b	One day		Effect size	P^c	P^d
	Mean	Mean	Within-group score change				Mean	Within-group score change			
VAS-rest											
Group 1	2.9 ± 2.8	2.5 ± 2.5	0.4 ± 1.9	0.14	0.33	0.79	3.2 ± 3.1	−0.3 ± 2.4	0.10	0.58	0.97
Group 2	3.2 ± 2.9	2.6 ± 2.8	0.6 ± 1.5	0.20	0.02		2.7 ± 3.0	0.5 ± 2.3	0.17	0.21	
Group 3	4.1 ± 2.4	2.3 ± 2.3	1.7 ± 1.4	0.70	0.001		2.2 ± 2.3	1.8 ± 1.7	0.75	0.001	
VAS-activity											
Group 1	7.1 ± 2.6	5.7 ± 2.6	1.4 ± 2.1	0.53	0.02	0.70	6.1 ± 2.8	0.9 ± 1.9	0.34	0.02	0.67
Group 2	7.2 ± 2.2	5.3 ± 2.8	1.9 ± 2.1	0.86	0.002		5.8 ± 2.6	1.4 ± 2.3	0.63	0.002	
Group 3	7.0 ± 2.3	4.7 ± 2.5	2.6 ± 2.4	1.13	0.001		5.3 ± 2.4	1.8 ± 1.8	0.78	0.001	
VAS-night											
Group 1	6.7 ± 2.9	–	–	–	–	–	4.9 ± 3.2	1.7 ± 2.6	0.58	0.005	0.30
Group 2	6.9 ± 3.2	–	–	–	–		5.9 ± 3.2	1.4 ± 2.9	0.75	0.001	
Group 3	5.8 ± 3.4	–	–	–	–		3.6 ± 3.4	2.3 ± 2.6	0.67	0.001	

VAS: visual analog scale.

Values are expressed as mean ± SD for within- and between-group score changes.

[a]Indicates a statistical significance of within the groups from the baseline to the after 30 minutes kinesiotaping applications (paired-sample *t*-test).

[b]Indicates a statistical significance of between-group differences from the baseline to the after 30 minutes kinesiotaping applications (3-by-2, mixed-model repeated measures analysis of variance (ANOVA).

[c]Indicates a statistical significance of within the groups from the baseline to the after 24 hours kinesiotaping applications (paired-sample *t*-test).

[d]Indicates a statistical significance of between-group differences from the baseline, to after 30 minutes and to 24 hours after kinesiotaping applications (3-by-3, mixed-model repeated measures ANOVA).

group-by-time interaction for 3-by-2 mixed-model repeated measure ANOVA (Tables 2–4).

The intragroup assessment showed that in Group 2, only visual analog scale-rest after 30 minutes improved ($P = 0.02$). An improvement in pain both after 30 minutes and at one day of assessment was predominantly found in the third group ($P = 0.001$, $P = 0.001$, respectively). Visual analog scale-activity and visual analog scale-night were improved in all groups after 24 hours. In addition, there was a statistical difference for visual analog scale-activity after 30 minutes in all groups (Table 2).

However, flexion range of motion was increased in only Group 3 after 24 hours ($P = 0.02$) (Table 3). The Disability of the Arm, Shoulder and Hand Questionnaire and the American Shoulder and Elbow Surgeons Standardized Shoulder Assessment Form were improved in both Groups 2 and 3 after 24 hours (Table 4). Small but clinically important differences were found for visual analog scale-activity (after 30 minutes) and visual analog scale-night only in Group 3, whose expectations were that kinesiotaping would have an excellent effect (Table 2).

Discussion

We investigated the effects of setting expectations in patients with rotator cuff tears treated with kinesiotaping, and we found that setting positive or neutral expectations had a short-term effect on pain and function outcomes. Clinicians often play a pivotal role in shaping expectations, in both the positive and negative directions.[30] Rief et al.[31] reported that enhancing positive expectations improves the clinical outcomes in invasive medical interventions, such as coronary artery bypass surgery. The authors provided positive expectations for the benefit of surgery and recovery.[31] After six months, the

Table 3. Comparison of range of motion within group and between groups.

Assessment	Group	Baseline	One day		Effect size	P^a	P^b
		Mean	Mean	Within-group score change			
Flexion ROM	Group 1	139.2 ± 23.1	139.8 ± 23.9	0.8 ± 19.8	0.03	0.83	0.66
	Group 2	145.2 ± 26.9	144.6 ± 28.5	−0.6 ± 12.2	0.02	0.77	
	Group 3	140.4 ± 24.7	147.5 ± 24.2	7.1 ± 16.2	0.28	0.02	
Abduction ROM	Group 1	129.0 ± 37.9	123.9 ± 40.1	−6.6 ± 24.6	0.17	0.18	0.90
	Group 2	131.4 ± 37.5	130.7 ± 34.1	−0.7 ± 15.1	0.01	0.80	
	Group 3	127.5 ± 32.3	132.1 ± 31.5	4.5 ± 28.2	0.13	0.39	
External rotation ROM	Group 1	61.6 ± 16.3	59.6 ± 14.5	−3.1 ± 11.7	0.19	0.19	0.98
	Group 2	61.0 ± 22.3	62.3 ± 20.9	1.3 ± 9.9	0.05	0.45	
	Group 3	61.5 ± 23.4	62.7 ± 22.6	1.2 ± 9.9	0.05	0.51	
Internal rotation ROM	Group 1	78.8 ± 12.2	82.2 ± 16.6	3.6 ± 10.8	0.29	0.09	0.81
	Group 2	79.0 ± 15.0	78.1 ± 15.8	−0.9 ± 6.7	0.06	0.45	
	Group 3	77.5 ± 19.6	77.9 ± 17.7	0.4 ± 6.5	0.02	0.73	

ROM: range of motion.
Values are expressed as mean ± SD for within- and between-group score changes.
[a]Indicates a statistical significance of within the groups from the baseline to the after 24 hours kinesiotaping applications (paired-sample *t*-test).
[b]Indicates a statistical significance of between-group differences from the baseline to the after 24 hours kinesiotaping applications (3-by-2, mixed-model repeated measures analysis of variance (ANOVA).

Table 4. Comparison level of function within group and between groups.

Assessment	Group	Baseline	One day		Effect size	P^a	P^b
		Mean	Mean	Within-group score change			
DASH	Group 1	51.2 ± 18.6	51.1 ± 19.0	0.04 ± 5.6	0.005	0.96	0.31
	Group 2	47.8 ± 20.6	44.3 ± 22.4	3.62 ± 8.6	0.17	0.02	
	Group 3	45.8 ± 19.1	40.4 ± 19.7	5.38 ± 10.1	0.28	0.008	
ASES	Group 1	47.4 ± 20.9	48.5 ± 21.0	0.05 ± 3.6	0.05	0.94	0.46
	Group 2	50.3 ± 20.6	54.4 ± 23.1	4.16 ± 9.1	0.20	0.01	
	Group 3	51.5 ± 18.4	59.5 ± 20.7	7.88 ± 12.4	0.42	0.002	

DASH: The Disability of the Arm, Shoulder and Hand Questionnaire Scores; ASES: The American Shoulder and Elbow Surgeons Standardized Shoulder Assessment Form.
Values are expressed as mean ± SD for within- and between-group score changes.
[a]Indicates a statistical significance of within the groups from the baseline to the after 24 hours kinesiotaping applications (paired-sample *t*-test).
[b]Indicates a statistical significance of between-group differences from the baseline to the after 24 hours kinesiotaping applications (3-by-2, mixed-model repeated measures analysis of variance (ANOVA).

results showed that these patients reported a lower disability and higher quality of life.[31] Moreover, the relationship between patient expectations and outcomes related to the management of musculoskeletal pain conditions has been shown in many clinical studies.[32] Linde et al.'s[13] study of the efficacy of acupuncture in comparison to placebo acupuncture for musculoskeletal pain found that pain outcomes depended not upon which intervention participants received (acupuncture vs. sham

acupuncture), but upon their expectations for acupuncture. In addition, the only study of high quality was by Thelen et al.,[23] and it assessed pain by visual analog scale, comparing kinesiotaping versus placebo kinesiotaping on the first, third, and sixth day of kinesiotape application. Pain was not significant in any time interval, with the exception of a significant difference on the first day of the treatment group, which did not meet the threshold of a clinically meaningful change.

In our study, the patients given both positive and neutral expectations improved more in pain assessment. Neutral expectations, including either positive or negative expectations, were also effective in reducing pain. Because neutral expectations also give a 50% hope for healing, patients who received even neutral expectations had better outcomes than those with negative expectations. We propose that patient expectations are very important and have the same treatment effect. There is clear evidence from research on placebo on pain showing that in principle, expectations can modify pain perception in the brain. Expectations associated with the application of placebos activate endogenous opioid systems; however, non-opioid pathways are also likely to play an important role.[33] Expectations of clinical benefit seem to be a major mechanism of placebo effects.

We propose that effective advertisements and patient beliefs underlie this placebo effect. Positive expectations (placebo effect) and negative expectations (nocebo effects) can be learned through social conditioning.[34,35] The observation of positive effects in other people induces substantial placebo analgesic responses and these are positively correlated with empathy. Kinesiotape advertisements attract the attention of patients, and their expectations are affected in a positive way, unlike the negative expectations given to the patients in this study.

It has been thought that kinesiotaping increases blood circulation under the taped area, which may lead to a series of physiological changes in the muscle that facilitates the range of motion.[36] However, these proposed effects need to be proven. The range of motion usually decreases due to pain in rotator cuff pathologies. We propose that when pain subsides, range of motion starts to slowly increase in the early phase of the pathology. Shakeri et al.[37] compared placebo versus kinesiotaping and reported no difference in the range of motion measures ($P > 0.05$) immediately and after one week.

Thelen et al.[23] assessed the effects of kinesiotaping on the shoulder range of motion in patients diagnosed with subacromial impingement syndrome. The difference on the third day was not significant between the kinesiotaping and sham groups. The authors concluded that the kinesiotaping has a small and immediate effect on pain-free shoulder abduction but is unlikely to have a beneficial effect in the long term.[23] In this study, we found a $7.1° \pm 16.2°$ flexion range of motion increase in Group 3, which is also not clinically important. It may be a small percentage, but it suggests that although adherence played a small role, one or more other pathways could explain the relationship between what patients expect and their outcomes. These might include the possibility that patients who expect positive outcomes are more likely to observe a small increase in recovery while they ignore negative outcomes.

The improvement in function is mostly dependent on the improvement in the range of motion and pain. Some studies indicate that there is no significant improvement of function after application of kinesiotape.[23,38–40] However, only two studies found that kinesiotaping has positive results on function.[37,41] Only Şimşek et al.[41] compared patients randomly assigned to a standardized therapeutic kinesiotaping group to those assigned to a placebo of neutral kinesiotaping using the Disability of the Arm, Shoulder and Hand Questionnaire. The kinesiotaping group showed a significant improvement on the 5th and 12th days of kinesiotape application.[41] Mahomed et al.[8] indicated that patient expectations were crucial independent predictors of improved functional outcomes and satisfaction following total joint arthroplasty. On the other hand, the present study showed that there was no difference in functional assessment between groups. Our study may not have had the statistical power to detect an overall difference between all three groups using ANOVA. For this reason, although the patient

expectations on kinesiotaping did not alter the effects on function in our three groups, intragroup changes showed that patients with positive or neutral expectations were more likely to report better function than patients given negative expectations.

Finally, although the groups were not significantly different, most of the outcomes were better in the group given positive expectations. Despite widespread use of kinesiotape in many pathologies, the evidence of the efficacy of kinesiotape is very weak. We propose that kinesiotape advertisements attract the attention and increase the expectations of patients. There remains much to learn about the mechanisms linking expectations and outcomes in clinical situations.

This study had several strengths. First, it was a double-blind, randomized controlled trial. Second, our large sample size enabled us to control for potential confounders. Third, this study is the first to report the relationship between patient beliefs or expectations and the effectiveness of kinesiotaping. Many researchers have investigated positive or negative expectations, but none of the researchers used neutral expectations, whereas we did.

Our study also has some limitations. First, we asked the patients not to take any analgesics or nonsteroidal anti-inflammatory drugs during the kinesiotape application, which was approximately 24 hours. However, we could not verify this and had to believe their assurance. Second, there was no true control group, which could have provided a control for the condition's natural healing process.

Clinicians have long been aware of the placebo effect and of the influence of patient expectations. Patient expectations of outcomes are crucial to the success of rehabilitation and linked to levels of pain and recovery.[42] On the basis of such evidence, most clinicians would probably agree that patients' positive expectations may influence outcome measurements. The clinical implication of our study is that expectations can effectively improve pain and function in patients with rotator cuff tears. Future research should aim to investigate the effects of setting patient expectations in other musculoskeletal disorders.

Clinical messages

- This study provides evidence that expectations have an effect on short-term (24 hours) outcomes in patients with rotator cuff tears treated with kinesiotaping.

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ORCID iD

Yildiz Analay Akbaba https://orcid.org/0000-0002-8141-6977

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