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The role of Kinesio taping in enhancing functional performance among patients with musculoskeletal impairments

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ABSTRACT

Introduction: Musculoskeletal disorders (MSDs) are among the leading causes of disability worldwide, often resulting in pain, loss of function, and reduced quality of life. Kinesio Taping (KT) has been proposed as a supportive, noninvasive technique to enhance rehabilitation outcomes by improving neuromuscular activation, proprioception, and circulation. This research aims to evaluate the effect of KT on upper-limb functional improvement in patients with MSDs undergoing standard physiotherapy.

Methods: This prospective interventional study included 57 participants divided into a control group receiving conventional physiotherapy and an experimental group receiving additional KT. Functional status was assessed using the Upper Extremity Functional Index (UEFI) at 3 time points: before therapy, mid-treatment, and after therapy. Statistical analyses included the Mann–Whitney U test, Kruskal–Wallis test, and multiple linear regression.

Results: At baseline, the KT group had significantly lower functional scores (median 24.0, Interquartile Range [IQR] 19.0–27.0) than controls (median 35.0, IQR 25.0–47.0; $p = 0.02$). During treatment, both groups improved, but the KT group demonstrated faster functional recovery ($p = 0.033$). At completion, both groups achieved similar UEFI scores; however, the total functional gain was nearly twice as high in the KT group (21.5 vs. 12.5 points). Relative improvement reached 90% in the KT group compared with 36% in controls. Regression analysis confirmed that KT application was a significant predictor of upper-limb functional improvement ($\beta = 0.552$, $p = 0.002$).

Conclusion: KT significantly accelerates upper-limb functional recovery and enhances rehabilitation outcomes when used as an adjunct to physiotherapy. Its simplicity, safety, and cost-effectiveness make it a valuable addition to standard musculoskeletal rehabilitation.

Keywords: Kinesio taping; musculoskeletal disorders; upper extremity; functional recovery; physiotherapy

INTRODUCTION

The health of the musculoskeletal system is essential for human functioning, mobility, dexterity, and independence throughout life (1). Musculoskeletal disorders (MSDs) encompass a wide range of acute and chronic conditions affecting muscles, tendons, ligaments, joints, nerves, and supporting blood vessels. They represent a major global health and economic burden (2). MSDs are defined as “pain or injury to the human support system” resulting from damage to muscles, bones, ligaments, or tendons, which can impair daily activities and reduce overall function (3). More than 150 different diseases and syndromes fall within this group, typically associated with pain, stiffness, and reduced functional ability (4). These include acute soft-tissue injuries, myofascial pain syndrome, fibromyalgia, arthritis, neurological conditions, and post-operative orthopedic rehabilitation problems (5).

Epidemiological studies show that the prevalence of MSDs in developing countries is comparable to that in industrialized nations, although complications are often more frequent due to limited access to care (6). Depending on the affected body region and assessment tools, prevalence rates commonly exceed 30%. Risk factors include repetitive movements, awkward postures, high work pace, exposure to vibration or extreme temperatures, and insufficient recovery time. Biomechanical loading, tissue changes, and stress-related neurohormonal mechanisms are key etiological pathways (7). MSDs are widespread across all age groups and social strata and are the leading cause of long-term

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pain and disability worldwide, affecting one in four adults in Europe (8). They significantly limit daily activities and quality of life, including self-care, mobility, and work performance (9-11).

Functional limitations are defined as the restriction or inability to perform activities within a normal range and are considered key indicators in MSD assessment. They depend primarily on individual rather than environmental factors and often precede the development of disability (12). According to the Global Burden of Disease study, MSDs accounted for about 16% of all disability worldwide in 2017, with low back pain remaining the leading cause since 1990. Between 20% and 33% of the world's population live with some form of MSD (13).

Treatment strategies for MSDs conventionally focus on reducing pain and preventing further tissue damage (14). Among newer approaches, Kinesio Taping (KT), developed by Dr. Kenzo Kase in the 1970s, was designed to support musculoskeletal structures without restricting movement (15). Initially used in arthritis patients, KT has become common in rehabilitation and sports medicine. Despite its popularity, scientific evidence on its efficacy remains limited due to the small number of randomized controlled trials (16). KT is made of elastic, latex-free cotton fabric that stretches up to 140% of its original length, allowing unrestricted motion and continuous wear for several days (17).

KT mimics the thickness and elasticity of human skin (18). By lifting the skin from the underlying fascia, it enhances local blood flow and lymphatic drainage, reduces inflammation, and may alter sensory feedback (19). Mechanical effects depend on the tape's tension – compression can stimulate mechanoreceptors, while decompression may reduce inflammation and pressure on pain receptors (20). Recent evidence suggests that KT may also improve neuromuscular activation, proprioception, and postural stability, contributing to functional recovery in patients with MSDs. The growing burden of MSDs is closely related to aging, obesity, and sedentary lifestyles. Prevalence is expected to rise further in developing countries, making prevention and early intervention priorities in public health strategies (21). Approximately half of the adults experience musculoskeletal symptoms during their lifetime, and up to 45% develop chronic forms (22). MSDs are the leading cause of long-term sick leave in several Western countries and should be addressed through a biopsychosocial model that includes safe environments, physical activity, and early identification of at-risk individuals (23,24).

When used in rehabilitation or injury prevention, KT is a cost-effective, safe, and easily applicable technique. It may improve functional performance, coordination, and postural control, while allowing continued activity between therapy sessions (25,26). These features make KT a valuable adjunct in the management of MSDs, especially for enhancing functional outcomes and reducing disability.

This study aims to evaluate the effect of KT on functional improvement in patients with MSDs, assessing its potential to enhance motor performance, daily functional capacity, and postural control compared with standard rehabilitation approaches.

METHODS

The study is designed as a prospective, randomized clinical trial using a descriptive–analytical approach, based on data collected during a doctoral research project that included 123 patients of both sexes and various age groups treated at the Public Health Institution "Health Center of Sarajevo Canton," Organizational Unit Novi Grad – Otoka. All participants were referred for physical therapy by specialist physicians due to diagnosed MSDs of the upper extremities. Of the total cohort, 57 patients (46.7%) with upper-limb MSDs were included in the present analysis.

The study, titled "Effectiveness of the Kinesio Tape Technique in the Treatment of Musculoskeletal Disorders," was approved by the Ethics Committee of the Public Health Institution "Health center of Sarajevo Canton" (protocol no. 01-06-3326-5/20, May 28, 2020). The research was conducted between May 2020 and July 2022, in accordance with the ethical principles of the Declaration of Helsinki. Written informed consent was obtained from all participants or their legal guardians before inclusion. This research forms part of the doctoral dissertation from which an earlier publication in the *Journal of Health Sciences* (27) was derived. While the previous paper focused on pain reduction, the present analysis investigates the effect of KT on functional improvement in the same study population.

After the initial clinical assessment and obtaining written informed consent, participants were allocated to study groups using stratified randomization. Group assignment was performed at the medical records office using an even–odd numbering method, ensuring equal probability of allocation. Patients assigned an even number were allocated to the control group, while those assigned an odd number were allocated to the experimental group.

The control group received the standard rehabilitation protocol for MSDs, while the experimental group received the same standard protocol supplemented with KT applied to the affected segment. Functional status was assessed in both groups at baseline, during treatment, and after completion of the rehabilitation program using the study instruments.

All participants underwent a standard rehabilitation program that included physiotherapeutic and kinesiotherapeutic procedures such as ultrasound, magnetotherapy, interferential current (interferential stimulation), transcutaneous electrical nerve stimulation, manual or cryo massage, hot packs, and active or assisted exercises for strengthening and mobility. The Kinesio group received this standard protocol supplemented with KT applied to the affected upper limb. Tape application followed the method of Wallis and Kase (25). For muscle facilitation, the tape was applied from insertion to origin; for inhibition, from origin to insertion. Depending on the treatment goal, I, Y, or X configurations were used. The skin was cleaned and dried before application, with edges rounded to prevent detachment. Adhesion was activated by light rubbing, and heat sources or electrotherapy was avoided afterward.

Tapes were removed with non-irritating oil in the direction of hair growth (26). An original, certified Kinesio Tape (KinesioTex® Classic 2 Tape, Class I Medical Device, approved by the Agency for Medicines and Medical Devices of Bosnia and Herzegovina, no. 06-07.4-1-5287-5/22) was used in all cases. Functional performance of the upper limb was evaluated using the Upper Extremity Functional Index (UEFI). This 20-item self-report questionnaire assesses the ability to perform daily activities using a 5-point Likert scale (0 = unable to perform; 4 = no difficulty). Total scores range from 0 to 80, with higher scores indicating better function. A minimum change of 9 points is considered clinically meaningful. Additional clinical measurements included joint range of motion (measured by goniometer) and muscle circumference (measured by non-elastic tape) to monitor mobility and recovery throughout therapy (28). All assessments were performed before, during, and after the intervention period. The longitudinal design with repeated measurements allowed each participant to serve as their own reference over time, reducing the influence of baseline functional imbalance between groups.

Data were entered into Microsoft Excel 365 and analyzed using IBM SPSS Statistics 27.0 (IBM Corp., Armonk, NY, USA). Continuous variables were presented as mean ± standard deviation (SD) for normally distributed data or as median (interquartile range [IQR]) for non-parametric data. Group differences were analyzed using the t-test or the Mann–Whitney U test. Changes in functional scores (UEFI) over time were assessed using the Friedman test. Correlations were examined using Spearman's correlation coefficient, and the influence of independent predictors on functional improvement was tested using linear regression analysis. A $p < 0.05$ was considered statistically significant.

RESULTS

A total of 57 patients with upper-limb MSDs were included, with 29 allocated to the control group and 28 to the experimental (KT) group. As shown in Table 1, the groups did not differ significantly in terms of sex, age distribution, education level, employment status, occupation, or use of assistive devices ($p > 0.05$ for all variables). Table 1 summarizes the general characteristics of both groups. To account for baseline differences in functional status, analyses focused on both absolute change and relative (%) improvement in UEFI scores rather than on final scores alone.

Almost all participants reported pain at baseline (96.6% in the control group and 100% in the experimental group), confirming comparable symptomatic status at therapy initiation.

Nearly all participants reported current pain on the day of assessment, confirming symptomatic presentation at therapy initiation (96.6% control vs. 100% experimental; $p = 0.322$). Overall, the two study groups were homogeneous regarding demographic and baseline clinical characteristics, ensuring that differences in outcomes could be attributed to therapeutic effects rather than to sample heterogeneity.

Functional ability of the upper limb was assessed using the UEFI at three time points: before therapy, mid-treatment, and after completion of therapy (Table 2). Results demonstrated statistically significant improvement across all domains in both groups (Friedman test, $p < 0.001$). Between-group comparisons indicated a more rapid and pronounced functional recovery in the experimental group, particularly during the early phases of rehabilitation.

At baseline, both groups exhibited moderate-to-severe functional limitation, with median total UEFI scores of 35.0 (IQR 25.0-47.0) in the control group and 24.0 (IQR 19.0-27.0) in the KT group (p=0.002). Significant intergroup differences were observed in several daily activities, especially those requiring shoulder elevation, endurance, and coordination, including lifting groceries to head level, driving, sleeping, and tying shoes. These findings indicate that, despite comparable demographic and clinical characteristics, the experimental group started treatment with poorer upper-limb function, making subsequent improvements clinically meaningful.

By the midpoint of therapy, both groups showed significant improvement in upper-limb function compared with baseline ($p < 0.001$). The median UEFI score increased to 40.0 (IQR 36.0-52.5) in the control group and to 35.5 (IQR 31.0-39.0) in the KT group, with a statistically significant between-group difference ($p = 0.033$). Despite lower absolute scores, the experimental group demonstrated a steeper recovery trajectory, reflecting faster functional improvement.

At this stage, between-group differences favored the KT group in activities related to mobility, endurance, and coordination, including recreational or sports activities, lifting objects to head level, sleeping, and household tasks such as vacuuming and laundry handling. Patients treated with KT reported earlier reduction in pain and stiffness, improved shoulder elevation, and greater ease during complex upper-limb movements, supporting its role in accelerating functional recovery during the active rehabilitation phase.

After completion of therapy, both groups showed further improvement and achieved near-normal upper-limb function in most assessed activities. Median total UEFI scores reached 47.5 (IQR 43.0-57.5) in the control group and 45.5 (IQR 39.0-55.0) in the KT group, with no statistically significant difference between groups ($p = 0.474$).

Although final functional outcomes were comparable, the experimental group demonstrated superior performance in selected high-demand tasks, particularly vacuuming and washing clothes, suggesting better endurance and stability during repetitive movements. When absolute change from baseline was considered, the total functional gain remained substantially greater in the KT group (21.5 vs. 12.5 points), indicating a more pronounced overall improvement despite poorer initial functional status.

Across the three measurements, statistically significant within-group improvement was observed in all parameters ($p < 0.001$). However, the trajectory of improvement differed: patients in the Kinesio group demonstrated faster and more pronounced recovery in the early phase, while by the end of treatment, both groups reached comparable levels of function. The analysis of relative improvement (%) across age categories showed that KT provided higher gains at all age levels (Figure 1): In participants ≤30 years, median improvement reached 91.5% (IQR 52.25-169.75%) compared to 26% in the control group ($p = 0.038$). In those aged 31-58 years, improvement was 95.5% versus 54% ($p = 0.005$). In older patients (>58 years), improvement remained higher in the Kinesio group (75% vs. 54%) but without statistical significance ($p = 0.086$). Within-group

TABLE 1. General characteristics of both groups

General characteristics	Control group		Exposed group		Chi-square	*p*-value
	n	%	n	%		
Sex						
Female	14	48.30	17	60.70	0.888	0.346
Male	15	51.70	11	39.30		
Age						
Up to 30 years	8	27.60	4	14.30	1.518	0.468
31-58 years	15	51.70	17	60.70		
59+years	6	20.70	7	25.00		
Use of assistive devices						
Yes	0	0.00	0	0.00		
No	29	100.00	28	100.00		
Employment status						
Unemployed	4	13.80	9	32.10	4.4	0.35
Retiree	5	17.20	5	17.90		
Student	0	0.00	1	3.60		
High-school student	2	6.90	1	3.60		
Employed	18	62.10	12	42.90		
Educational level						
Vocational secondary school	2	6.90	1	3.60	1.628	0.653
Secondary school diploma	19	65.50	20	71.40		
Higher vocational school	0	0.00	1	3.60		
College	0	0.00	0	0.00		
University degree	8	27.60	6	21.40		
Occupation						
Homemaker	1	3.40	3	10.70		
Engineer	1	3.40	1	3.60		
Administrative staff	6	20.70	7	25.00		
Teacher	3	10.30	0	0.00		
Athlete	0	0.00	1	3.60		
Commercial worker	3	10.30	5	17.90		
Student	2	6.90	1	3.60		
Driver	2	6.90	0	0.00		
Craftsman	9	31.00	5	17.90		
Health professional	2	6.90	5	17.90		
Have you experienced any type of pain today?						
Yes	28	96.60	28	100.00	0.983	0.322
No	1	3.40	0	0.00		

comparisons confirmed consistent improvement regardless of age ($p > 0.75$ control; $p > 0.92$ experimental), indicating that the intervention was effective across all subgroups.

A multiple linear regression model was constructed to identify predictors of functional improvement (dependent variable: change in UEFI score).

Multiple linear regression analysis identified KT as the strongest independent predictor of functional improvement ($\beta = 0.423$; $p = 0.002$) (Tables 3a and 3b). The overall model was statistically significant ($F = 7.608$; $p < 0.001$) and explained 36.9% of the variance in functional gain ($R^2 = 0.369$). Diagnosis type was also a significant predictor ($\beta = -0.254$; $p = 0.030$), whereas sex and duration of therapy were not independently associated with functional improvement.

DISCUSSION

This study evaluated the impact of KT as an adjunct to standard physiotherapy on upper-limb functional recovery in patients with MSDs. Functional capacity was assessed using the UEFI, a validated and reliable instrument widely applied in clinical and research settings for evaluating the impact of musculoskeletal conditions on daily upper-limb activities. The UEFI demonstrates strong psychometric properties, clinical utility, and responsiveness to functional changes (29,30).

At baseline, both groups showed limitations in upper-limb function, with significantly lower scores in the KT group (median 24.0, IQR 19.0-27.0) than in the control group (median 35.0, IQR 25.0-47.0; $p = 0.02$). Tasks that were impossible to perform in the KT group included lifting grocery bags to waist or head level, while all activities in the control group were at least partially achievable. The best-rated activities among controls were buttoning clothes and sleeping (median 3.0). These findings confirmed that the KT group started from a lower functional baseline, making their subsequent improvement clinically meaningful. During therapy, both groups showed progressive UEFI improvement, confirming the effectiveness of rehabilitation.

TABLE 2. Functional assessment of the upper extremity

Difficulties in performing	I testing			II testing			III testing		
	Control group	Exposed group	*p*-value	Control group	Exposed group	*p*-value	Control group	Exposed group	*p*-value
	Median (IQ range)	Median (IQ range)		Median (IQ range)	Median (IQ range)		Median (IQ range)	Median (IQ range)	
Any regular or usual work	2.0 (1.0-3.0)	1.0 (0.0-1.0)	0.002	2.0 (2.0-2.0)	2.0 (2.0-2.0)	0.395	2.0 (2-3)	2.0 (2-3)	0.446
Usual hobby (recreational or sports activities)	1.0 (1.0-2.0)	1.0 (0.0-2.0)	0.241	2.0 (1.0-3.0)	1.0 (1.0-2.0)	0.001	2.0 (2-3)	2.0 (1-3)	0.205
Lifting a bag of groceries to waist level	1.0 (0.0-2.0)	0.0 (0.0-1.0)	0.031	2.0 (1.0-2.0)	1.0 (1.0-2.0)	0.954	2.0 (1-2)	2.0 (2-3)	0.104
Lifting a bag of groceries to head level	1.0 (0.0-2.0)	0.0 (0.0-1.0)	0.001	1.0 (1.0-2.0)	0.5 (0.0-1.0)	0.012	1.0 (1-2)	1.0 (1-2)	0.339
Combing hair	2.0 (1.0-4.0)	1.0 (1.0-2.0)	0.050	3.0 (2.0-4.0)	2.0 (2.0-3.0)	0.024	3.0 (3-4)	3.0 (3-3)	0.296
Pushing with hands (e.g., pulling laundry from a tub or pushing an object from a chair)	1.0 (1.0-3.0)	1.0 (1.0-1.0)	0.010	2.0 (1.0-3.0)	1.5 (1.0-2.0)	0.109	2.0 (2-3)	2.0 (2-3)	0.377
Preparing food	2.0 (2.0-3.0)	2.0 (1.0-2.0)	0.002	2.0 (2.0-3.0)	2.0 (2.0-3.0)	0.195	3.0 (2-3)	3.0 (2-3)	0.955
Driving	2.0 (1.0-2.0)	1.0 (0.0-2.0)	<0.001	2.0 (2.0-3.0)	2.0 (1.0-2.0)	0.014	3.0 (2-3)	2.0 (2-3)	0.122
Vacuuming the apartment	2.0 (1.0-3.0)	1.0 (1.0-1.0)	0.025	2.0 (2.0-3.0)	1.0 (1.0-2.0)	0.001	2.0 (2-3)	2.0 (1-3)	0.029
Dressing	2.0 (2.0-3.0)	2.0 (2.0-2.0)	0.007	2.0 (2.0-3.0)	2.0 (2.0-3.0)	0.366	3.0 (3-3)	3.0 (3-3)	1.000
Buttoning clothes	3.0 (2.0-3.0)	2.0 (1.0-2.0)	0.059	3.0 (2.0-3.0)	3.0 (2.0-3.0)	0.870	3.0 (3-4)	4.0 (3-4)	0.141
Using tools and utensils	2.0 (1.0-3.0)	1.0 (1.0-2.0)	0.013	2.0 (1.0-3.0)	2.0 (1.0-2.0)	0.344	2.0 (1-3)	2.0 (1-3)	0.462
Opening doors	2.0 (2.0-3.0)	2.0 (2.0-2.0)	<0.001	3.0 (2.0-4.0)	3.0 (2.0-3.0)	0.567	3.0 (3-4)	3.0 (3-4)	0.455
Cleaning	2.0 (1.0-3.0)	1.0 (1.0-1.0)	0.008	2.0 (2.0-3.0)	2.0 (2.0-2.0)	0.143	3.0 (2-3)	2.0 (2-3)	0.246
Putting on and tying shoes	2.0 (2.0-3.0)	2.0 (1.0-2.0)	<0.001	3.0 (2.0-3.0)	2.0 (2.0-3.0)	0.412	3.0 (2-4)	3.0 (3-3)	0.681
Sleeping	3.0 (2.0-3.0)	1.0 (0.0-2.0)	<0.001	3.0 (2.0-3.0)	2.0 (1.0-3.0)	0.003	3.0 (3-3)	3.0 (2-3)	0.092
Washing clothes (washing, wringing, hanging)	2.0 (1.0-3.0)	1.0 (1.0-1.0)	0.073	2.0 (1.0-3.0)	2.0 (1.0-2.0)	0.046	3.0 (2-4)	2.0 (1-3)	0.005
Opening a jar	1.0 (0.0-2.0)	1.0 (0.0-1.0)	0.050	2.0 (1.0-2.0)	2.0 (1.0-2.0)	0.603	2.0 (1-3)	2.0 (2-3)	0.754
Throwing a ball	1.0 (0.0-3.0)	1.0 (0.0-1.0)	0.310	2.0 (1.0-3.0)	1.0 (1.0-2.0)	0.095	2.0 (1-3)	2.0 (1-2)	0.316
Carrying a small suitcase	1.0 (1.0-3.0)	1.0 (1.0-1.0)	0.001	1.0 (1.0-3.0)	1.0 (1.0-2.0)	0.941	2.0 (1-3)	2.0 (1-2)	0.571
Total	35.0 (25.0-47.0)	24.0 (19.0-27.0)	0.002	40.0 (36.0-52.5)	35.5 (31.0-39.0)	0.033	47.50 (43.0-57.5)	45.50 (39.0-55.0)	0.474

IQ: Interquartile

TABLE 3A. Summary of regression model and analysis of variance results

Model	R	R^2	Adjusted R^2	Standard error
1	**0.608**[a]	**0.369**	0.321	0.54170
Model	**Sum of squares**	**df**	**Mean square**	**F/*p*-value**
Regression	8.930	4	2.233	F=7.608, *P*<0.0001
Residual	15.259	52	0.293	
Total	24.189	56		

[a]Predictors: (Constant), duration of therapy (days), sex, diagnosis, group. Dependent variable: Improvement of upper-limb function
Overall model summary derived from a multiple linear regression analysis with improvement of upper-limb function as the dependent variable. Bold values indicate statistically significant results (p < 0.05)

TABLE 3B: REGRESSION COEFFICIENTS MATRIX

Model	B	Standard error	Beta	t	*p*-value
(Constant)	2.360	0.366	—	6.455	<0.001
Use of Kinesio Tape	**0.552**	**0.166**	**0.423**	**3.328**	**0.002**
Sex	−0.245	0.148	−0.188	−1.655	0.104
Diagnosis	**−0.075**	**0.034**	**−0.254**	**−2.232**	**0.030**
Duration of therapy (days)	−0.046	0.024	−0.240	−1.860	0.069

Bold values indicate statistically significant results (p < 0.05)

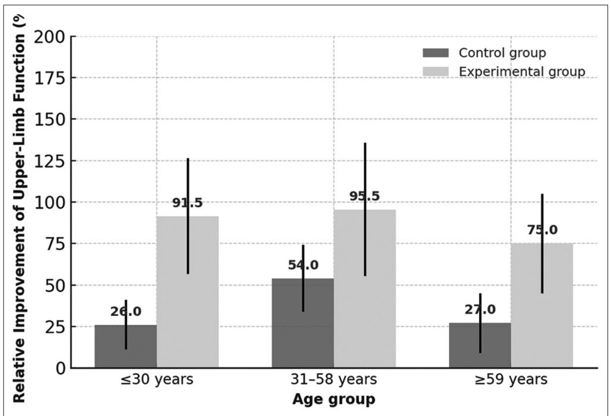

FIGURE 1. Relative upper limb improvement by age.

The control group reached a median score of 40.0 (36.0-52.5), and the KT group 35.5 (31.0-39.0), with a significant difference (p = 0.033). The functional gain compared with baseline was +5 points in the control group and +11.5 points in the KT group. After the KT application, no activity remained "impossible," suggesting faster pain reduction and earlier reactivation of upper-limb function.

At therapy completion, both groups achieved marked recovery: the control group had a median UEFI score of 47.5 (43.0-57.5) and the KT group 45.5 (39.0-55.0; p = 0.474). When baseline improvement was considered, KT-treated patients showed almost double the total functional gain (21.5 vs. 12.5 points). These results indicate that conventional physiotherapy led to gradual progress, while KT produced faster functional recovery, especially between the first and second assessments. These findings are in agreement with results from previous and recent studies. Durgut et al. in their study in 2024 (31) reported that KT significantly enhanced shoulder range of motion, grip strength, and overall function in patients with rotator cuff tendonitis compared with cold therapy. Similarly, Yang and Choi (32) found that KT combined with home-based upper-limb exercise training significantly improved both upper-limb function and self-efficacy in stroke patients. Chou et al. (33) also demonstrated that KT accelerated functional recovery of both proximal and distal upper-limb segments and improved performance in daily activities among individuals undergoing stroke rehabilitation. Collectively, these findings support the premise that KT facilitates more efficient neuromuscular activation, improved proprioception, and increased functional stability in the upper limb.

The relative functional improvement in this study further supports KT effectiveness. Participants treated with KT achieved a 90% improvement, compared with 36% in the control group, representing a 2.5-fold higher gain. Moreover, the functional improvement observed in the KT group by mid-therapy already exceeded the total end-of-treatment improvement seen in the control group by 12%. These results confirm that KT not only enhances total recovery but also significantly reduces the duration of rehabilitation, an important consideration for clinical efficiency and patient outcomes. Including group allocation in the regression model allowed adjustment for baseline functional differences and confirmed the independent contribution of KT to functional improvement.

Comparable results were observed in other investigations using the UEFI. Abbott and Schmitt (34) reported an average post-treatment UEFI score of 53 ± 19 in musculoskeletal patients, similar to the final functional scores obtained in this study. Hefford et al. (35) found an average improvement of 19.7 points in UEFI retests, nearly identical to the change observed in our KT group. In 2024, a study by Castelli et al. (36), KT was shown to significantly improve manual dexterity and coordination during upper-limb rehabilitation, emphasizing its benefit for fine motor control and task-specific function.

When improvement was analyzed by diagnosis, the greatest benefits of KT were observed in patients with periarthritis (median 2.79 [2.07-3.77]) and distension (2.17 [1.41-2.92]) compared to standard therapy alone (1.65 and 1.15, respectively). Functional gains were also noted in conditions such as fractures, dislocations, tendovaginitis, and post-arthroscopy recovery. These findings are consistent with the review by Ostelo et al. (37), which defined a 30% improvement as clinically meaningful and a 50% improvement as highly significant thresholds clearly exceeded in our KT-treated participants. Finally, a 2021 systematic review by Jaroń et al. (38) concluded that KT is increasingly utilized across multiple clinical fields, including orthopedics, neurology, and sports medicine, and can be considered a safe and effective adjunct or alternative to pharmacological treatment. Its mechanisms include enhanced circulation, edema reduction, proprioceptive facilitation, and stabilization of the affected joint structures, all of which contribute to faster and more effective rehabilitation outcomes. Overall, the present study demonstrates that KT is an efficient, non-invasive, and low-cost therapeutic addition that accelerates upper-limb functional recovery in patients with MSDs. The greatest advantage of KT lies in its ability to facilitate early improvement, enhance endurance and coordination, and shorten the overall rehabilitation period, making it a valuable complement to conventional physiotherapy.

Limitations

One important limitation of the study is related to the period during which it was conducted. During the implementation of the study, the World Health Organization declared a global pandemic caused by the COVID-19 virus, which inevitably limited patient availability and reduced the number of eligible participants. Nevertheless, each patient underwent three repeated measurements at baseline, during treatment, and after completion of therapy-allowing robust within-subject comparisons over time. Based on this longitudinal design, the ethics committee evaluated the sample size as representative and sufficient for drawing valid conclusions.

CONCLUSION

Both standard physiotherapy and physiotherapy with KT significantly improved upper-limb function in patients with MSDs. The addition of Kinesio Tape led to faster and more pronounced improvement, particularly during the early rehabilitation phase and in activities requiring endurance and coordination. Although final outcomes were similar, relative functional gains were higher in the Kinesio group. Regression analysis confirmed KT as the strongest independent predictor of improvement, supporting its use as an effective adjunct to conventional rehabilitation.

DECLARATION OF INTEREST

Authors declare no conflict of interests.

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