



RESEARCH REPORT

Immediate effect of Kinesio taping on shoulder muscle strength and range of motion in healthy individuals: A randomised trial



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KEYWORDS

Kinesio tape;
peak torque;
shoulder rotation
range of motion

Abstract *Background:* Taping is widely used in the field of rehabilitation as both a means of treatment and prevention of sports-related injuries. In recent years, the use of Kinesio tape has become increasingly popular; it can be applied to virtually any muscle or joint in the body. Kinesio tape and its strength-enhancing properties have been the focus of recent research based on the neuromuscular facilitator theory. There has been, however, inconclusive evidence to either support or refute this theory.

Objective: This study investigated the immediate effect of Kinesio taping (KT) on peak torque of shoulder external rotators muscle and shoulder external and internal range of motion (ROM) in healthy individuals.

Methods: This was a single-blinded, placebo-controlled, randomised trial. A total of 39 participants were randomly allocated into three groups. Two main variables were measured—peak torque of shoulder external rotation at two isokinetic speeds (60°/s and 180°/s) was measured with a Biodex isokinetic dynamometer, and shoulder rotation ROM was measured with a standard goniometer. Dependent variables were measured after the application of three different taping conditions—no taping (NT), KT, and placebo taping (PT)—on each participant with 3-day intervals.

Results: The mean peak torque at speeds of 60°/s and 180°/s demonstrated no significant difference among the three taping conditions. No significant difference in external rotation range of motion was detected among the three taping conditions. The PT condition led to a significantly smaller mean internal range of motion value than KT and PT ($p < 0.016$).

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Conclusion: Overall, KT did not cause significant difference in shoulder external rotation peak torque, and shoulder internal and external range of motion in healthy individuals.

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Introduction

For an elite athlete, a small improvement in athletic performance could mean the difference between a gold medal and a silver one. Sports activities that demand jumping, kicking, and throwing require peak muscle strength for outstanding performance. Peak torque is the capability of the neuromuscular system to create the highest muscular force output at any moment during a repetition. The shoulder region is highly involved in all racquet strokes, and it has been shown that shoulder internal, external, and diagonal peak torques contribute substantially to service ball velocity [1]. Thus, it is not surprising that the shoulder region has been a major focus of racquet-related performance and injury prevention/rehabilitation research. Adequate strength and range of motion (ROM) in the rotator cuff muscles, specifically the rotator cuff—the infraspinatus and teres minor—are essential in preventing overhead overuse injuries as they are vital in stabilising and movement throughout the extreme ROM experienced during racquet strokes—specifically the service motion [1,2].

Taping is widely used in the field of rehabilitation as both a means of treatment and prevention of sports-related injuries [1,3–5]. The essential function of most types of tape serves to enhance proprioception and, therefore, to reduce the occurrence of injuries [3–5]. The most commonly used tape applications are done with nonstretch tape. The rationale is to provide protection and support to a joint or a muscle [1,3–9]. In recent years, the use of Kinesio tape (KT) has become increasingly popular [2,10]. KT was designed to mimic the qualities of human skin. It has roughly the same thickness as the epidermis and can be stretched between 30% and 40% of its resting length longitudinally. Kase et al [11] have proposed several benefits, depending on the amount of stretch applied to the tape during application: (1) to provide a positional stimulus through the skin, (2) to align fascial tissues, (3) to create more space by lifting fascia and soft tissues above the area of pain/inflammation, (4) to provide sensory stimulation to assist or limit motion, and (5) to assist in the removal of oedema by directing exudates toward a lymph duct. KT is unique in several respects when compared to most commercial brands of tape. It is latex-free, and the adhesive is 100% acrylic and heat activated. The 100% cotton fibres allow for evaporation and quicker drying. This allows KT to be worn in the shower or pool without having to be reapplied. Lastly, prescribed wear time for one application is longer, usually 3–4 days.

KT can be applied to virtually any muscle or joint in the body. KT and its strength-enhancing properties have been the focus of recent research based on the neuromuscular facilitator theory. There has been, however, inconclusive evidence to either support or refute this theory. The application of KT could increase eccentric isokinetic peak torque in healthy normal females upon the application of tape on quadriceps muscle [12].

The rotator cuff muscles play a vital role in normal arthrokinematics and asymptomatic shoulder function. The overhead athlete requires the rotator cuff to maintain an adequate amount of glenohumeral joint congruency for asymptomatic function. The sufficient strength of the external rotators (infraspinatus and teres minor), in particular, is integral during the overhead throwing motion to develop an approximation force on the upper arm at the shoulder equal to body weight to prevent joint distraction. The balance between external and internal rotation strength is important to normal glenohumeral joint function, especially during athletic activities. An adequate external–internal rotator muscle strength ratio has been emphasised in the literature [13].

The addition of KT application to the exercise programme appears to be more effective than the exercise programme alone for the treatment of subacromial impingement syndrome [14]. A number of case studies have provided early evidence supporting KT use in a range of conditions and outcome measures such as pain-free ROM in those with myofascial shoulder pain [5]. The results of all these reports suggest that KT can be clinically beneficial, but the high risk of bias associated with case studies and their inability to demonstrate cause and effect limits the use of these results for informing clinical practice [15].

An investigation was conducted to determine the short-term clinical efficacy of Kinesio taping (KT) when applied to college students with shoulder pain, as compared to sham taping [6]. The results showed that the therapeutic KT group showed an immediate improvement in pain-free shoulder abduction after tape application. No other differences between groups regarding ROM, pain, or disability scores at any time interval were found [6]. Another study aimed to investigate the effect of elastic taping on kinematics, muscle activity, and strength of the scapular region in baseball players with shoulder impingement. The elastic taping resulted in positive changes in scapular motion and muscle performance. The results supported its use as a treatment aid in managing shoulder impingement problems [7]. However, an investigation into the immediate effect of KT on peak torque production and ROM is lacking in the literature. Therefore, the purpose of this study is to determine the immediate effect of KT on peak torque production of shoulder external rotators and shoulder internal and external rotation ROM through quantitative measurements.

Methods

Participants

All participants were enrolled from Jamia Hamdard (Hamdard University) campus, Hamdard Nagar, New Delhi, India. All included participants were allotted specific time to report at the Rehabilitation Centre, Jamia Hamdard.

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