



RANDOMISED PLACEBO CONTROLLED TRIAL

Does kinesiology tape increase trunk forward flexion?



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KEYWORDS

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Summary *Introduction:* Non specific lower back pain is a common musculoskeletal disorder in manual labourers due to the strenuous nature of their job. Fear of pain can cause restrictions in trunk movement leading to reduced flexibility. Kinesiology Tape (KT) may be an option for treating low back stiffness. The present study investigated the immediate effect of KT on trunk flexion active range of motion.

Method: 34 male participants (mean age \pm SD: 42 ± 11), in physically demanding jobs, asymptomatic of pain, with a history of non specific lower back pain were randomly assigned to: 1) KT Intervention (KTI) or 2) KT Placebo (KTP). Trunk flexion data was collected at baseline and immediately following tape application. ANCOVA was used to examine the differences between groups.

Results: The KTI group demonstrated a statistically significant gain in Trunk flexion compared with baseline (2.75 cm, $P < 0.05$). Changes from pre to post treatment for the KTP were not significant (1.57 cm, $P = 0.062$). No statistically significant differences existed between groups post-treatment ($P = 0.218$).

Conclusion: KTI demonstrates an immediate positive effect on trunk flexion when compared with baseline measurements. However, results suggest that KTI performs no better than a comparable placebo.

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The protocol for this study was approved by The University of Southampton Ethics and Research Governance Online.

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Introduction

Lumbar instability leads to lower back pain (LBP), which in turn reduces muscle strength, endurance, flexibility and range of motion (ROM) (Cho et al., 2015). Patients who experience Chronic LBP for longer than 6 months often restrict their trunk movement due to fear of increased pain, which leads to loss of function, paraspinal muscle and multifidus weakening (Cho et al., 2015; Ng et al., 2002). Manual labourers' have been recognised as high risk for LBP due to the nature of their work; strenuous activity, repetitive load and working in a trunk flexed position (Coenen et al., 2013; Heneweer et al., 2011; Hoy et al., 2010; Osborne et al., 2012).

It has been suggested that LBP leads to limited ROM through reluctance of the injured individual to move their trunk to the end of range due to fear of increased pain (Ng et al., 2002). Long term fear avoidance leads to a lack of use and reduced flexibility, increasing the risk of limited ROM and stiffness. In order to prevent financial strain on both the UK Health service and employers, it is crucial that an effective treatment modality is devised to address stiffness and restore ROM caused by LBP.

There are a number of treatment modalities recognised by the National Institute for Health and Care Excellence (NICE, 2009). However, these can be time consuming and costly, leading to prolonged symptoms and accumulating sick leave.

Kinesiology Tape (KT) may be an option for the treatment of stiffness caused by previous episodes of LBP. KT was developed in the 1970s by Japanese chiropractor, Kenzo Kase (Grześkowiak et al., 2014). It has the ability to be stretched in order to facilitate rather than restrict movement (Kase et al., 1996). The tape supposedly lifts the skin and increases the space between skin and muscle to enable increased blood flow and lymphatic fluid (Grześkowiak et al., 2014). KT is cheap, readily available and can easily be applied by a Therapist or family member to allegedly provide immediate relief of symptoms (González-Iglesias et al., 2009). KT is frequently used in the sporting environment, clinical practice and at home (Walker, 2014). However, there are very few quality studies (Williams et al., 2011; Joscha and Julian, 2010) and conflicting evidence regarding its effectiveness (Walker, 2014).

Kase proposed that KT reduces pain and normalises muscular function to increase joint ROM. The exact mechanism for increased ROM is not well understood, but there are a number of hypotheses: (1) an increase in blood circulation to the taped area, may enhance muscle function and facilitate increased ROM within the muscle (Cho et al., 2015; Yoshida and Kahanov, 2007), (2) sensory feedback and activation of the Pain Gate (González-Iglesias et al., 2009; Thelen et al., 2008), (3) lifting of the skin (via convolutions) to reduce pressure on subcutaneous nociceptors (Kahanov, 2007) in turn reducing pain perception and fear of movement (González-Iglesias et al., 2009).

Williams et al. (2011) performed a Meta-Analysis for the effectiveness of KT, reporting on ten papers (only one involving the lumbar spine). They concluded that KT may have a small beneficial effect on active ROM of an injured area but further clarification is required. Yoshida and

Kahanov (2007), Castro-Sánchez et al. (2012), Lemos et al. (2014) carried out randomised controlled trials, while Karatas et al. (2012) and Hwang-Bo and Lee (2011) published case reports. All five studies reported a significant increase in trunk flexion following the application of KT. Similarly recent randomised controlled trials involving shoulder pain (Thelen et al., 2008), whiplash (González-Iglesias et al., 2009) and Osteoarthritic knees (Cho et al., 2015) all reported significant improvements in ROM post KT application. However, the majority of the studies to date lack detail; with insufficient randomisation, no placebo control group, and the inclusion of "healthy individuals," under 30 years old with no "movement problems". Recent systematic reviews concluded no substantial evidence to support the use and treatment efficacy of KT (Bassett et al., 2010; Morris et al., 2013).

From the limited KT and trunk ROM literature to date it is apparent that it is lacking in both quality and detail. To date, no studies have conducted a randomised placebo controlled trial, on participants aged between 30 and 60 years, who are most likely to present with a previous history of LBP or 'movement dysfunction' (Jordan et al., 2010).

The aim of the present study was to investigate the immediate effect of KT on trunk flexion in Manual labourer's who present with a previous history of LBP. We hypothesise that there will be a difference in trunk forward flexion active ROM between participants who receive KT intervention compared to those who receive placebo taping.

Methods

Participants

Individuals working in physically demanding jobs were recruited through poster advertisements placed and circulated in local firms and gyms.

Individuals were eligible for inclusion in the study if they were 30–60 years old, worked in a manual job (a physical job, including; plumbing, building, farming, gardening/landscape design), were asymptomatic of LBP for the past 3 months but had a prior history of Non Specific LBP (defined as back pain localised between the lowest rib and gluteal creases with or without leg(s) pain and with no definitive cause (Chen et al. 2012). Duration of an episode more than 6 weeks or recurrent LBP lasting longer than 24 h with at least one month pain-free before and after the episode and multiple episodes in a year (AlBahel et al., 2013; Chen et al., 2012).

Volunteers were excluded if they had clinical signs of radiculopathy (paraesthesia, numbness, sensory changes, weakness or abnormal reflexes), major trauma, previous spinal surgery, pregnancy, allergy/intolerance to tape, corticosteroid treatment in the previous 2 weeks or clinical diagnosis of any of the following, lumbar stenosis, fibromyalgia, spondylolisthesis, systemic disease, cancer, osteoporosis, inflammatory disease and central or peripheral nervous disease (Added et al., 2013; Castro-Sánchez et al., 2012; Chen et al., 2012; Paoloni et al., 2011; Parreira et al., 2014).

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