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# Kinesio taping for low back pain and work productivity: A randomized controlled trial

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**Abstract:**
Non-specific low back pain (NSLBP) is a common occupational burden among sedentary IT professionals, impairing function and productivity. Therefore, it is of interest to evaluate the Kinesio Taping (KT) for pain, postural control, lumbar range of motion, disability and work productivity. Participants at two IT campuses in Bengaluru, India, received either KT with ergonomic advice or ergonomic advice alone. KT with ergonomic advice produced significantly greater gains in pain, postural control and productivity, with only minor transient skin reactions. Thus, data shows that Kinesio Taping is a feasible adjunct physiotherapy intervention for chronic low back pain in sedentary IT workers.

**Keywords:** Kinesio taping (KT), low back pain (LBP), postural control, work productivity, it professionals, sedentary occupation, randomized controlled trial (RCT), occupational physiotherapy

**Background:**
Low back pain (LBP) ranks as the leading cause of years lived with disability worldwide, affecting an estimated 619 million individuals and imposing substantial economic costs through lost productivity and healthcare expenditure **[1]**. Non-specific low back pain (NSLBP), defined as pain in the lumbar region without an identifiable pathological cause, accounts for 85–90% of all LBP presentations and continues to be a major contributor to occupational morbidity **[2]**. Prevention and conservative management are central pillars of effective musculoskeletal care. The information technology (IT) sector, characterised by prolonged static sitting, excessive computer use and psycho-social occupational stress, has emerged as a high-risk workforce, with up to 67% of IT professionals reporting LBP at any given time and 40% experiencing chronic symptoms that interfere with occupational performance **[3]**. Sedentary occupational behaviour adversely affects lumbar disc nutrition, paraspinal muscle endurance and lumbopelvic postural control, creating a self-perpetuating cycle of pain and functional impairment **[4]**. Similarly, postural control, the ability to maintain equilibrium in static and dynamic conditions, is frequently compromised in individuals with NSLBP due to altered proprioception and disrupted motor control strategies **[5, 6]**. Kinesio Taping (KT), developed by Dr. Kenzo Kase in the 1970s, is an elastic, water-resistant therapeutic tape applied along muscles and fascia. Its proposed mechanisms include pain modulation via cutaneous mechanoreceptor stimulation, improved proprioception, enhanced lymphatic and circulatory flow and facilitation or inhibition of target muscles **[7]**. In low- and middle-income countries (LMICs) such as India, where access to prolonged physiotherapy may be limited, adjunct interventions that are simple, affordable and workplace-compatible carry particular relevance **[8]**. Their close fit with day-to-day occupational routines positions sedentary IT workers as a priority population with unmet needs for feasible musculoskeletal interventions. Despite this potential, the efficacy of Kinesio Taping in sedentary IT professionals with NSLBP remains barely explored in the Indian subcontinent. The few available studies suggest modest-to-moderate short-term pain reductions, but methodological heterogeneity, lack of sham-controlled designs and the near-universal exclusion of occupational-specific cohorts significantly limit the generalizability of existing evidence **[9]**. Therefore, it is of interest to report on a randomized controlled trial conducted at two IT campuses in Bengaluru, to address these gaps and inform targeted occupational physiotherapy interventions.

**Methodology:**
This randomized controlled trial was conducted at two large IT campuses in Bengaluru, Karnataka, India, both providing on-site occupational health services. Data was collected over the period of February 2025 – March 2026. The aim of the study was to focus on sedentary IT professionals, primarily software developers, analysts and desk-based support staff, aged 25–45 years, attending workplace health screening camps or the on-site occupational health clinic. Inclusion criteria were: (i) age 25–45 years, (ii) full-time sedentary desk-based employment (≥35 hours/week) for a minimum of two years, (iii) non-specific low back pain of ≥3 months duration with a Visual Analogue Scale (VAS) score ≥3/10 at rest and (iv) willingness to provide written informed consent and adhere to the four-week protocol. Exclusion criteria included: (i) specific spinal pathology (disc herniation with neurological deficit, spinal stenosis, spondylolisthesis, fracture, tumour, or infection), (ii) prior lumbar surgery, skin hypersensitivity to adhesive tape, current anticoagulant use, BMI >35 kg/m², or pregnancy, (iii) concurrent physiotherapy or corticosteroid injection within the preceding three months and (iv) inability to comply with outcome assessments. A total of 90 IT professionals were recruited and randomized in a 1:1 ratio over the study period. Participants were approached during workplace health screening camps or by occupational health referrals. Allocation was concealed using sequentially numbered, opaque, sealed envelopes (SNOSE), with stratification by sex and pain duration. A structured, validated protocol was designed based on existing studies conducted by physiotherapists and occupational health professionals. The protocol covered the following domains: (i) socio-demographic and anthropometric characteristics (age, gender, BMI, work experience, daily sitting hours), (ii) clinical baseline (pain duration, VAS, ODI), (iii) intervention delivery (lumbar Kinesio Taping protocol vs. standardized ergonomic advice), (iv) outcome assessment (pain intensity, functional disability, postural control, work productivity, lumbar range of motion) and (v) safety monitoring (skin reactions, pruritus and other adverse events). Written consent was obtained and all assessments were administered by a senior physiotherapist blinded to group allocation, with responses recorded in accordance with confidentiality and anonymity. Descriptive

statistics were used to summarize baseline characteristics and outcome responses. Continuous variables were presented as mean ± standard deviation and categorical variables as frequencies and percentages. Between-group differences were assessed using mixed-model repeated-measures ANCOVA, with baseline score as the covariate and independent-samples t-tests or chi-square tests, as appropriate. A p-value of <0.05 was considered statistically significant. Data analysis was done in SPSS version 27. Ethical considerations were addressed, as the study protocol was reviewed and approved by the Institutional Ethics Committee (IEC) of Janardan Rai Nagar Rajasthan Vidyapeeth Deemed To-Be-University, Udaipur, Rajasthan, India. Participants were informed about the study objectives, the voluntary nature of participation, their right to withdraw at any stage without consequence and the measures adopted to ensure confidentiality. Written informed consent was obtained from each participant before proceeding and participant anonymity was maintained throughout. Participation was entirely voluntary, with no financial incentives offered. Participants assigned to the control group were offered the Kinesio Taping intervention at the end of the trial, in line with the study's commitment to participant welfare.

**Results:**

A total of 90 sedentary IT professionals participated in the study. Their baseline socio-demographic and clinical characteristics are summarised in **Table 1.** The sample was predominantly male, with 50 male participants (56%) compared to 40 female participants (44%). The age distribution revealed that the largest proportion of participants were aged 30–39 years (n=42, 47%), suggesting that NSLBP in sedentary IT settings tends to cluster in mid-career professionals. This was followed by those in the 25–29 year age group (n=27, 30%) and the 40–45 year group (n=21, 23%). In terms of body mass index, the majority of participants were in the overweight range of 25–29.9 kg/m² (n=46, 51%), followed by those in the normal range of 18.5–24.9 kg/m² (n=33, 37%). A smaller proportion were in the obese class I range of 30–34.9 kg/m² (n=11, 12%). This relatively high overweight profile may reflect the prolonged sedentary nature of desk-based IT work. Notably, the vast majority of participants reported daily sitting time of more than 8 hours (n=72, 80%), with the remaining 18 participants (20%) reporting 6–8 hours daily. With respect to the duration of low back pain, participants with pain of 6–12 months formed the largest group (n=39, 43%). Those with pain of more than 12 months accounted for 36% (n=32) of the sample, while participants with pain of 3–6 months represented 21% (n=19). Taken together, nearly 80% of the sample had been experiencing low back pain for six months or longer, reflecting the chronic and often unaddressed nature of NSLBP in IT occupational settings. The duration of IT work experience varied across the sample. While 24% of participants (n=22) had less than five years of work experience, a substantial proportion had 5–10 years (n=44, 49%) or more than 10 years (n=24, 27%). Regarding ergonomic awareness at baseline, the majority of participants reported never having received formal ergonomic training (n=68, 76%). Current users of lumbar support accounted for 14% of the sample (n=13), while 10% (n=9) reported intermittent use. Gender-stratified analysis revealed no statistically significant difference in baseline VAS or ODI scores between male and female participants (p>0.05). Primary and secondary outcome data are summarized in **Table 2**. Approximately 98% of participants (n=44 in KT group) completed the full four-week protocol. At baseline, mean VAS scores were comparable between groups (KT: 6.2 ± 1.4; Control: 6.0 ± 1.5), with similar baseline ODI values (KT: 38.4 ± 8.6%; Control: 37.9 ± 9.1%). After four weeks, the KT group demonstrated a mean VAS reduction of 3.4 points (6.2 to 2.8) compared with 1.4 points in the control group (6.0 to 4.6), with an adjusted between-group difference of −1.8 points (95% CI: −2.3 to −1.3; p<0.001) and a large effect size (Cohen's d = 1.42), exceeding the established minimum clinically important difference of 1.5 cm in the KT group only. Regarding functional disability, the KT group achieved a 20.2 percentage point reduction in ODI scores (38.4% to 18.2%), compared with 10.6 points in the control group (37.9% to 27.3%). Postural control, measured by the Berg Balance Scale (BBS), improved from 42.1 to 50.6 in the KT group compared with 41.8 to 46.2 in controls (between-group difference +4.4 points; p<0.001), with the KT group achieving a clinically meaningful change. Work productivity, measured using the WPAI questionnaire, improved from 64.2% to 82.4% in the KT group versus 63.8% to 72.1% in the control group, representing an adjusted between-group difference of +10.3 percentage points (p<0.001). Higher baseline ergonomic adherence was significantly associated with better post-intervention work productivity scores in both subgroups (p<0.001). Adverse events and safety data are presented in **Table 3**. While 98% of KT participants completed all 12 taping sessions, mild and transient skin reactions occurred in a small proportion of the cohort. Skin irritation was reported in 4 participants (8.9%) and pruritus in 3 participants (6.7%), all in the KT group. Two participants in the KT group and one in the control group reported a transient increase in pain at the initial session, which resolved without intervention. Only 13% of participants reported any tape-related discomfort during the intervention period. The most commonly reported barriers to sustained workplace ergonomic adherence in the broader sample were lack of structured break time (71%), prolonged meeting schedules (49%), insufficient employer-provided ergonomic equipment (38%), workplace cultural norms discouraging breaks (19%) and personal time constraints (12%). Only one participant (2%) reported limited access to occupational physiotherapy services. Five percent reported all barriers simultaneously, underscoring the multifactorial nature of occupational LBP in IT settings.

**Table 1:** Baseline socio-demographic and clinical characteristics of participants (n=90)

| Category | Sub-Category | n (%) |
|---|---|---|
| **Age Group (Years)** | 25–29 | 27 (30) |
| | 30–39 | 42 (47) |
| | 40–45 | 21 (23) |
| **Gender** | Male | 50 (56) |
| | Female | 40 (44) |
| **Body Mass Index (kg/m²)** | Normal (18.5–24.9) | 33 (37) |

| | | |
|---|---|---|
| | Overweight (25–29.9) | 46 (51) |
| | Obese Class I (30–34.9) | 11 (12) |
| **Daily Sitting Hours** | 6–8 hours | 18 (20) |
| | >8 hours | 72 (80) |
| **Duration of Low Back Pain** | 3–6 Months | 19 (21) |
| | 6–12 Months | 39 (43) |
| | >12 Months | 32 (36) |
| **IT Work Experience** | <5 Years | 22 (24) |
| | 5–10 Years | 44 (49) |
| | >10 Years | 24 (27) |
| **Lumbar Support Use** | Current User | 13 (14) |
| | Intermittent User | 9 (10) |
| | Never Used | 68 (76) |

**Table 2:** Between-group comparison of primary and secondary outcomes at 4 weeks (n=90)

| Outcome Measure | KT Pre | KT Post | Control Pre | Control Post | p-value |
|---|---|---|---|---|---|
| **VAS Pain Score (0–10)** | 6.2 ± 1.4 | 2.8 ± 1.1 | 6.0 ± 1.5 | 4.6 ± 1.3 | <0.001 |
| **Oswestry Disability Index (%)** | 38.4 ± 8.6 | 18.2 ± 6.4 | 37.9 ± 9.1 | 27.3 ± 7.8 | <0.001 |
| **Berg Balance Scale (0–56)** | 42.1 ± 5.3 | 50.6 ± 3.8 | 41.8 ± 5.7 | 46.2 ± 4.5 | <0.001 |
| **Work Productivity (WPAI %)** | 64.2 ± 11.3 | 82.4 ± 8.6 | 63.8 ± 10.9 | 72.1 ± 9.8 | <0.001 |
| **Lumbar Flexion ROM (°C)** | 48.3 ± 8.2 | 62.4 ± 7.1 | 47.9 ± 8.6 | 54.6 ± 8.0 | <0.001 |
| **Lumbar Extension ROM (°C)** | 18.4 ± 4.6 | 24.1 ± 3.9 | 18.1 ± 4.8 | 20.8 ± 4.3 | <0.001 |

**Table 3:** Adverse events and barriers to ergonomic adherence (n=90)

| Event / Parameter | KT Group n (%) | Control Group n (%) |
|---|---|---|
| **Skin irritation / rash** | 4 (8.9) | 0 (0) |
| **Pruritus (itching)** | 3 (6.7) | 0 (0) |
| **Transient pain increase after application** | 2 (4.4) | 1 (2.2) |
| **Tape-related dropout** | 1 (2.2) | 0 (0) |
| **Serious adverse events** | 0 (0) | 0 (0) |
| **Common Barriers to Ergonomic Adherence** | **n (%)** | **–** |
| **Lack of Structured Break Time** | 64 (71) | 26 (29) |
| **Prolonged Meeting Schedules** | 44 (49) | 46 (51) |
| **Insufficient Ergonomic Equipment** | 34 (38) | 56 (62) |
| **Workplace Cultural Norms** | 17 (19) | 73 (81) |
| **Personal Time Constraints** | 11 (12) | 79 (88) |
| **Limited Access to Physiotherapy** | 2 (2) | 88 (98) |
| **All Barriers Combined** | 5 (5) | 85 (95) |

## Discussion:

The results from this study show that sedentary IT professionals with non-specific chronic low back pain experience clinically meaningful improvements in pain, postural control and work productivity following the addition of Kinesio Taping to standardised ergonomic advice. This is consistent with findings from several other studies that have explored the efficacy of taping interventions and conservative care in occupational and chronic LBP cohorts. For example, in a study by Lim and Tay (2015) **[10]** it was found that Kinesio Taping produced significant short-term reductions in pain intensity in chronic LBP patients, but the population was not occupationally specific. Similarly, Shanb *et al.* (2017) **[11]** observed that Kinesio Taping combined with exercise produced significantly greater reductions in pain and disability than exercise alone, although work productivity was not examined. This pattern aligns with the present study, where the KT group achieved a VAS reduction of 3.4 points and an ODI reduction of 20.2 percentage points, both exceeding the established minimum clinically important difference. Moreover, Kamel *et al.* **[12]** highlighted in their research that, while Kinesio Taping showed benefits for pain and lumbar mobility, methodological heterogeneity and the absence of sham-controlled designs limit firm conclusions. This is echoed in the present study, where lumbar flexion ROM improved by 14.1°C and extension by 5.7°C in the KT group, but the absence of a sham-taping arm constrains the attribution of effects purely to the active mechanisms of KT. These limitations underscore the need for rigorous, occupation-specific trials to confirm the magnitude of benefit. Chen *et al.* (2025) **[13]** reported that despite high awareness of ergonomic principles, sedentary workers were less likely to engage in sustained ergonomic practices due to various workplace barriers, including lack of structured break time and prolonged meeting schedules. In our study, only 24% of participants reported having received any prior ergonomic training and 71% identified lack of structured breaks as a major barrier. This highlights the importance of incorporating IT professionals into occupational health programmes not only as recipients of advice but also as active participants in workplace musculoskeletal prevention. Furthermore, the study by Molassiotis and Wang (2022) **[14]** on health behaviour change in occupational cohorts emphasised the importance of structured, workplace-delivered interventions for sustained adherence. Their research suggested that workers who received targeted, hands-on interventions were more likely to maintain improved health behaviours over time. This aligns with our findings, which suggest that participants who received Kinesio Taping in addition to ergonomic advice achieved a 10.3 percentage point greater improvement in work productivity than those receiving ergonomic advice alone, highlighting the potential benefits of integrating physical therapy adjuncts into routine occupational health programmes.

## Conclusion:

Sedentary IT professionals with chronic non-specific low back pain showed meaningful improvements in pain, disability, postural control, lumbar ROM and work productivity after Kinesio Taping with ergonomic advice. Workplace-integrated Kinesio Taping may enhance self-management, functional capacity and productivity while reducing presenteeism. Integrating Kinesio Taping into occupational physiotherapy may support early conservative management of occupational low back pain.

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