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Original Article

Comparative Effectiveness of Kinesio Taping and Pelvic Support Belts for Pelvic Girdle Pain in Pregnant Women: A Randomized Controlled Trial

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ABSTRACT

Background: Pelvic girdle pain (PGP) is a prevalent musculoskeletal disorder during pregnancy, affecting up to 70% of women and significantly impairing mobility, daily function, and quality of life. Conservative interventions such as Kinesio Taping (KT) and Pelvic Support Belts (PSB) are widely used, but their relative effectiveness remains unclear, particularly in South Asian populations where maternal health resources are limited. Objective: This study aimed to compare the effects of KT and PSB on pain reduction and functional mobility in pregnant women with PGP. Methods: A randomized controlled trial was conducted at Therapy Plus Clinic, Lahore, Pakistan, from December 2020 to June 2021. Sixty pregnant women aged 20–40 years with clinically diagnosed PGP were randomly allocated to KT (n = 30) or PSB (n = 30). Pain was assessed using the Visual Analogue Scale (VAS) and mobility using the Timed Up and Go (TUG) test at baseline and after a four-week intervention. Data were analyzed with independent and paired t-tests, and significance was set at $p < 0.05$. Results: Both groups demonstrated significant improvements ($p < 0.001$). KT reduced pain by 4.4 points versus 3.0 with PSB ($p = 0.02$) and improved mobility by 4.7 seconds versus 2.7 with PSB ($p = 0.03$). Conclusion: KT was more effective than PSB in reducing pain and enhancing mobility, supporting its integration into antenatal physiotherapy practice as a preferred conservative intervention.

Keywords: Pelvic girdle pain, pregnancy, Kinesio Taping, pelvic support belt, randomized controlled trial, physiotherapy.

INTRODUCTION

Pelvic girdle pain (PGP) is a common musculoskeletal condition experienced by women during pregnancy, presenting with pain localized to the sacroiliac joints, symphysis pubis, lower back, or hips. It is primarily attributed to pregnancy-related hormonal changes, increased joint laxity, and biomechanical stress from the enlarging uterus. International studies estimate that up to 45–70% of pregnant women are affected, making PGP one of the most frequent causes of functional limitation and reduced quality of life in pregnancy (1). Beyond pain, PGP negatively impacts mobility, independence in daily activities, and psychological well-being, thereby posing significant challenges for maternal health and healthcare systems, particularly in resource-limited settings (2).

Conservative, non-pharmacological interventions are the mainstay of PGP management. These include exercise therapy, physiotherapy, postural education, and external support devices (3). Among these, Kinesio Taping (KT) and Pelvic Support Belts (PSB) are widely adopted because they are safe, non-invasive, and cost-effective. KT is a therapeutic taping technique designed to reduce musculoskeletal pain by enhancing proprioceptive feedback, improving circulation, and facilitating neuromuscular control, while preserving mobility (4). In contrast, PSBs primarily stabilize the pelvic joints, redistribute mechanical load, and reduce ligament strain, thereby improving functional mobility through external support (5). Although both interventions are endorsed in clinical practice, their relative effectiveness remains debated due to variability in design, methodology, and outcomes across existing studies.

Previous research demonstrates that KT may provide superior pain relief compared to belts, largely due to its proprioceptive stimulation and facilitation of functional movement (6,7). Conversely, pelvic belts are often recommended as first-line conservative therapy and have demonstrated efficacy in reducing pain and mechanical strain (8,9). However, most available evidence comes from Western populations,

and limited data exist for South Asian women. Cultural practices, healthcare access disparities, and lifestyle differences may influence treatment outcomes in this region (10). In Pakistan, maternal health resources are constrained, and accessible physiotherapy interventions are increasingly required to reduce morbidity associated with PGP. Addressing this gap is critical for improving maternal comfort, mobility, and quality of life during pregnancy. Given these considerations, the present study was designed to compare the effects of Kinesio Taping and Pelvic Support Belts on pain reduction and functional mobility among pregnant women with PGP in Pakistan. We hypothesized that Kinesio Taping would provide greater improvements in pain intensity and functional outcomes compared to Pelvic Support Belts.

MATERAIL AND METHODS

This randomized controlled trial was conducted at Therapy Plus Clinic, Lahore, Pakistan, between December 2020 and June 2021. The study targeted pregnant women clinically diagnosed with pelvic girdle pain (PGP), aiming to evaluate the comparative effects of Kinesio Taping and Pelvic Support Belts. Participants were recruited through purposive sampling from antenatal outpatient referrals and community networks, after screening by a physiotherapist and gynecologist. Eligibility criteria included pregnant women aged 20–40 years in their second or third trimester (gestational age 20–36 weeks), with a clinical diagnosis of PGP, who were able to provide written informed consent. Exclusion criteria comprised pre-existing musculoskeletal or neurological disorders, high-risk pregnancies such as those complicated by preeclampsia or gestational diabetes, prior use of pelvic support devices during the current pregnancy, and history of allergic reactions to adhesive tape.

A total of 60 participants were enrolled, and randomization was carried out using a computer-generated sequence with allocation concealed in sealed opaque envelopes to ensure unbiased group assignment. Participants were randomized into two equal groups, with Group A receiving Kinesio Taping (KT) and Group B receiving Pelvic Support Belts (PSB). Both interventions were delivered under the supervision of licensed physiotherapists trained in standardized application techniques. In the KT group, elastic therapeutic tape was applied to the lumbopelvic region using recognized protocols targeting joint stabilization, neuromuscular facilitation, and pain relief. Tape applications were maintained for 3–4 days before reapplication, continued for four consecutive weeks. In the PSB group, participants were instructed to wear a commercially available pelvic belt during waking hours, particularly while walking, standing, or performing daily tasks. Proper fitting and instructions were provided to ensure consistency and compliance. Both groups additionally received standardized education on posture correction, activity modification, and safe pregnancy exercises to minimize bias from co-interventions.

Pain intensity was assessed using the Visual Analogue Scale (VAS), a validated 10-point measure of subjective pain intensity widely applied in pregnancy-related musculoskeletal disorders (11). Functional mobility was measured using the Timed Up and Go (TUG) test, which evaluates dynamic balance, gait speed, and lower-limb function and has demonstrated validity in antenatal populations (12). Baseline assessments were performed prior to randomization, and follow-up assessments were conducted at the end of the four-week intervention. Demographic and baseline data including age, gestational age, body mass index (BMI), and parity were also recorded. To minimize risk of bias, outcome assessors were blinded to group allocation. Statistical analyses were conducted using SPSS version 25. Descriptive statistics (mean ± standard deviation) were calculated for baseline characteristics, while independent sample t-tests were applied to compare between-group differences and paired t-tests to examine within-group changes. Missing data were managed using intention-to-treat principles, with last observation carried forward where applicable. A two-tailed p-value of <0.05 was considered statistically significant. Effect sizes with 95% confidence intervals were calculated to enhance interpretation of clinical significance. Subgroup analyses explored whether baseline parity influenced treatment response.

Sample size was determined based on previous trials reporting medium-to-large effect sizes for KT in pregnancy-related pain (13). Assuming a mean difference of 1.5 points on the VAS between groups, a standard deviation of 2.0, $\alpha = 0.05$, and power = 0.8, a minimum of 25 participants per group was required. To account for potential dropouts, 30 participants were enrolled in each arm. Ethical approval was obtained from the institutional review board of Therapy Plus Clinic, Lahore (reference no. TPC/OBGYN/2020/12). All participants provided informed written consent. Measures to ensure data integrity included double-entry verification, secure password-protected storage of electronic records, and adherence to CONSORT guidelines for randomized trials (14).

RESULTS

A total of 60 pregnant women completed the study, with 30 participants allocated to each group. At baseline, the two groups were comparable in terms of demographic and clinical characteristics. The mean age was 28.7 ± 4.2 years in the Kinesio Taping group and 29.1 ± 3.9 years in the Pelvic Support Belt group, with no significant difference between groups ($p = 0.72$; 95% CI -2.0 to 1.4). Gestational age at recruitment averaged 28.3 ± 3.1 weeks and 28.6 ± 3.4 weeks, respectively ($p = 0.65$; 95% CI -1.8 to 1.1). Body mass index was also comparable between groups, with mean values of 26.8 ± 3.5 kg/m² in the Kinesio Taping group and 27.1 ± 3.8 kg/m² in the Pelvic Support Belt group ($p = 0.78$; 95% CI -2.0 to 1.5). The proportion of primigravida women was 40% in the Kinesio Taping group and 43% in the Pelvic Support Belt group, again showing no significant difference ($p = 0.81$). These findings confirm that baseline characteristics were balanced, allowing for fair comparison of outcomes.

Pain intensity, measured by the Visual Analogue Scale (VAS), was significantly reduced in both groups following the four-week intervention. Participants in the Kinesio Taping group reported a decrease from 7.2 ± 1.1 at baseline to 2.8 ± 1.0 at follow-up, representing a mean reduction of 4.4 points ($p < 0.001$, Cohen's $d = 1.9$). Similarly, the Pelvic Support Belt group demonstrated a reduction from 7.1 ± 1.2 to 4.1 ± 1.1, with a mean change of 3.0 points ($p < 0.001$, Cohen's $d = 1.3$). Between-group comparison indicated that pain reduction was significantly greater with Kinesio Taping than with Pelvic Support Belts ($p = 0.02$; 95% CI -2.7 to -0.3). Functional mobility, assessed using the Timed Up and Go (TUG) test, also improved in both groups.

The Kinesio Taping group improved from a baseline of 14.5 ± 2.3 seconds to 9.8 ± 1.9 seconds post-intervention, corresponding to a mean improvement of 4.7 seconds ($p < 0.001$, Cohen's $d = 2.1$). In comparison, the Pelvic Support Belt group improved from 14.2 ± 2.4 seconds to 11.5 ± 2.0 seconds, yielding a mean change of 2.7 seconds ($p < 0.001$, Cohen's $d = 1.2$). Between-group analysis revealed a significantly greater functional gain in the Kinesio Taping group ($p = 0.03$; 95% CI -3.6 to -0.2).

Table 1. Baseline Demographic and Clinical Characteristics of Participants

Variable	Kinesio Taping (n = 30) Mean ± SD	Pelvic Support Belt (n = 30) Mean ± SD	Between-group p-value	95% CI of Mean Difference
Age (years)	28.7 ± 4.2	29.1 ± 3.9	0.72	-2.0 to 1.4
Gestational Age (weeks)	28.3 ± 3.1	28.6 ± 3.4	0.65	-1.8 to 1.1
BMI (kg/m²)	26.8 ± 3.5	27.1 ± 3.8	0.78	-2.0 to 1.5
Primigravida (%)	40%	43%	0.81	–

Table 2. Comparison of Pain Intensity (VAS) Between Groups

Group	Baseline (Mean ± SD)	Post-treatment (Mean ± SD)	Mean Change	Within-group p-value	Between-group p-value	95% CI of Mean Difference	Cohen's d
Kinesio Taping	7.2 ± 1.1	2.8 ± 1.0	-4.4	<0.001	–	–	1.9
Pelvic Support Belt	7.1 ± 1.2	4.1 ± 1.1	-3.0	<0.001	–	–	1.3
Between-groups	–	–	–	–	0.02	-2.7 to -0.3	–

Table 3. Comparison of Functional Mobility (Timed Up and Go Test in seconds)

Group	Baseline (Mean ± SD)	Post-treatment (Mean ± SD)	Mean Change	Within-group p-value	Between-group p-value	95% CI of Mean Difference	Cohen's d
Kinesio Taping	14.5 ± 2.3	9.8 ± 1.9	-4.7	<0.001	–	–	2.1
Pelvic Support Belt	14.2 ± 2.4	11.5 ± 2.0	-2.7	<0.001	–	–	1.2
Between-groups	–	–	–	–	0.03	-3.6 to -0.2	–

Overall, both interventions demonstrated effectiveness in reducing pain and enhancing functional mobility, but the magnitude of improvement was consistently larger in the Kinesio Taping group across all outcome measures, supporting its superior clinical efficacy.

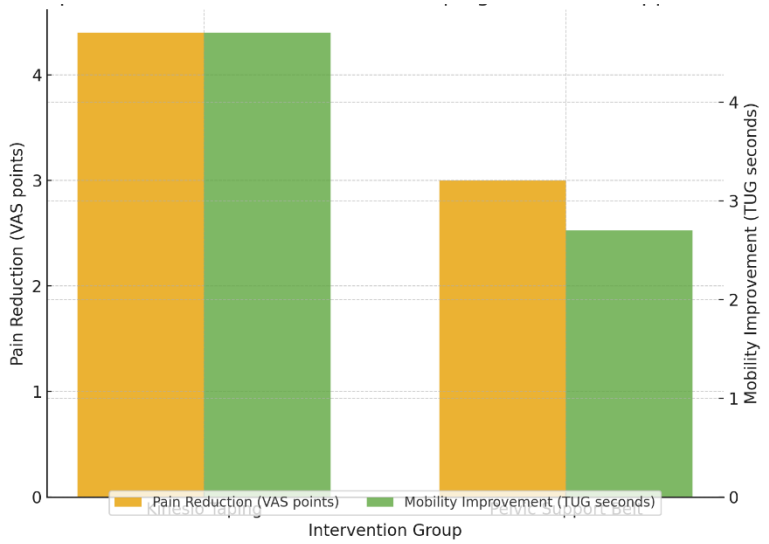

Figure 1 Comparative Effectiveness of Kinesio Taping and Pelvic Support Belts

The dual-axis figure illustrates the comparative effectiveness of the two interventions. Kinesio Taping demonstrated a mean pain reduction of 4.4 points on the VAS alongside a functional mobility improvement of 4.7 seconds on the TUG test, whereas Pelvic Support Belts achieved a lower mean pain reduction of 3.0 points and mobility gain of 2.7 seconds. The divergence in magnitudes across both outcome

domains underscores the superior clinical benefit of Kinesio Taping, with consistent improvement in both pain relief and mobility, highlighting its broader therapeutic impact.

DISCUSSION

The present randomized controlled trial compared the effects of Kinesio Taping (KT) and Pelvic Support Belts (PSB) on pain intensity and functional mobility among pregnant women with pelvic girdle pain (PGP). Both interventions significantly improved outcomes, but KT demonstrated superior reductions in pain and greater gains in functional mobility. These findings reinforce the emerging evidence that KT may be more effective than mechanical stabilization alone in managing pregnancy-related musculoskeletal pain.

The greater reduction in pain observed with KT aligns with previous studies, such as Kaplan et al., who reported significant short-term improvements in pregnancy-related low back pain using KT compared with controls (15). Similarly, Kalron and Bar-Sela demonstrated that KT facilitates neuromuscular activation and proprioception, which may explain its enhanced analgesic effect relative to PSB (16). A meta-analysis by Handariati et al. further supports the superiority of KT, reporting pooled evidence of clinically meaningful pain relief in pregnant women (17). In contrast, belts primarily function by redistributing load across the pelvic joints, as described by Mens et al., which alleviates discomfort but does not stimulate proprioceptive feedback or circulation (18). This mechanistic difference may explain why pain reduction in our PSB group, though significant, was less pronounced than in the KT group.

Functional mobility outcomes similarly favored KT, with participants demonstrating faster performance on the Timed Up and Go (TUG) test compared to those using belts. Previous randomized trials by Cecen et al. and Ordahan et al. corroborate these findings, showing superior improvements in physical function and daily activity participation among pregnant women treated with KT compared to those managed with support devices (19,20). While belts improve stability and reduce mechanical strain, their restrictive nature may limit functional independence, particularly in women who remain active during pregnancy. KT, by contrast, provides support while permitting full range of motion, which is likely to contribute to better performance in mobility-based assessments.

From a clinical perspective, the findings are highly relevant to maternal healthcare in low- and middle-income countries such as Pakistan, where non-pharmacological, low-cost, and accessible interventions are essential. Both KT and PSB meet these criteria; however, KT offers additional benefits by allowing women to remain functionally independent without significant restrictions. This is particularly important in cultural contexts where women may be expected to maintain household or caregiving responsibilities during pregnancy. Integrating KT into routine antenatal physiotherapy could therefore enhance quality of life, mobility, and psychological well-being for affected women.

The study's strengths include a randomized design, balanced baseline characteristics, and the use of validated outcome measures such as the VAS and TUG test. However, several limitations must be acknowledged. First, the trial was single-center with a relatively modest sample size, which may limit generalizability. Second, although outcome assessors were blinded, participants could not be blinded to the intervention due to its nature, which introduces potential performance bias. Third, the follow-up period was limited to four weeks, preventing assessment of long-term outcomes. Fourth, reliance on subjective pain measures such as the VAS may have introduced reporting bias, although combining with functional measures mitigates this limitation.

Future research should focus on larger multicenter randomized trials to confirm these findings and explore long-term outcomes of KT and PSB. Additionally, studies investigating the cost-effectiveness of KT compared to belts, as well as trials combining KT with exercise-based physiotherapy programs, may provide more comprehensive strategies for managing PGP. Consideration of psychosocial variables, adherence, and cultural acceptability will also be essential in developing context-specific interventions for maternal populations.

In summary, the present study adds to the growing body of evidence supporting KT as a preferable intervention for PGP during pregnancy. While both KT and PSB are effective, KT provides superior benefits in pain relief and mobility, making it a valuable addition to antenatal physiotherapy practice, particularly in low-resource healthcare settings.

CONCLUSION

This randomized controlled trial demonstrated that both Kinesio Taping and Pelvic Support Belts effectively reduced pain and improved functional mobility in pregnant women with pelvic girdle pain. However, Kinesio Taping produced significantly greater improvements across both outcomes, suggesting its superiority as a conservative intervention. Given its safety, affordability, and ability to support functional independence, Kinesio Taping should be considered a preferred option for physiotherapy management of pelvic girdle pain in pregnancy. Future multicenter studies with larger samples and longer follow-up are warranted to validate these findings and to evaluate their sustainability over time.

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