

Effect of Kinesio tape application on quality of life and functional independence among Nulligravida women with Primary dysmenorrhea: A Randomized control trial

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ABSTRACT

Background & Purpose: Dysmenorrhea has a high impact on the quality of living and functional independence is restricted. This study focuses on the new approach known as taping on dysmenorrhea in alleviating pain and improving quality of life. **Methods:** A total of 66 subjects after satisfying inclusion criteria were recruited and randomly divided into two groups, Group A (control)(n=32) and Group B (Experimental)(n=34) after obtaining written consent. Group A (Control group)- Single-day dose of Pain - relieving medications administered three times a day and repeated on the first day of menstruation in the second month. Group B taping is applied for three days starting from the day of menstruation for the first month after enrollment, and then on the second month. **Results:** Repeated measures ANOVA determined that mean GPS levels differed statistically between time points and between the groups with time at $p < 0.001$. The post hoc comparisons revealed that the results were significant after the second month of application. The effect size was revealed to a large effect size. **Conclusion:** From the results attained, this study concludes that a series of sequential taping for a minimum period of 2 months improves the quality of life and functional independence in nulligravida women.

Keywords: Dysmenorrhea, physiotherapy, kinesio taping, GPS

INTRODUCTION

Menstruation is a natural process that takes place every month. Most of the women suffer from dysmenorrhea. Dysmenorrhea is a painful period resulting in painful cramps due to the release of a chemical substance, prostaglandin which makes the uterus contract during menstruation (Proctor & Farquhar, 2006). Primary dysmenorrhea does not have any underlying pathology whereas secondary dysmenorrhea is associated with visible pelvic pathology (Sriprasert I & Suerungruang, 2015). The prevalence of dysmenorrhea in nulliparous women was reported as 58%, and 17% present intolerable dysmenorrhea (Potharaju & Usha, 2017). Dysmenorrhea is a women's health burden and substantially impacts the quality of life (Mannix, 2008; Ozerdogan et al, 2009). Dysmenorrhea causes impairment and altered social roles, which hampers the quality of life (Latthe et al, 2006).

Kinesio taping is a relatively new modality for the treatment of choice for a clinician. It facilitates the body's natural healing

process while allowing support and stability to muscles without restricting the activities of daily living (Talar & Miaskowski, 2002). Kinesio taping is used for neuromuscular re-education, and pain reduction, to improve quality of life and improve circulation and healing (Ylikorkala & Dawood, 1978). KT is applied from muscle insertion to origin to produce eccentric pull on the underlying fascia, inhibiting or decreasing the muscle contraction (Basset, et al., 2010). Dysmenorrhea is associated with many risk factors like psychological and behavioural aspects, age < 20, nulliparity, heavy menstrual flow, smoking, high socioeconomic factors, attempt to lose weight, less physical activity, disruption of social network, depression, anxiety are trouble factors of dysmenorrhea (Osawande & Mehulic, 2014). which influences the quality of life and functional independence.

AIMS AND OBJECTIVE

The study aims to find out the efficacy of Kinesio tape application on quality of life and functional independence among nulligravida women with primary dysmenorrhea.

- 1 To assess the functional independence and quality of life among the women with dysmenorrhea.
- 2 To find out the effect of taping on functional independence and quality of living in women with dysmenorrhea.

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MATERIALS AND METHODS

Enrollment & Recruitment: This study was conducted at the Department of Obstetrics and Gynecology in association with the Physiotherapy Department of our university. It is a single-blind randomized control trial where the subjects were blinded. A total of 115 patients attending the OBG outpatient department were screened and 66 subjects after satisfying inclusion criteria were recruited and randomly divided into two groups, Group A (experimental) (n=34) and Group B (control) (n=32) by computerized randomization. Written informed consent was taken from all the subjects before recruitment. (Figure 1)

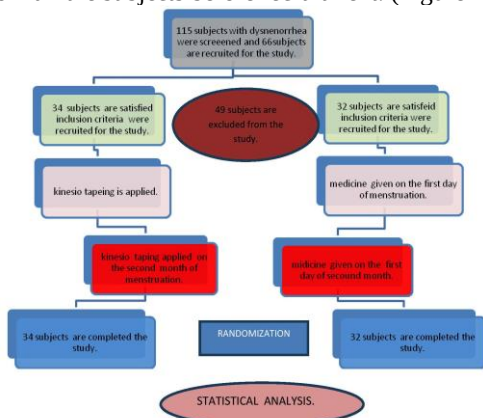


Fig:1 Consort chart

Females of the age group 18 to 30 years (nulligravida), patients willing to participate with a confirmed diagnosis of primary dysmenorrhea, conscious and coherent, and having regular menstrual bleeding are included in the study. Dysmenorrhea with other gynaecological conditions, allergy to tape, local unhealed wounds or scars, and pain due to other musculoskeletal reasons are excluded from the study. This study got ethical clearance from the institutional ethical committee. (Ethical no: 1056/UPUMS/DEAN(M)/Ethical/2020-21) and the trial is registered with Clinical Trials of India (CTRI), reg.no: CTRI/2020/07/026552.

Intervention:

GROUP A (Experimental group): Kinesio taping is applied for three days starting from the day of menstruation for the first month after enrollment, then in the second month, the procedure is repeated.

GROUP B (Control group): Single-day dose of Pain-relieving medications containing Dicyclomine (10mg) and Mefenamic acid (250 mg) administered three times a day on the recommendation of a gynaecologist and the dose repeated on the first day of menstruation in the second month.

Technique of application: The subject is made to lie supine on the treatment couch with proper screening for privacy. Kinesio tape is applied to the abdominal and lumbar area. A piece of Kinesio tape, which is 5 cm in width and 8 cm in length is applied below the umbilicus and stretched down to the pubic line where the pubic hair begins. Another piece of tape 5 cm in width and 10 cm in length is applied horizontally to make a cross shape with the first one with minimal stretch. (Figure 2).

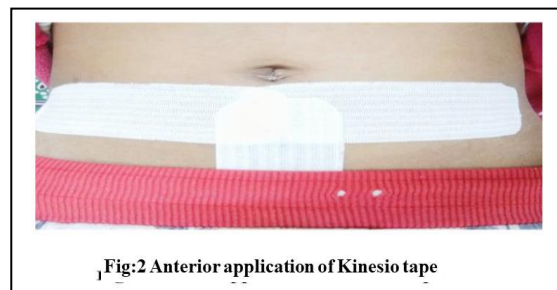


Fig:2 Anterior application of Kinesio tape

Then the patient was made to sit on a couch, and a tape of width 5 cm and length 6 cm was applied horizontally on the spinous process of the L5 vertebra. (Fig 3)

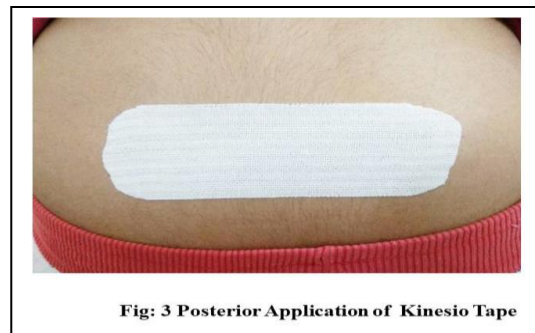


Fig: 3 Posterior Application of Kinesio Tape

Outcome measures: All the demographic characteristics of the subjects were recorded at the time of enrollment and recruitment of subjects. The quality of life and functional independence were assessed using subsections of the Global Pain Scale (GPS). The assessment of GPS was taken pre-intervention at the time of enrollment (t0), 12 hours (t1), 24 hours (t2), 48 hours (t3) post application of the tape, follow up a month before application of tape (t4), 12 hours after application of second-month tape (t5), 24 hours later (t6), and, 48 hours later (t7).

GPS can be used as a bedside repeated assessment tool over time in both acute and chronic pain states. It is a biopsychosocial model, which feedback on the degree to which pain interferes with daily activities of living and the psychological impact of pain on the quality of living.

In this study, we have taken two subsections of GPS (Clinical outcomes and activities) for assessing the quality of life (Clinical outcomes) and functional independence (activities). The clinical outcomes and activities sections have 5 items each. Each item has a minimum score of 0 and a maximum score of 10. The total score is the sum of all items in each section.

Statistical analysis: In this study, descriptive statistics were calculated for the baseline characteristics of the groups and were tested for normality by the D'Agostino-Pearson test. Homogeneity was estimated by independent t-test at $p < 0.05$ level of significance. The GPS scores were expressed in mean and standard deviation. The Pre-test and Post-test scores were analyzed for statistical differences within the group and between the groups by repeated measures ANOVA at a 5% level of significance ($p < 0.05$). We used multiple comparison tests by Bonferroni correction for post hoc comparison. To explore the practical significance of group differences, the effect size was calculated by partial eta square test and Cohen's f .

RESULTS

In this study, to analyze the effects of taping on dysmenorrhea, descriptive statistics were calculated for the baseline characteristics of the groups and were tested for normality by the D'Agostino-Pearson test showed that both the groups are statistically different ($p > 0.05$), and passed the normality test (Table 1).

Table 1: Socio-demographic & Clinical Profile

Socio-demographic & Clinical Profile	Group A Mean $\pm$ SD	Group B Mean $\pm$ SD	P Value	Sig. Level
Age (year)	21.59 $\pm$ 3.24	20.58 $\pm$ 2.41	0.5197	$p > 0.05$
Age of menarche	14.93 $\pm$ 1.04	14.52 $\pm$ 1.16	0.4204	$p > 0.05$
Days of menstruation	4.87 $\pm$ 0.33	4.94 $\pm$ 0.34	0.066	$p > 0.05$
No sanitary napkins	3.68 $\pm$ 0.82	3.67 $\pm$ 0.72	0.87	$p > 0.05$
Weight (kg)	51.93 $\pm$ 6.21	50.82 $\pm$ 6.37	0.79	$p > 0.05$
Height (cm)	158.31 $\pm$ 5.31	159.85 $\pm$ 5.23	0.75	$p > 0.05$
Body mass index	20.83 $\pm$ 2.1	19.97 $\pm$ 2.3	0.59	$p > 0.05$
BP (systolic)	120.5 $\pm$ 6.03	119.9 $\pm$ 3.56	0.27	$p > 0.05$
BP (diastolic)	77.75 $\pm$ 6.75	78.58 $\pm$ 6.1	0.38	$p > 0.05$

The means of GPS scores for quality of life and functional independence showed that the scores improved better in Group A than in group B.

Repeated measures ANOVA with a Greenhouse-Geisser correction determined that mean QOL scores and Functional independence scores of GPS differed statistically significantly between time points and between the groups with time was statistically significant at $p < 0.001$ (Table 2,3,4,5).

Table 2: Repeated Measures ANOVA for Quality of Life Between-Subjects Effects

Source of variation	Sum of Squares	<i>df</i>	Mean Square	<i>f</i>	<i>p</i>
Group A & B	2132.423	1	2132.423	41.23	<0.001
Residual	3310.132	64	51.721		

Post hoc tests using the Bonferroni correction revealed that taping elicited an improvement in QOL based on GPS scores from pre-intervention to 12 hours of application, which was not statistically significant ($t = 0.182$). From 12 hours of post-taping to 24 hours of post taping which was not statistically significant ($t = 0.539$), 24 hours of application of tape to 48 hours after

Table 3: Repeated Measures ANOVA Test for Quality of Life Within-Subjects Effects

Source of variation		Sum of Squares	<i>df</i>	Mean Square	<i>f</i>	<i>p</i>
Quality of Life	Sphericity assumed	24046.232	7	3435.176	173.95	<0.001
	Greenhouse-Geisser	24046.232	3.925	6126.524	173.95	<0.001
	Huynh-Feldt	24046.232	4.213	5707.068	173.95	<0.001
Group x Factor interaction	Sphericity assumed	850.444	7	121.492	6.15	<0.001
	Greenhouse-Geisser	850.444	3.925	216.677	6.15	<0.001
	Huynh-Feldt	850.444	4.213	201.842	6.15	<0.001
Residual	Sphericity assumed	8846.956	448	19.748		
	Greenhouse-Geisser	8846.956	251.196	35.219		
	Huynh-Feldt	8846.956	269.658	32.808		

Table 4: Repeated Measures ANOVA Test for Functional Independence Between-Subjects Effects

Source of variation	Sum of Squares	<i>df</i>	Mean Square	<i>f</i>	<i>p</i>
Groups (group)	2482.785	1	2482.785	45.63	<0.001
Residual	3482.094	64	54.408		

Table 5: Repeated Measures ANOVA Test for Functional Independence Within-Subjects Effects

Source of variation		Sum of Squares	<i>df</i>	Mean Square	<i>f</i>	<i>p</i>
Functional Independence levels	Sphericity assumed	26591.571	7	3798.796	144.97	<0.001
	Greenhouse-Geisser	26591.571	3.677	7232.506	144.97	<0.001
	Huynh-Feldt	26591.571	3.929	6768.782	144.97	<0.001
Group x Factor interaction	Sphericity assumed	991.200	7	141.600	5.40	<0.001
	Greenhouse-Geisser	991.200	3.677	269.591	5.40	<0.001
	Huynh-Feldt	991.200	3.929	252.306	5.40	<0.001
Residual	Sphericity assumed	11739.739	448	26.205		
	Greenhouse-Geisser	11739.739	235.307	49.891		
	Huynh-Feldt	11739.739	251.428	46.692		

application of the tape, the results were statistically significant $p < 0.05$. ($t = 1.59$), 48 hrs after application to pre-intervention on the second month, the results were statistically significant at $p < 0.05$ ($t = 3.19$), 24 hrs of application to 12 hrs of application, the results were statistically significant at $p < 0.05$. ($t = 3.82$), 48 hrs of application to 24 hrs, the results are statistically significant at $p < 0.05$ ($t = 4.50$). Post hoc tests using Bonferroni correction revealed that taping elicited an improvements in functional independence levels based on GPS scores from pre-intervention to 12- hours of application, which was not statistically significant ($t = 0.0181$), 12 hrs of post-taping to 24 hrs of post-taping which was not statistically significant ($t = 0.745$), 24 hours of application of tape to 48 hrs after application of the tape, the results were not statistically significant $p < 0.05$ ($t = 1.547$), 48 hrs after application to pre-intervention on the second month, the results were not statistically significant $p < 0.05$ ($t = 2.495$), 24hrs of application to 12 hrs of application, the results were statistically significant at $p < 0.05$ ($t = 3.009$), 48 hrs of application to 24hrs, the results were statistically significant at $p < 0.05$ ($t = 4.703$). The effect size was calculated by partial eta-squared test and Cohen's f revealed a large size effect size ($f = 0.78$) (table 6,7).

Table 6: Post-hoc Comparison of Effects of Kinesiotaping on Quality of Life in Dysmenorrhea

Comparison	Significant? ($P < 0.05$?)	<i>t</i>
1: 0	No	0.182
2: 1	No	0.539
3: 2	No	1.591
4: 3	Yes	3.193
5: 4	No	2.780
6: 5	Yes	2.846
7: 6	Yes	3.826
8: 7	Yes	4.503

Table 7: Pos-thoc Comparison of Effects of Kinesiotaping on Functional Independence in Dysmenorrhea

Comparison	Significant (P <0.05)	t
1: 0	No	0.181
2: 1	No	0.745
3: 2	No	1.547
4: 3	No	2.586
5: 4	No	2.495
6: 5	Yes	3.009
7: 6	Yes	3.258
8: 7	Yes	4.703

DISCUSSION

In this study to find out the efficacy of Kinesio taping application on quality of life and functional independence among nulligravida women with primary dysmenorrhea the result revealed that in the second month, for the initial 12 hours of post-application, the results were not statistically significant. However, after 24 hours and 48 hours of post-application, the results were statistically significant. Kinesio taping works on the principle of the natural healing process and corrects the balance of the human body by adjusting electromagnetic flows on the skin, indirectly stimulating the muscle and organs under the skin using non-chemically treated tape (Lim et al., 2013; Melzack & Wall, 1965). It also increases the lymphatic and vascular flow and normalizes vascular functions. This helps in diminishing pain and improving quality of living and functional independence (Wu et al., 2015). In clinical practice, Kinesio tape application is applied in sports injuries and postoperative complications, other pain-related conditions and many other conditions. Some studies also revealed that Kinesio tape application is self-manageable and therapy of treatment) It has been reported that by previous researchers 90% of adolescent females experience menstrual pain and 15 % feel it is severe and may hinder their lifestyle and functional independence (French, 2005). The research by HanifeDogan et al. (2020), concluded that Kinesio taping alleviates pain and improves body awareness and quality of life in primary dysmenorrhea. Some studies revealed that kinesio taping causes vasodilation of arterioles in the pelvic region, thus facilitating the bleeding and excretion of wastes containing prostaglandin that causes contraction (Khare & Jain, 2016).

CONCLUSION

From the results attained, this study concludes that Kinesio taping improves the quality of living and functional independence in primary dysmenorrhea. It is recommended over drug therapies as it is cost-effective, has less or no side effects, is easy and self-administered, has minimal contraindications that suit most women and doesn't require medical professional supervision for application.

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