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The Effect of Kinesio Taping on Pain and Physical Activity in Adolescents with Primary Dysmenorrhea

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ABSTRACT

Background: Dysmenorrhea is a painful cramp that occurs during menstruation and is a common cause of pelvic pain and menstrual disorders. Symptoms of dysmenorrhea last for 24-48 hours which can interfere with physical activity. Kinesio taping administration is done as one way to reduce the level of dysmenorrhea pain in adolescents. The aim was to determine the effect of kinesio taping on pain and physical activity in adolescents with primary dysmenorrhea.
Method: Quasi-experimental with pre-test post-test control group design. The study was conducted at SMAS IT Tariq bin Ziyad, Bekasi, West Java in May. A total of 8 participants are included in this study. The independent variable is Kinesio taping. The dependent variable is pain and physical activity dysmenorrhea. Physical activity using questionnaires of physical activity level (PAL) and visual analogue scale (VAS) to measure the degree of pain dysmenorrhea. Data analysis using Wilcoxon Signed Ranks test and Whitney difference test.
Result: Results after administration of KT in the control group, Wilcoxon Signed Ranks test VAS (p=0.109)PAL (p=0.068) and Maan Whitney test VAS (Mean=4.75; p=0.767) and PAL (Mean=6.00; p=0.083).
Conclusion: Kinesio taping can influence the pain of primary dysmenorrhea by reducing the level of pain felt and can improve physical activity and quality of life in adolescents with primary dysmenorrhea.

Keywords*: primary dysmenorrhea, kinesio taping, adolescent, physical activity*

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INTRODUCTION

The World Health Organization (WHO) in 2017 stated that 1,769,425 people or 90% of the female population in the world experienced dysmenorrhea (Nurwana et al., 2017). The incidence of dysmenorrhea in Indonesia reached 64.25% with the percentage of primary dysmenorrhea 54.89% and secondary dysmenorrhea 9.36%. According to Mahmudiono (2011) in (Widyanthi et al., 2021), the prevalence of primary dysmenorrhea in Indonesia reached 58.89% in adolescent girls with an age range of 14-19 years. During the menstrual period, 72.7% of female students felt restless or nervous, 66.9% were easily tired, 75.9% had little energy for daily activities, 57.9% experienced high levels of stress, and 30% had difficulty dieting. In addition, 49.4% had difficulty attending lectures, 34.5% had social life, 29.6% had relationships with partners, 21.4% had relationships with family and 15.4% with friends, depending on the duration and intensity of pain from dysmenorrhea felt (Sima et al., 2022).
Dysmenorrhea in English is called Painful periods or painful menstruation (American College of Obstetricians and Gynecologists, 2015; Sinaga et al., 2017). Dysmenorrhea is a painful cramp that

originates in the uterus and occurs during menstruation which is a common cause of pelvic pain and menstrual disorders. The International Association for the Study of Pain defines pain as an unpleasant sensory and emotional experience related to tissue damage or potential (Petraglia et al. 2017). Symptoms of dysmenorrhea (menstrual cramps or menstrual pain) are felt when menstruation begins or a few hours before or after menstruation. These symptoms can last for 24-48 hours (Omidvar et al., 2015 Karim, 2019). Handling of dysmenorrhea is given to reduce symptoms caused by physiological mechanisms such as increased prostaglandin hormones (Karim 2019). Many ways that can be done to reduce the pain of primary dysmenorrhea include the administration of drugs and non-drugs. Drugs can give NSAIDs and non-Drug Administration of physiotherapy modalities can be done (Wahyuni et al., 2019). One of them is kinesio taping.

A study from Spain, Mejías-Gil et al. (2021) conducted the same study related to the effect of kinesio taping on primary dysmenorrhea using female subjects with an age range of 18 to 30 years at the University of Extremadura while the same study with high school adolescent subjects was still not widely conducted. In previous studies, the application of kinesio taping to dysmenorrhea was conducted in late teenage women and adult women had not focused on adolescents with a 14–16 year age range or adolescents in the early adult phase who were in middle school. so based on this background and the presence of the necessary subjects, the researchers were interested in conducting this study by focusing on the pain and physical activity of adolescents with primary dysmenorrhea performed on female adolescent subjects at SMAS IT Thariq bin Ziyad.

METHOD

This study has been through the ethical feasibility test at RS TK.II 04.05.01 dr. Soedjono, Magelang with ethics number 498/EC/VIII/2023 uses the Quasi-Experimental method with pre-test and post-test control group design, comparing two groups. The first group was given kinesio taping and the second group without kinesio taping. The aim was to determine the effect of kinesio taping on pain and physical activity in adolescents with primary dysmenorrhea. The study was conducted at SMAS IT Thariq bin Ziyad, Bekasi, West Java in May.

The population of this study is a student of Class X MIPA 2 SMAS IT Thariq bin Ziyad aged 15-17 years who experiences primary dysmenorrhea and is in a normal menstrual cycle. Sampling using the Accidental Sampling technique and has passed the selection process by the criteria of inclusion and exclusion

Table 1. Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
Teenagers with ages 15-17	Secondary Dysmenorrhea
Student class X MIPA 2 SMAS IT Thariq bin Ziyad	*Istihadhoh*
Primary Dysmenorrhea	Amenorrhea
Normal menstrual cycle	Bad menstrual cycle
	Allergy to plaster wounds and the like
	Sensitive skin

Physical activity was measured using physical activity level (PAL) and visual analogue scale (VAS) questionnaires to measure the degree of dysmenorrhea pain. Data analysis was conducted using univariate and bivariate analysis. Univariate analysis is based on participant characteristic data, while bivariate analysis uses the Wilcoxon Signed Ranks test and Whitney Maan difference test.

RESULTS

1. Sample Characteristics

This study used a sample of *SMAS IT Tariq bin Ziyad* students aged 15-17 years. Table 2 shows that the response in Groups 1 and 2 is in the age range of 15-16 years. The age of respondents in Group 1 in Table 2 is seen to be at the same percentage of 50% and in Group 2 the most age data of respondents is at the age of 16 years with a percentage of 75% and the lowest at 25% with the age of 15 years. Then the respondent's height was at a percentage of 50% in Group 1 of the experiment and Group 2 of the control with a size

range of 150-169 cm. For weight, in Group 1 the highest respondent's weight with the range of 40-49 kg with a percentage of 75% and in Group 2 respondent's weight was the same percentage of 50%.

Table 2. Sample Characteristics

Characteristics	Group 1 (n=4)		Group 2 (n=4)	
	n	%	**n**	%
Gender				
Female	4	100%	4	100%
Age (years)				
15	2	50%	1	25%
16	2	50%	3	75%
17	0	0%	0	0%
Height (cm)				
140-149	0	0%	0	0%
150-159	2	50%	2	50%
160-169	2	50%	2	50%
170-179	0	0%	0	0%
Weight (kg)				
40-49	3	75%	2	50%
50-59	1	25%	2	50%
60-69	0	0%	0	0%

Table 3 represents the distribution of dysmenorrhea pain in Group 1 of the experiment. Before the administration of kinesio taping, the pain value of respondents in the mild and moderate categories with a percentage of 50% each and the pain value after the administration of kinesio taping in the mild category has the largest percentage value with a value of 75% with a value of 25% in the medium category.

Table 3. Distribution Of Pain Dysmenorrhea Group 1 Experiments

No	Interval	Category	Pre		Post	
			n (n=4)	**%**	**n** (n=4)	**%**
1.	1-3	Low	2	50%	3	75%
2.	4-6	Moderate	2	50%	1	25%
3.	7-10	Severe	0	0%	0	0%
Total			4	100%	4	100%

Table 4 represents the distribution of dysmenorrhea pain in 2 control groups. According to the table, the value of pain before kinesio taping administration has the largest percentage in the mild category with a value of 50%. The value of dysmenorrhea pain after administration of kinesio taping is in the mild category and has the largest percentage value of 75%.

Table 4. Distribution Of Pain Dysmenorrhea 2 Control Groups

No	Interval	Category	Pre		Post	
			n=4	**%**	n=4	**%**
1.	1-3	Low	2	50%	3	75%
2.	4-6	Moderate	1	25%	1	25%
3.	7-10	Severe	1	25%	0	0%
Total			4	100%	4	100%

The figure below is a graph of the average dysmenorrhea pain using a Visual Analog Scale (VAS). In Group 1, there was a decrease in pain in VAS 1, 2, and 4 while VAS 3 had the same score. Then Group 2 saw a decrease in 1-4.

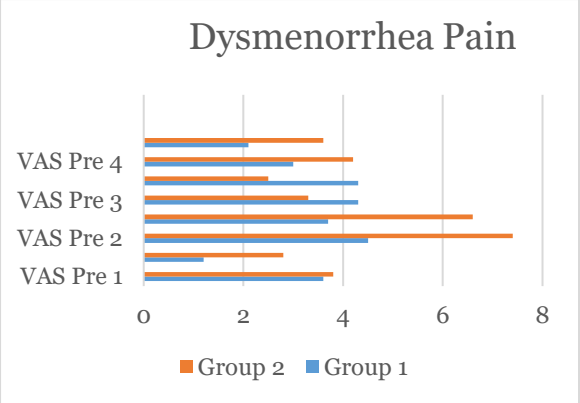

Figure 1. Dysmenorrhea Pain Chart

Table 5 shows that before the administration of kinesio taping in respondents, the value of physical activity was in the heavy and medium categories with a percentage of 50% in each category. Then the value of physical activity after administration of kinesio taping has a percentage of 25% for the heavy category and 75% for the light category.

Table 5. Distribution Of Physical Activity Values Of Group 1 Experiments

No	Interval	Category	Pre		Post	
			n (n=4)	%	n (n=4)	%
1.	2.00-2.40	Severe	1	25%	1	25%
2.	1.70-1.99	Moderate	1	25%	2	50%
3.	1.40-1.69	Low	2	50%	1	25%
Total			4	100%	4	100%

Table 6 shows the distribution of physical activity values of respondents in the 2 control groups, before the administration of kinesio taping, the physical activity values of respondents in the heavy and medium categories had the same frequency with a percentage of each category of 25%. Then the value of physical activity after administration of kinesio taping in the heavy and light categories had the same frequency with a percentage of 25% while the medium category had a percentage value of 50%.

Table 6. Distribution Of Physical Activity Values Of 2 Control Groups

Interval	Category	Pre		Post	
		n=4	%	n=4	%
2.00-2.40	Severe	2	50%	1	25%
1.70-1.99	Moderate	2	50%	0	0%
1.40-1.69	Low	0	0%	3	75%
Total		4	100%	4	100%

2. Bivariate Analysis

Non-parametric test using Wilcoxon Signed Ranks test. Based on Table 7, group 1 VAS obtained a value of 2-tailed (0.109) yang which results from the administration of kinesio taping that can reduce dysmenorrhea pain in adolescents. Then in Group 2, VAS found the value of p-value (p= 0.066) so it can be concluded
that the administration of kinesio taping can reduce the pain of dysmenorrhea in adolescents. In Group 1 PAL 2-tailed value (0.068) it was concluded that the administration of kinesio taping can increase physical activity in adolescents with dysmenorrhea pain. Furthermore, in Group 2 PAL the value of 2-tailed (0.715) means that the administration of kinesio taping can increase physical activity in adolescents with dysmenorrhea pain. After obtaining the results of the Wilcoxon signed ranks test, followed by different effects test using the Whitney main test. From the results of Table 8, it is stated that the value of VAS has a p-value (p= 0.767). From these results, it means that there are differences in the level of pain reduction in the group given kinesio taping and those not given kinesio taping. Then, the PPAL value is obtained p-value (p= 0.083), and the result is distated that there is a difference in the level of physical activity in the group given kinesio taping and not given kinesio taping.

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Table 7. Wilcoxon Signed the Ranks test
Table 8. Maan Whitney Test

DISCUSSION

Primary Dysmenorrhea is a common gynaecological disease that often occurs in women during menstruation and is the cause of high rates of absenteeism in school and work, as well as decreased quality of life. An investigation was conducted to determine the effect of kinesio taping on primary dysmenorrhea (Guimarães and Póvoa, 2020).

This study conducted experiments on high school students aged 15-16 years with primary dysmenorrhea. The experiment was carried out in 6 sessions, starting on the 14th day of the menstrual cycle and 2 times a week for 3 weeks until the cycle ended (Temizkan, 2021). Respondents who conducted this experiment were selected by the provisions of the inclusion and exclusion criteria and then formed into two groups. Group 1 was the experimental group with kinesio taping and Group 2 was the control group without kinesio taping.

In Group 1 experiments obtained the results that kinesio taping can reduce pain in dysmenorrhea. It can be seen from the average graph of dysmenorrhea pain measured using a VAS shows that there is a decrease in the degree of pain felt. (Toprak Celenay et al. 2020) also conducted a study using kinesio taping in women with primary dysmenorrhea (kinesio taping group) and compared it with the sham tape group and the control group (without taping application) which after application found in the kinesio taping group, pain intensity, anxiety level and some menstrual complaints such as low back pain, swelling of the abdomen, fatigue, nausea, insomnia, nervousness and depression may decrease. (Golhar et al. 2020) mentioned that the administration of kinesio taping on dysmenorrhea pain showed significant results with a decrease in dysmenorrhea pain. The application of kinesio taping is efficient for controlling menstrual pain in young women (Boguszewski et al. 2021). (Koo et al. 2018) also mentioned that kinesio taping has effectively reduced menstrual disorders, pain and PGF2a. Kinesio taping lowers muscle tone and reduces pain by inducing constant muscle relaxation and contraction through afferent stimulation in the skin. Kinesio taping applied to the lower abdomen stimulates tactile fibres of the skin to suppress the action of prostaglandins in the spinal cord, thereby reducing pain. Then, kinesio taping not only relieves musculoskeletal pain but also menstrual pain, namely internal pain (Lim et al. 2013).

Measurement	Description	Mean	Significance (2-*tailed*)
VAS	K1 Post-Pre	4.75	0.767
	K2 Post-Pre	4.25	
PAL	K1 Post-Pre	6.00	0.083
	K2 Post-Pre	3.00	

Measurement	Description	Z	Significance (2-*tailed*)
VAS	K1 Post-Pre	-1.604[b]	0.109
	K2 Post-Pre	-1.841[b]	0.066
PAL	K1 Post-Pre	-1.826[b]	0.068
	K2 Post-Pre	-0.365[b]	0.715

Then, the Control Group 2 of this study showed that there was a decrease in pain in dysmenorrhea. Do *et al*., 2003 (C, 2017.) also conducted a similar study and reported that the use of kinesio taping in a horizontal position in the abdominal area perf was formed for 2 weeks and kinesio taping in a cross position in the area the sacroiliac area can reduce pre-and post-inflammatory symptoms, and menstrual cramps in the experimental group compared to the control group not given kinesio taping. Then in the test of different effects, both groups showed that there were different levels of dysmenorrhea pain in the group with kinesio taping and control groups. This can be seen in the graph in Figure 1, where it can be seen that each individual has a different level of value and varies. The level of menstrual pain of each individual is different from each other (Eka Putri and Ardiani Putri, 2020), in addition, the level of pain can also be influenced by psychological problems such as stress, depression and anxiety (Afriany 2020).

In physical activity, experimental group 1 and control group 2 showed similar results where kinesio taping can increase physical activity in adolescents. According to the results of the WHO

2020 guidelines on physical activity and sedentary behaviour, physical activity in children and adolescents aged 5-17 years collects 60 minutes of moderate to vigorous physical activity (MVPA) every day (Bull et al. 2020). Kanti et al. (2022) concluded that kinesio taping can reduce pain from primary dysmenorrhea and functional independence. One potential mechanism of kinesio taping is lowering the threshold of motor neurons that can be induced by skin irritation and result in easier recruitment of motor units and increased functional performance (Maratou, 2000 in Lee and Lim, 2020). In addition, Doğan et al. (2020) concluded that the use of kinesio taping can relieve pain and improve body awareness and quality of life in primary dysmenorrhea. In addition, Kinesio also reduces inflammation and improves joint movement by increasing blood flow and lymph circulation (Stedge et al., 2012). It helps relieve pain by reducing pressure on subcutaneous nociceptors and facilitates joint and muscle function by increasing sensory feedback and muscle activation to prevent injury, rehabilitation and improve functional performance (Lee and Lim, 2020). Some of the positive effects of kinesio taping may indirectly affect pain levels and disability, such as normalizing muscle tone, and improving postural control, range of motion, circulation and proportionality (Abbasi et al., 2020). The different effects of the test showed that there were different levels of physical activity in the group with kinesio taping and control groups. This is shown in Table 5. Distribution of physical activity scores using physical activity level It appears that adolescents' physical activity level scores vary greatly, from the highest interval with a heavy category to the lowest interval with a light category. So, it can be concluded that kinesio taping can improve physical activity and quality of life in adolescents with primary dysmenorrhea pain.

Limitations and shortcomings of this study, it is difficult to find respondents who match the intervention tool due to allergies in the form of itching and required checking of the menstrual cycle each month from the respondents and did not determine the number of respondents in 1 menstrual cycle due to differences in the cycle of each respondent.

CONCLUSION

Kinesio taping was able to influence the pain of primary dysmenorrhea with a decrease in the level of pain felt and can improve physical activity and quality of life in adolescents with primary dysmenorrhea, thereby reducing school attendance.

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