



Journal of Health and Medical Sciences

Suindri, Ni Nyoman, Erawati, Ni Luh Putu Sri, Darmapatni, Made Widhi Gunapria, and Sriasih, Ni Gusti Kompiang. (2021), Primary *Dysmenorrhea* Intensity Between Stretching Abdominal Therapy and Acupressure to Adolescent Girls. In: *Journal of Health and Medical Sciences*, Vol.4, No.3, 58-64.

ISSN 2622-7258

DOI: 10.31014/aior.1994.04.03.179

The online version of this article can be found at:
<https://www.asianinstituteofresearch.org/>

Published by:
The Asian Institute of Research

The *Journal of Health and Medical Sciences* is an Open Access publication. It may be read, copied, and distributed free of charge according to the conditions of the Creative Commons Attribution 4.0 International license.

The Asian Institute of Research *Journal of Health and Medical Sciences* is a peer-reviewed International Journal. The journal covers scholarly articles in the fields of Medicine and Public Health, including medicine, surgery, ophthalmology, gynecology and obstetrics, psychiatry, anesthesia, pediatrics, orthopedics, microbiology, pathology and laboratory medicine, medical education, research methodology, forensic medicine, medical ethics, community medicine, public health, community health, behavioral health, health policy, health service, health education, health economics, medical ethics, health protection, environmental health, and equity in health. As the journal is Open Access, it ensures high visibility and the increase of citations for all research articles published. The *Journal of Health and Medical Sciences* aims to facilitate scholarly work on recent theoretical and practical aspects of Health and Medical Sciences.



ASIAN INSTITUTE OF RESEARCH
Connecting Scholars Worldwide



Primary *Dysmenorrhea* Intensity Between Stretching Abdominal Therapy and Acupressure to Adolescent Girls

Ni Nyoman Suindri¹, Ni Luh Putu Sri Erawati², Made Widhi Gunapria Darmapatni³, Ni Gusti Kompiang Sriasih⁴

^{1,2,3,4}Department of Midwifery, Poltekkes Kemenkes Denpasar, Denpasar, Bali, Indonesia

Correspondence: Ni Nyoman Suindri, Department of Midwifery, Poltekkes Kemenkes Denpasar, Bali, Indonesia. E-mail: ninyomansuindri@yahoo.com

Abstract

Menstrual pain or dysmenorrhea is known as cramping pain in the lower abdomen during menstruation experienced by some women. Abdominal stretching exercises and acupressure can reduce dysmenorrhea. This research aims to determine the difference in the intensity of primary menstrual pain (dysmenorrhea) between abdominal stretching therapy and acupressure for adolescent girls in a Senior High School in Denpasar. The method applied in this research is a Quasi-Experimental two-groups pretest-posttest design. The research sample was grouped into two, namely 70 high school students in the abdominal stretching therapy and 70 students in acupressure therapy. The data were collected using the Numerical Rating Scales or NRS. The data were then analysed using the Wilcoxon test and Mann Whitney test. The result of the research showed that there was a significant difference in dysmenorrhea before and after abdominal stretching therapy ($p=0.000$). Also, there was a significant difference in dysmenorrhea before and after acupressure therapy ($p=0.000$). There was no difference in dysmenorrhea before applying abdominal stretching therapy and acupressure with a p -value=0.335. Also, there was no difference in dysmenorrhea after both therapies were undergone in two groups ($p=0,111$). The difference test on the difference between the pre-test and post-test obtained p -value = 0.012. Hence, there was a significant difference in decreasing dysmenorrhea between abdominal stretching therapy and acupressure ($p=0.012$). Conclusion: there is a significant difference in reducing dysmenorrhea between abdominal stretching therapy and acupressure. Suggestion: further research is necessary to conduct by using time series design.

Keywords: Primary *Dysmenhorrea*, Abdominal Stretching, Acupressure

1. Introduction

Dysmenorrhea is cramping pain before, during, and after menstruation. This disorder usually occurs 24 hours before the onset of menstrual bleeding and is felt for about 24 up to 36 hours. Dysmenorrhea in women is a symptom and not a disease due to uterine hyper contractility caused by prostaglandins. Prostaglandins could only cause pain, and it occurs when the level of progesterone in the blood is low (Barcikowska, et al. 2020). Severe

dysmenorrhea in women can affect them to carry out any activities and reduce their quality of life. Besides, dysmenorrhea is known as the main reason for the recurrent absence of female students from school. A study found that dysmenorrhea caused 14% of adolescent girls to often miss school (Ridwan & Herlina, 2015). The incidence of dysmenorrhea occurring in several countries is quite high such as in the United States, it is found that 60-91% of women in all regions experience dysmenorrhea. Their productivities are also tormented by pain during menstruation. At the moment, it is estimated that the prevalence of clinically significant symptoms is around 12.6%-31% of women at the age of menarche.

Abdominal stretching exercise is a muscle stretching exercise, especially in the abdominal done for 10 minutes. It is beneficial to increase muscle strength, endurance, and flexibility so that it is expected to lower menstrual pain (Bustan, et al. 2018). The abdominal stretching exercise itself is not much different from gymnastics. It can help increase oxygenation or the process of exchanging oxygen and carbohydrates in the cells and stimulate the flow of the lymph drainage system. As a result, it increases muscle flexibility by returning the muscles to their natural length. Additionally, it can maintain muscles function properly, restore the elasticity or flexibility of body tissues, and reduce muscle cramps. Abdominal stretching exercises can be leveraged as a non-pharmacological therapy to reduce the intensity of dysmenorrhea.

Another therapy to reduce dysmenorrhea is acupressure. Acupressure techniques can lower pain sensations by increasing endorphins, hormones that can naturally relax the body, and block pain receptors to the brain (Shady, et al. 2020). The pressure on acupressure points can affect endorphins production in the body. Endorphins are pain killers that the body produces itself. Endorphins are peptide or protein molecules made of a substance called beta-lipotropin found in the pituitary gland. Endorphins control the activity of the endocrine glands in which those molecules are stored. Endorphins can affect pain-sensing areas in the brain in a similar way to opiate drugs like morphine. Chen & Chen (2004) stated that acupressure therapy at the SP6 point reduces pain levels during dysmenorrhea. This point is located about three or four fingers above the internal malleolus, right at the end of the shinbone. The purpose of this research was to figure out the difference in the intensity of primary menstrual pain (dysmenorrhea) between abdominal stretching therapy and acupressure on adolescent girls in Denpasar Senior High School.

2. Method

This research is Quasi-Experimental with two groups pretest and posttest, and a prospective approach. In this research, the intensity of menstrual pain was measured twice, namely before the pretest, and after the treatment in the next menstrual cycle (posttest). The research used two treatment groups: group 1 with abdominal stretching therapy and group 2 with acupressure therapy. The sample of the study was tenth grader female adolescents in Denpasar Senior High School with inclusion criteria such as having primary dysmenorrhea and not taking analgesic drugs. The sample consists of 70 abdominal stretching therapy groups and 70 acupressure therapy groups. Abdominal stretching therapy in the form of abdominal muscle stretching exercises performed for 10 minutes with the following movements: cat stretch, lower trunk rotation, buttock/hip stretch, abdominal strengthening or curl up, lower abdominal strengthening and the bridge position. Acupressure therapy is undergone by massaging the highest prominence when the thumb and forefinger are brought together (point Li4/Hegu) with constant pressure for about 30 seconds. Abdominal stretching and acupressure therapy were done once a day which starts on the 14th day until the 28th day of menstruation.

The measurement of menstrual pain used a numerical rating scale (NRS) on a 0-10 scale. Scale 0 for complaints of menstrual pain or cramps in the lower abdomen. Scale 1-3 when the sample feels cramps in the lower abdomen, but they can bear it, still do activities, and concentrate on studying. Scale 4-6 is used if the respondents feel lower abdominal cramps that radiate to their waist, loss of appetite, some activities are hampered, and difficult to concentrate studying. On a scale of 7-9, there is a severe cramp in the lower abdomen that spreads to the waist, thighs or back, loss of appetite, gets nausea, fatigue, unable to move, and unable to concentrate on studying. Also, a scale of 10 indicates severe cramps in the lower abdomen spread to the waist, legs, and back, loss of appetite, getting nausea, vomiting, headache, feeling faint, and unable to get out of bed.

Then, the data were first descriptively analysed to determine the data distribution and continued with the data normality test. This study used the Smirnov Kolmogorov test for the data normality test with the limit of significance was $p \geq 0.05$ (Dahlan, 2019). If the data is normally distributed, it is then continued with paired t-test in the group and unpaired t-test in both groups, otherwise, if the data is not normally distributed, the Wilcoxon and Mann-Whitney test will be applied. The used limit of significance is $p < 0.05$. The ethical clearance of this research was obtained from the Ethics Commission of Poltekkes Kemenkes Denpasar.

3. Results

The results are divided into Table 1 – 6 showing the information on respondents' age and age at menarche, respondents' menstrual cycle, presence of stolsel (blood clot), period length, and dysmenorrhea duration, dysmenorrhea before and after the therapy, data normality test, the difference of dysmenorrhea before and after the applied therapy to the abdominal stretching and acupressure group, and the difference of primary dysmenorrhea between abdominal stretching and acupressure

Table 1: Respondents' Age and Age at Menarche

No	Characteristics	Abdominal Stretching Group	Acupressure Group
1	Age		
	Mean	15,20	15,17
	Median	15,00	15,00
	Std. Deviation	0,49	0,48
	Minimum	14,00	14,00
2	Age at Menarche		
	Mean	12,08	12,17
	Median	12,00	12,00
	Std. Deviation	1,11	0,86
	Maximum	15,00	14,00

Table 1 shows that the respondents' age in the abdominal stretching group is a maximum of 17 years old, the mean is 15,20, and the median is 15,00. Besides, the maximum age in the acupressure group is 16 years old, the mean is 12.17, and the median is 12.00. Additionally, the maximum age range of menarche in the abdominal stretching group is 15 years, the mean is 12.08, and the median is 12.00 while in the acupressure group, the maximum age is 14 years, the mean is 12.17, and the median is 12.00.

Table 2: Respondents' Menstrual Cycle, Presence of Stolsel (Blood Clot), Period Length, and Dysmenorrhea Duration

No	Characteristics	Abdominal Stretching Group		Acupressure Group	
		f	%	f	%
1	Menstrual Cycle				
	<21 days	16	22,9	13	18,6
	21-35 days	52	74,3	53	75,7
	>35 days	2	2,9	4	5,7
	Total	70	100,0	70	100,0
2	Period Length				
	1-2 days	1	1,4	0	0
	3-5 days	34	48,6	43	61,4
	6-7 days	26	37,1	24	34,3
	>7 days	9	12,9	3	4,3
2	Stolsel (Blood Clot)				
	Not exist	19	27,1	20	28,6
	Exist	51	72,9	50	71,4

	Total	70	100,0	70	100,0
4	Dysmenorrhea Duration				
	1 day	26	37,1	27	38,6
	2 days	32	45,7	31	44,3
	3 days	10	14,3	11	15,7
	>3 days	2	2,9	1	1,4
	Total	70	100,0	70	100,0

The data in Table 2 shows that mostly the menstrual cycle is 21-35 days (74.3%) in both the abdominal stretching group and the acupressure group (75.7%). Also, the period length is mainly 3-5 days, namely 48.6% in the abdominal stretching group and 61.4% in the acupressure group. In addition, most respondents experienced menstruation with a blood clot or *Stolssel*, which is 72.9% in the abdominal stretching group and 71.4% in the acupressure group. Moreover, dysmenorrhea duration experienced by respondents was mostly 2 days, namely 45.7% in the abdominal stretching group and 44.3% in the acupressure group.

Table 3: Dysmenorrhea Before and After the Therapy

	Group	Min	Max	Mean	Median	Std. Dev
Dysmenorrhea Pretest	Abdominal Stretching	1,00	9,00	4,29	4,00	2,08
	Acupressure	1,00	9,00	3,97	3,00	1,92
Dysmenorrhea Posttest	Abdominal Stretching	0,00	7,00	2,21	2,00	1,82
	Acupressure	0,00	9,00	2,61	2,00	1,76
Decreased Dysmenorrhea	Abdominal Stretching	0,00	7,00	2,07	2,00	1,74
	Acupressure	0,00	6,00	1,36	1,00	1,39

Table 3 points the median of abdominal stretching therapy was higher (4.00) than acupressure therapy regarding menstrual pain before the therapy. Also, menstrual pain after having abdominal stretching therapy decreased by 2 levels, whereas acupressure therapy decreased by 1 level.

Table 4: Data Normality Test

Group		Kolmogorov Smirnov	
		Statistics	<i>p-value</i>
Dysmenorrhea Pretest	Abdominal Stretching	0,203	0,000
	Acupressure	0,222	0,000
Dysmenorrhea Posttest	Abdominal Stretching	0,162	0,000
	Acupressure	0,179	0,000
Decreased Dysmenorrhea	Abdominal Stretching	0,155	0,000
	Acupressure	0,230	0,000

Table 4 shows that the pre-test, post-test, and decreased dysmenorrhea data in the two groups had $p < 0.05$ meaning that the data were not normally distributed. Hence, according to these results, the Wilcoxon and Mann-Whitney non-parametric statistical tests were then conducted.

Table 5: The Difference of Dysmenorrhea Before and After the Applied Therapy to the Abdominal Stretching and Acupressure Group

Group		n	Median	Std. Deviation	Negative Ranks	Ties	Z	<i>p value</i>
Abdominal Stretching	Pretest	70	4,00	3,00	51	17	-6,267	0,000
	Posttest	70	2,00	2,00				
Acupressure	Pretest	70	2,08	1,92	50	20	-6,265	0,000
	Posttest	70	1,82	1,76				

The data in table 5 stated that pre and post dysmenorrhea in the abdominal stretching therapy group showed 51 respondents out of 70 had decreased dysmenorrhea, whereas 17 people remained. Wilcoxon test results obtained $p = 0.000$ so that there is a significant difference in dysmenorrhea before and after abdominal stretching therapy. Besides, 50 respondents in the acupressure group experienced a decrease in dysmenorrhea after doing therapy and 20 people still got dysmenorrhea. The results of the different tests obtained $p = 0.000$ which means there is a significant difference in dysmenorrhea before and after acupressure therapy.

Table 6: The Difference of Primary Dysmenorrhea Between Abdominal Stretching and Acupressure

Group		n	Median	Std. Deviation	Mean Rank	Mann-Whitney U	<i>p</i> value
Pretest	Abdominal Stretching	70	2,00	1,74	73,74	2223	0,335
	Acupressure	70	1,00	1,39	67,26		
Posttest	Abdominal Stretching	70	2,2286	1,81117	65,14	2074,5	0,111
	Acupressure	70	2,6000	1,77258	75,86		
Decreasing	Abdominal Stretching	70	2,0571	1,74361	78,9	1862	0.012
	Acupressure	70	1,3714	1,38492	62,1		

Table 6 indicates that the results of the different tests before the given therapy in the two groups obtained p -value = 0.335 ($p > 0.05$) showing no difference. The analysis of dysmenorrhea differences resulted in no difference after therapy with a p -value = 0.111. Additionally, the difference test between the pre-test and post-test obtained p -value = 0.012 so that there is a significant difference according to these results.

4. Discussion

The age range of respondents is 14-17 years, and most of them are 15 years old, namely 80% in the abdominal stretching group and 74.35% in the acupressure group. The respondents of this research were teenagers. According to WHO, adolescents are residents in the age range of 10 until 19 years old. According to the Regulation of the Minister of Health of the Republic of Indonesia Number 25 of 2014, adolescents are residents in the age range of 10-18 (Pusdatin Kemenkes RI, 2014). The age range of respondents' menarche is 10-15 years and most of whom are 13 years old (30%) in the abdominal stretching group and 12 years old (48.6%) in the acupressure group. Markosyan & Arzumanyan (2017) stated that the average age of menarche was 11.3 ± 0.8 . Also, Martinez (2020) wrote about Trends and Patterns in Menarche in the United States from 1995 to 2013–2017, telling that the mean age of menarche decreased from 1995 (12.1) to 2013–2017 (11.9). In addition, Markosyan & Arzumanyan (2017) found the average age of menarche was 11.3 ± 0.8 years for a total group of 450 girls.

Most of the menstrual cycle in this research is 21-35 days (74.3%) in the abdominal stretching group and 75.7% in the acupressure group. It is a regular menstrual cycle. Saleh, et al. (2016) learnt a menstrual cycle of 24.63 ± 4.26 . This research also showed that most of the period length is 3-5 days, namely 48.6% in the abdominal stretching group and 61.4% in the acupressure group. These data indicate that the duration of menstruation is generally regular. The length of menstruation was 5.71 ± 1.1 8. In addition, the duration of dysmenorrhea experienced by most respondents was two days, namely 45.7% in the abdominal stretching group and 44.3% in the acupressure group.

Pretest and posttest Dysmenorrhea in the abdominal stretching therapy group showed that out of 70 respondents, 51 people had decreased dysmenorrhea and 17 people did not. Also, Wilcoxon test results obtained $p = 0.000$ so that there is a significant difference in dysmenorrhea before and after having abdominal stretching therapy.

According to research conducted by Gamit, et al. (2014), an exercise that is effective in reducing dysmenorrhea is abdominal stretching. It can increase the strength of the abdominal muscles, abdominal flexibility and endurance in certain circumstances, breathing relaxation, release tension and increase pulmonary ventilation so that blood oxygen can decrease the scale of dysmenorrhea. Saleh et al. (2016) found that stretching was effective in reducing primary dysmenorrhea ($P < 0.001$).

For the Acupressure therapy group, 50 respondents experienced a decrease in dysmenorrhea after therapy and 20 of them did not. The results of the different tests obtained $p = 0.000$ indicating that there is a significant difference in dysmenorrhea before and after acupressure therapy. The pressure on acupressure points can affect the production of endorphins in the body. Endorphins are pain killers that the body produces itself. Endorphins are peptide or protein molecules made of a substance called beta lipotropin found in the pituitary gland. Endorphins control the activity of endocrine glands in which these molecules are stored (Kashe, et al. 2010). Gerzson, et al. (2014) found in the literature review that acupressure was effective in reducing dysmenorrhea in addition to pilates and TENS therapy.

The results of the different tests for dysmenorrhea before therapy in both groups obtained p -value = 0.335 ($p > 0.05$) showing no difference. Therefore, it indicates that the condition of dysmenorrhea in both groups is similar. Also, the results of the analysis of differences in dysmenorrhea after therapy obtained $p > 0.05$ meaning there was no difference either. These results indicate that acupressure therapy and abdominal stretching have the same effect to decrease or reduce dysmenorrhea.

The average decrease of dysmenorrhea in abdominal stretching therapy was 2.0571, and it was more than acupressure therapy that was only 1.3714. The difference test on the difference between the pre-test and post-test obtained p -value = 0.012. These results indicate there is a significant difference. Shahr-jerdet al. al (2014) found the same finding that stretching exercises were effective in reducing pain intensity, pain duration, and the number of painkillers used by adolescent girls experiencing primary dysmenorrhea ($p < 0.001$). The results of this study are in line with Carroquino-Garcia et al. (2019) that figured out therapeutic exercise reduced pain intensity in patients with primary dysmenorrhea.

Conclusion

Menstrual pain (dysmenorrhea) on abdominal stretching therapy decreased from an average of 4.2857 on the pre-test to 2.2286 on the posttest. In addition, menstrual pain (dysmenorrhea) in the acupressure therapy group decreased from an average of 3.9714 on the pre-test to 2.6000 on the post-test. Hence, there was a significant difference before and after abdominal stretching therapy ($p = 0.000$) and there was also a significant difference before and after acupressure therapy ($p = 0.000$). Besides, there was no difference before therapy between abdominal stretching therapy and acupressure with a p -value = 0.335. And, there was no difference in dysmenorrhea after therapy between the abdominal stretching and acupressure group ($p = 0.111$). Thus, there was a significant difference in decreasing dysmenorrhea between abdominal stretching therapy and acupressure ($p = 0.012$).

Acknowledgments

We would like to thank Poltekkes Kemenkes Denpasar, Bali for the support during the research. We also thank for the research team for any efforts and technical assistant during all our experimental work.

References

- Barcikowska, Z., Rajkowska-Labon, E., Grzybowska, M. E., Hansdorfer-Korzon, R., & Zorena, K. (2020). Inflammatory Markers in Dysmenorrhea and Therapeutic Options. *International Journal of Environmental Research and Public Health*, 17(1191), 1–14.
- Bustan, M. N., Seweng, A., & Ernawati. (2018). Abdominal Stretching Exercise in Decreasing Pain of Dysmenorrhea Among Nursing Students. In *2nd International Conference on Statistics, Mathematics, Teaching, and Research* (pp. 1–6).

- Carroquino-Garcia, P., Jiménez-Rejano, J. J., Esther Medrano-Sanchez, Casa-Almeida, M. de la, Diaz-Mohedo, E., & Suarez-Serrano, C. (2019). Therapeutic Exercise in the Treatment of Primary Dysmenorrhea: A Systematic Review and Meta-Analysis. *Physical Therapy*, 99(10), 1371–1380.
- Chen, H., & Chen, C. (2004). Effects of acupressure at the Sanyinjiao point on primary dysmenorrhoea. *Journal of Advance Nursing*, 48(4), 380–387.
- Dahlan, M. S. (2019). *Statistik Untuk Kedokteran dan Kesehatan: Deskriptif, Bivariat dan Multivariat* (6th ed.). Jakarta: PT Arkans.
- Gamit, K. S., Sheth, M. S., & Vyas, N. J. (2014). The Effect of Stretching Exercise on Primary Dysmenorrhea in Adult Girls. *International Journal of Medical Science and Public Health*, 3(5), 549–551. <https://doi.org/10.5455/ijmsph.2014.210220142>
- Gerzson, L. R., Padilha, J. F., Braz, M. M., & Gasparetto, A. (2014). Physiotherapy in primary dysmenorrhea : literature review. *Rev Dor. São Paulo*, 15(4), 290–295. <https://doi.org/10.5935/1806-0013.20140063>
- Kashe, F., Ziyadlou, S., Khajehei, M., Reza, A., & Reza, A. (2010). Complementary Therapies in Clinical Practice Effect of acupressure at the Sanyinjiao point on primary dysmenorrhea : A randomized controlled trial. *Complementary Therapies in Clinical Practice* 16, 16, 198–202. <https://doi.org/10.1016/j.ctcp.2010.04.003>
- Markosyan, R., & Arzumanyan, A. (2017). Age of Menarche and Related Factors Endocrinology & Metabolic Syndrome. *Endocrinology & Metabolic Syndrome Markosyan*, 6(5), 11–12. <https://doi.org/10.4172/2161-1017.1000278>
- Martinez, G. M. (2020). Trends and Patterns in Menarche in the United States: 1995 through 2013-2017. *Natl Health Stat Report*, 146(September), 1–12.
- Pusdatin Kemenkes RI. (2014). Adolescent Reproductive Health Situation.
- Ridwan, M., & Herlina. (2015). Metode Akupresur untuk Meredakan Nyeri Haid. *Jurnal Kesehatan Metro Sai Wawai*, VIII(1), 51–56.
- Saleh, H. S., Mowafy, H. E., Azza, A., & Hameid, E. (2016). Journal of Women ' s Health Care Stretching or Core Strengthening Exercises for Managing Primary. *J Women's Health Care*, 5(1), 1–6. <https://doi.org/10.4172/2167-0420.1000295>
- Shady, R. H. A., Seada, A. I. A., & Mostafa, M. F. (2020). Effectiveness of Acupressure in the Reduction of Pain and Anxiety among Patients with Open Thoracotomy. *American Journal of Nursing Research*, 8(February), 182–191. <https://doi.org/10.12691/ajnr-8-2-7>
- Shahr-jerdy, S., Hosseini, R. S., & Gh, M. E. (2014). Effects of stretching exercises on primary dysmenorrhea in adolescent girls. *Biomedical Human Kinetics*, 4(June), 127 – 132. <https://doi.org/10.2478/v10101-012-0024-y>