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THE EFFECT OF ZUMBA ON DYSMENORRHEA IN STUDENTS OF THE FACULTY OF MEDICINE, DIPONEGORO UNIVERSITY

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ABSTRACT

Background: Dysmenorrhea is the most common symptom of most menstrual complaints, and has a greater risk of causing disease than any other gynecological complaints. Dysmenorrhea can be accompanied by other symptoms such as sweating, tachycardia, nausea, vomiting, headache, diarrhea and tremors. Dysmenorrhea causes activity limitations which can affect productivity and quality of life of a woman. **Objectives:** Determine the effects of Zumba on primary dysmenorrhea among female students of the Faculty of Medicine, Diponegoro University. **Method:** This study used an analytic observational study with a pre-middle-posttest design. A participants of 49 students were divided into 2 groups. The control group (K) was not given the Zumba intervention. Treatment group (P) was given 8-weeks intervention program with two 60' sessions per week of Zumba. Data were collected before, during, and after Zumba intervention using a self-administrated dysmenorrhea questionnaire. **Result:** Based on the VAS pain scale and dysmenorrhea questionnaire, the mean value of the control group and treatment group was K: 2.02; 1.92; 2.06; P: 1.98; 1.98; 2.04. Statistical analysis using Friedman tests showed statistically not significant differences ($p > 0.05$). **Conclusion:** Zumba exercise did not have a significant difference in reducing dysmenorrhea pain levels.
Keyword: *Exercise, menstrual pain, primary dysmenorrhea, zumba exercise*

INTRODUCTION

Dysmenorrhea has a significant impact on the limitations of a woman's activity, productivity, and quality of life. Primary dysmenorrhoea is caused by uterine contractions induced by prostaglandin F2α, whereas prostaglandin E inhibits contractions. There is an increase in prostaglandin levels during menstruation in the first 48 hours. This is in line with the onset and magnitude of the intensity of pain. Concomitant symptoms that often occur are nausea, vomiting, headache, or diarrhea which is thought to occur due to entry of prostaglandins into the systemic circulation.[1] Although dysmenorrhoea has a high prevalence, only a few of the patients seek health care from health workers to manage their symptoms.[2]

Sports are now often done as an alternative to using drugs. Sports are known to have the potential to reduce pain and improve the quality of life for dysmenorrhoea patients, one of which is Zumba.[3] Zumba is a fitness dance that combines Latin rhythms with aerobics. Zumba can improve fitness, endurance, and quality of life.[4] In one study, it was found that Zumba can reduce the intensity of pain in the neck and shoulder area after 12 weeks of intervention.[5]

The purpose of this study was to determine the effect of Zumba and primary dysmenorrhoea in students of the Faculty of Medicine, Diponegoro University.

MATERIALS AND METHOD

This research was observational analytic pre-middle-posttest. The sample size is determined by the formula of the samples according to comparative categorical Sopiyudin pairs Dahlan repeated measurements over 2 times the measurement. Obtained 49 subjects were divided into control and treatment groups. Of the 49 subjects, 2 were excluded because did not meet the inclusion criteria for the study. So that the number of subjects in the control group is 24 people and the treatment group is 23 people. Prior to the study, both groups were asked to complete a dysmenorrhoea questionnaire in the beginning, middle and end of the study. The control group was given no intervention Zumba. The treatment group was given Zumba intervention for 8 weeks with a duration of 60 minutes 2 times a week.

The data from the dysmenorrhoea questionnaire pretest, middle test, and post test of the two groups were statistically processed using the Friedman Test to analyze the differences before

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and after the Zumba intervention in the two groups. The degree of significance is if $p \leq 0.05$.

RESULT

Table 1 Characteristics of subjects.

Characteristics of subjects	Mean ± SD	F		%
		P	K	
Age (year)	20,32 ± 0,911			
<20		2	8	21,3
20-30		21	16	78.7
>30		0	0	0
BMI	20,33 ± 2,063			
Menarche				
<8 years		0	0	0
8 – 16 years		23	24	100
>16 years		0	0	0
Menstrual cycle	-			
Every <21 days		1	1	4.3
Every 21 - 35 days		23	24	85.1
Every >35 days		2	3	10.6
Menstrual regularity	-			
Yes		18	20	80,9
No		5	4	19,1
Dysmenorrhea	-			
Yes		21	18	83,0
No		2	6	17,0
Pretest lower abdominal pain level	-			
No pain		2	3	10,6
Mild pain		10	8	38,3
Moderate pain		7	9	34,0
Severe pain		4	4	17,0
Middletest lower abdominal pain level	-			
No pain		1	3	8,5
Mild pain		12	10	46,8
Moderate pain		6	7	27,7
Severe pain		4	4	17,0
Posttest lower abdominal pain level	-			
No pain		1	2	6,4
Mild pain		11	9	42,6
Moderate pain		7	9	34,0
Severe pain		4	4	17,0

Based on table 1, it was found that 83% of the subjects experienced dysmenorrhea. The 17% of the subjects are not experiencing dysmenorrhea.

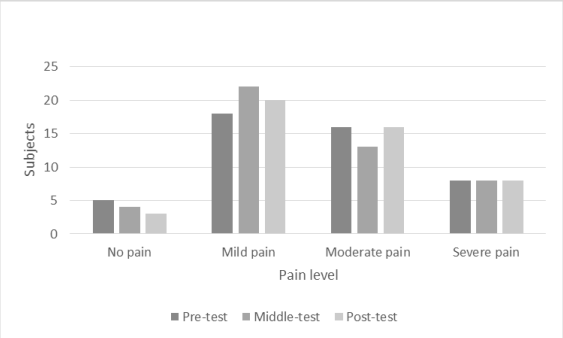

Figure 1 Distribution of menstrual pain level on treatment group subjects.

Based on Figure 1, before being given the Zumba intervention, there were 5 subjects (10.6%) who did not experience lower abdominal pain, 18 subjects (38.3%) experienced mild pain, 16 study subjects (34.0%) experienced moderate pain, and 8 subjects (17.0%) experienced severe pain in the lower abdomen. During the Zumba intervention, 4 subjects (8.5%) did not experience lower abdominal pain, 22 subjects (46.8%) experienced mild pain, 13 subjects (27.7%) experienced moderate pain, and 8 subjects (17.0%) experienced severe pain in the lower abdomen After the Zumba intervention, 3 subjects (6.4%) did not experience lower abdominal pain, 20 subjects (42.6%) experienced mild pain, 16 subjects (34.0%) experienced moderate pain, and 8 subjects (17.0%) experienced severe pain in the lower abdomen.

Table 2 Pain level of menstrual complaints

		N	Mean Rank	Significance (p)
P	*Pre*	23	1,98	
	Middle	23	1,98	0,846
	Post	23	2,04	
K	*Pre*	24	2,02	
	Middle	24	1,92	0,690
	Post	24	2,06	

Based on table 2, it is found that in the treatment group, the highest level of pain was at the time of the post-test measurement. In addition, a significance value (p) of 0.846 > 0.05 was obtained (no significant difference). In the control group, the highest level of pain was found at the

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time of the post-test measurement. In addition, a significance value (p) was obtained of 0.690 > 0.05 (no significant difference).

Table 3 Difference between Friedman test and Wilcoxon test

	Friedman	Wilcoxon		
		Pre – Middle	Middle – Post	Pre - Post
P	0,846	1,000	0,317	0,655
K	0,690	0,564	0,257	0,763

It can be seen in table 3, that the significance value in the Friedman Test in the treatment and control groups >0.05 in other words, the hypothesis is rejected or there is no difference in the level of pain in the treatment group and the control group between the pre-middle-posttest. In the Wilcoxon Test results, the significance value of the two groups in the pre-test, middle-test and post-test measurements was>0.05 in other words, there was no significant difference between the three measurement times.

DISCUSSION

This study showed that there are no significant differences between treatment groups were given a Zumba exercise intervention with the control group which was not given Zumba exercise intervention in the improvement of dysmenorrhea pain level.

These results are consistent with the results of study by Daley that the effect of exercise in reducing primary dysmenorrhoea pain is not proven.[6] Daley also mentioned that exercise was slightly associated with a reduced risk of dysmenorrhoea, which is a potentially effective intervention. Furthermore, it should be realized that pain is subjective relative phenomenon, which may be vulnerable to subjective reporting.[6] The results of this study were also supported by other studies where the pain felt during menstruation did not go away even with exercise.[7]

In this study, Zumba exercise interventions with a duration of 60 minutes 2 times a week for 8 weeks were carried out and the results were not significant. Recommended types of therapeutic exercise in a study is stretching and isometric exercise for 8 weeks to reduce the intensity and duration of pain, yoga for 12 weeks to reduce the intensity of pain and improve quality of life, and aerobics for 12 weeks to improve the quality of life.[8] Research by Barene states that Zumba provides positive results in reducing pain intensity after 12 weeks.[5]

In theory, exercise has an impact on the concentration of progesterone, prostaglandins, and tumor necrosis factor.[9] Other research states that exercise-induced analgesia was instrumental in the release of endogenous opioids that contribute to the modulation of pain.[10] This statement is supported by the results of a systematic review by Santos that during and after exercise, various endogenous systems are activated which stimulate the release of various substances such as neurotransmitters, opioids, serotonin, etc. which modulate pain perception.[11] In addition to analgesia, exercise also plays a role in increasing the levels of the hormone progesterone and affected the decrease of arachidonic acid and prostaglandin production decline resulting in lower incidence of ischemia and hypoxia of the myometrium and reduce pain intensity.[10] Besides exercise, there are other factors that affect the intensity of dysmenorrhea pain, such as stress, hormone activity, hormone intake, and normal BMI.

Stress factors are known to adequately affect the level of dysmenorrhoea pain. When stressed, there is a neuroendocrine response which affects the intensity of dysmenorrhoea pain. *Corticotrophin releasing hormone (CRH) stimulates the production of Adenocorticotrophic hormone (ACTH).* This increases the release of glucocorticoids, especially cortisol which suppresses Gonadotropine Releasing Hormone (GnRH) secretion in the hypothalamus and then inhibits the release of FSH and LH so that follicular development is impaired. The decrease in progesterone levels increases the synthesis of prostaglandins F2α and E2. The excess increase in prostaglandins causes uterine hypercontraction which decreases blood flow to the uterus and causes ischemia thereby increasing the sensitivity of the nerve fibers leading to dysmenorrhea.[12]

A study found that diet or food intake also has an influence on the risk of dysmenorrhoea, especially that foods containing fish, eggs, and fruit have a protective effect against dysmenorrhoea.[13] The protective role obtained from fish is due to the presence of omega-3 fatty acids which play a role

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in the phospholipid structure of the membrane. During menstruation, omega-6 fatty acids stimulate the production of prostaglandins and leukotrienes, which can inhibit the formation of arachidonic acid and reduce myometrial contraction and vasoconstriction.[13]

In this study, normal BMI was one of the inclusion criteria. Dysmenorrhoea is known to occur more frequently in women with abnormally large body mass and body mass fluctuations. In the study by Zurawiecka, there was a relationship between the amount of adipose tissue in the central or abdominal area with dysmenorrhoea.[14]

Until further research is available, the authors cannot rule out the possibility that exercise worsens primary dysmenorrhoea symptoms. Apart from stress factors, diet intake, BMI, family history, presence of Premestrual Syndrome (PMS), earlier age of menarche, frequency of exercise, and several other factors, exercise is thought to increase somatic awareness by increasing sensitivity to body conditions that produce symptom levels, which is higher in women who exercise compared to those who do not have much activity. In addition, there is consideration for the idea that dysmenorrhoeic women may lack motivation to be active when experiencing menstrual pain.[6]

CONCLUSION

Zumba exercises for 8 weeks with a duration of 60 minutes 2 times a week did not have a statistically significant impact on reducing the intensity of dysmenorrhoea pain.

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