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-administered 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 dysmenorrhea 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. Although dysmenorrhea has a high prevalence, only a few of the patients seek health care from health workers to manage their symptoms.

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 dysmenorrhea patients, one of which is Zumba. Zumba is a fitness dance that combines Latin rhythms with aerobics. Zumba can improve fitness, endurance, and quality of life. 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.

The purpose of this study was to determine the effect of Zumba and primary dysmenorrhea 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 dysmenorrhea 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 dysmenorrhea questionnaire pretest, middle test, and post test of the two groups were statistically processed using the Friedman Test to analyze the differences before
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.

<table>
<thead>
<tr>
<th>Characteristics of subjects</th>
<th>Mean ± SD</th>
<th>F</th>
<th>P</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year)</td>
<td>20.32 ± 0.911</td>
<td>2</td>
<td>8</td>
<td>21.3</td>
</tr>
<tr>
<td>&lt;20</td>
<td>21</td>
<td>16</td>
<td>78.7</td>
<td></td>
</tr>
<tr>
<td>20-30</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>&gt;30</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>BMI</td>
<td>20.33 ± 2.063</td>
<td>1</td>
<td>1</td>
<td>4.3</td>
</tr>
<tr>
<td>&lt;8 years</td>
<td>23</td>
<td>24</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>&gt;8 years</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Menarche</td>
<td>23</td>
<td>24</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>&lt;8 years</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>&gt;8 years</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Menstrual cycle</td>
<td>23</td>
<td>24</td>
<td>85.1</td>
<td></td>
</tr>
<tr>
<td>Every &lt;21 days</td>
<td>1</td>
<td>1</td>
<td>4.3</td>
<td></td>
</tr>
<tr>
<td>Every 21-35 days</td>
<td>23</td>
<td>24</td>
<td>85.1</td>
<td></td>
</tr>
<tr>
<td>Every &gt;35 days</td>
<td>2</td>
<td>3</td>
<td>10.6</td>
<td></td>
</tr>
<tr>
<td>Menstrual regularity</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>18</td>
<td>20</td>
<td>80.9</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>5</td>
<td>4</td>
<td>19.1</td>
<td></td>
</tr>
<tr>
<td>Dysmenorrhea</td>
<td>23</td>
<td>24</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>21</td>
<td>18</td>
<td>83.0</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>6</td>
<td>17.0</td>
<td></td>
</tr>
<tr>
<td>Pretest lower abdominal pain</td>
<td>24</td>
<td>25</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>No pain</td>
<td>2</td>
<td>3</td>
<td>10.6</td>
<td></td>
</tr>
<tr>
<td>Mild pain</td>
<td>10</td>
<td>8</td>
<td>38.3</td>
<td></td>
</tr>
<tr>
<td>Moderate pain</td>
<td>7</td>
<td>9</td>
<td>34.0</td>
<td></td>
</tr>
<tr>
<td>Severe pain</td>
<td>4</td>
<td>4</td>
<td>17.0</td>
<td></td>
</tr>
<tr>
<td>Middletest lower abdominal</td>
<td>24</td>
<td>25</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>No pain</td>
<td>1</td>
<td>3</td>
<td>8.5</td>
<td></td>
</tr>
<tr>
<td>Mild pain</td>
<td>12</td>
<td>10</td>
<td>46.8</td>
<td></td>
</tr>
<tr>
<td>Moderate pain</td>
<td>6</td>
<td>7</td>
<td>27.7</td>
<td></td>
</tr>
<tr>
<td>Severe pain</td>
<td>4</td>
<td>4</td>
<td>17.0</td>
<td></td>
</tr>
<tr>
<td>Posttest lower abdominal</td>
<td>24</td>
<td>25</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>No pain</td>
<td>1</td>
<td>2</td>
<td>6.4</td>
<td></td>
</tr>
<tr>
<td>Mild pain</td>
<td>11</td>
<td>9</td>
<td>42.6</td>
<td></td>
</tr>
<tr>
<td>Moderate pain</td>
<td>7</td>
<td>9</td>
<td>34.0</td>
<td></td>
</tr>
<tr>
<td>Severe pain</td>
<td>4</td>
<td>4</td>
<td>17.0</td>
<td></td>
</tr>
</tbody>
</table>

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](image)

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

<table>
<thead>
<tr>
<th>N</th>
<th>Mean Rank</th>
<th>Significance (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>Pre</td>
<td>23 1.98</td>
</tr>
<tr>
<td></td>
<td>Middle</td>
<td>23 1.98</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>23 2.04</td>
</tr>
<tr>
<td>K</td>
<td>Pre</td>
<td>24 2.02</td>
</tr>
<tr>
<td></td>
<td>Middle</td>
<td>24 1.92</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>24 2.06</td>
</tr>
</tbody>
</table>

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
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

<table>
<thead>
<tr>
<th></th>
<th>Friedman</th>
<th>Wilcoxon</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre - Middle</td>
<td>Middle - Post</td>
</tr>
<tr>
<td>P</td>
<td>0.846</td>
<td>1.000</td>
</tr>
<tr>
<td>K</td>
<td>0.690</td>
<td>0.564</td>
</tr>
</tbody>
</table>

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-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. 5
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. 9

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
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. Dysmenorrhea 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 dysmenorrhea.14

Until further research is available, the authors cannot rule out the possibility that exercise worsens primary dysmenorrhea symptoms. Apart from stress factors, diet intake, BMI, family history, presence of Premenstrual 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 dysmenorrheic 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 dysmenorrhea pain.

REFERENCES


