Dysmenorrhea, commonly referred to as menstrual cramps, is defined as cyclic pain directly related to menstruation. The pain begins just prior to or with the onset of menstrual flow and resolves with menstruation. The pain may be experienced in the pelvis, lower back, or upper legs. Primary dysmenorrhea usually begins within the first six months after menarche, once ovulatory cycles are established. Estimates of the proportion of women who experience dysmenorrhea range widely from 25% of all women up to 90% in adolescents. The cause of pain at, or around, the time of menses is believed to be due to the production of prostaglandins in the endometrium in an ovulatory cycle. Prostaglandins cause uterine contractions, which result in the expulsion of sloughed endometrial lining.

Nonsteroidal anti-inflammatory drugs (NSAIDs) are the best-established initial therapy for dysmenorrhea. These drugs are particularly useful due to their ability to decrease the production of prostaglandins, believed to be a primary cause uterine contraction and resulting pain.

Several other hormonal methods exist for treating dysmenorrhea: oral contraceptive pills, Depo-Provera, Mirena (Levonorgestrel intrauterine device). The proposed mechanism of action is reduced prostaglandin release during menstruation.

Few studies have examined the effect of lifestyle modifications on the management of dysmenorrhea.

Complementary and alternative medicine treatments for dysmenorrhea that have been studied include transcutaneous electrical nerve stimulation, acupuncture, acupressure, spinal manipulation, behavioral interventions, relaxation, herbal and dietary therapies.

Several sources in the popular media claim to have yoga poses for managing menstrual discomfort.

Yoga combines physical exercises, mental meditation, and breathing techniques to strengthen the muscles and relieve stress. Therefore, yoga can help mind and body adapt with stress, anxiety and depression making the person feel relaxed and calm. Yoga has been used to alleviate problems associated with high blood pressure, high cholesterol, migraine headaches, asthma, shallow breathing, backaches, diabetes, menopause, multiple sclerosis, varicose veins, and chronic illnesses. Yoga seems to be an effective treatment for primary dysmenorrhea.

As yet, we have found no publication of randomized trials of the effect of yoga on primary dysmenorrhea. It is important that medical professionals be aware of the manner in which adolescents cope with their menstrual pain because such methods may potentially be harmful or generally ineffective. Hence, it is the goal of the present

Original Study

Effect of Three Yoga Poses (Cobra, Cat and Fish Poses) in Women with Primary Dysmenorrhea: A Randomized Clinical Trial

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ABSTRACT

Objective: We have evaluated the clinical efficacy of yoga for primary dysmenorrhea. Primary dysmenorrhea occurs in 50% of female adolescents and is a common problem in women of reproductive age. We have assessed whether three yoga poses (Cobra, Cat, and Fish Poses) are able to reduce severity and duration of primary dysmenorrhea.

Methods: To determine the effectiveness of yoga on adolescents with primary dysmenorrhea, 92 girl students, 18–22 years old, were randomly assigned to an experimental group (n = 50) and a control group (n = 42). The Visual Analog Scale for Pain was used to assess intensity of pain and the pain duration was calculated in terms of hours. Each group was evaluated for three menstrual cycles. At first cycle no method was presented; the participants only were asked to complete the questionnaire of menstrual characteristics during their menstrual. Then the participants were asked to do yoga poses at the onset of menstruation. The control group did not receive any intervention except to complete menstrual characteristics questionnaire in during of menstruation. The control group did not receive any intervention except to complete menstrual characteristics questionnaire in during of menstruation.

Results: There was a significant difference in the pain intensity and pain duration in the post-tests compared with the pretest in yoga group (P < 0.05). The results showed that compared with the Control group, there was a significant difference in the pain intensity and pain duration in the experimental group (P < 0.05).

Conclusion: Yoga reduced the severity and duration of primary dysmenorrhea. The findings suggest that yoga poses are safe and simple treatment for primary dysmenorrhea.

Key Words: Complementary therapies, Menstruation, Pain, Primary dysmenorrhea, Yoga

Introduction

Dysmenorrhea, commonly referred to as menstrual cramps, is defined as cyclic pain directly related to menstruation. The pain begins just prior to or with the onset of menstrual flow and resolves with menstruation. The pain may be experienced in the pelvis, lower back, or upper legs. Primary dysmenorrhea usually begins within the first six months after menarche, once ovulatory cycles are established. Estimates of the proportion of women who experience dysmenorrhea range widely from 25% of all women up to 90% in adolescents. The cause of pain at, or around, the time of menses is believed to be due to the production of prostaglandins in the endometrium in an ovulatory cycle. Prostaglandins cause uterine contractions, which result in the expulsion of sloughed endometrial lining.

Nonsteroidal anti-inflammatory drugs (NSAIDs) are the best-established initial therapy for dysmenorrhea. These drugs are particularly useful due to their ability to decrease the production of prostaglandins, believed to be a primary cause uterine contraction and resulting pain.

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As yet, we have found no publication of randomized trials of the effect of yoga on primary dysmenorrhea. It is important that medical professionals be aware of the manner in which adolescents cope with their menstrual pain because such methods may potentially be harmful or generally ineffective. Hence, it is the goal of the present
study to gain a better understanding of the effectiveness of yoga in the management of menstrual pain in a sample of adolescents.

**Methods**

**Participants**

To do this study, 450 girl students, 18–22 years old, with primary dysmenorrhea were selected through interview from the north of Iran, in the Islamic Azad University branch of Rasht. Primary dysmenorrhea is defined as cramping pain in the lower abdomen occurring at the onset of menstruation in the absence of any identifiable pelvic disease.

The students in two faculties were randomly assigned into control and experimental groups; this cluster randomization was used to reduce the possibility of contamination between two groups.

Then, a questionnaire was given which included information about the age of onset of the menses, the interval of menstrual cycle, the age of onset of any primary dysmenorrhea, the frequency and intensity of pain during menstruation, and other pelvic discomforts.
dysmenorrhea, duration of any pain, the severity of any pain, and any treatment interventions which successfully alleviate the pain. Inclusion criteria were: being single, having regular menstrual cycles, with no medical history of other gynecological diseases, having moderate to severe pain intensity, varying from 0 to 3 on the Visual Analog Scale for Pain (VASP) of Andersch and Milsom; absence of hormonal treatment and nonpharmacologic methods before menstruation. Finally, 120 girl students were included in the study.

The Visual Analog Scale for Pain is categorized in four grades. When the patient had ‘no pain’ it was scaled as ‘0’, ‘mild’ and tolerable pain as ‘1’, ‘moderate and seriously disturbing’ pain as ‘2’ and ‘severe and unbearable’ pain as ‘3’.

**Intervention**

Participants in the experimental group were asked to perform yoga movements (Cobra, Cat and Fish poses) for at least 14 days of menstrual cycle (luteal phase) and for one 20-minute session in a day, in the morning before breakfast or before lunch or at night before dinner (at least 3 hours after ordinary meal, or 2 hours after a light meal) together with start long breath during movements.

Each of the participants in the experimental group received a booklet with level to level explanations along with movements and breathing. The booklet that described the yoga movements was designed specifically for this study. Yoga is usually better learned from a yoga teacher, but yoga is simple enough that one can learn the basics from good books on the subject, which are plentiful. Figure 1 shows the three yoga poses and the special manner for performing them.

The control group did not receive any intervention and only completed the questionnaire of menstrual characteristics for collecting the final data.

**Procedure**

The two faculties were randomly assigned to an experimental or a control group. Potential subjects at each faculty were selected by simple, random sampling from students who had dysmenorrhea pain scoring in 2 and 3 (moderate and severe) on the VASP.

Each group was evaluated for three menstrual cycles. At first cycle no method was presented, the participants only completed the questionnaire of menstrual characteristics (including pain intensity, pain duration, etc) during their menstrual, so that they could calculate pain duration from beginning up to the end in terms of hours and the intensity of pain was based on Visual Analog Scale. Then, the participants in the experimental group at luteal phase of the second and third menstrual cycles were treated by yoga poses and were asked to complete the menstrual characteristics questionnaire in during of menstruation.

Participants in the control group were asked to complete the menstrual characteristics questionnaire in during of menstruation.

**Data Analysis**

Finally, information about 50 experimental subject, and 42 control subjects (92 participants) were analyzed by SPSS. Statistical tests were performed by SPSS consisting t test, Mann-Whitney test and Friedman test. A value of $P < 0.05$ was considered significantly different.

**Results**

Of the 120 cases with primary dysmenorrhea who met inclusion criteria, 28 participants did not complete the study because they had an irregular course of menstruation and failed to comply.

Therefore, statistical analysis was done on 50 participants in experimental (yoga) group and 42 participants in control group.

As shown in Table 1, the mean age for the experimental group was 20.86 and for the control group was 20.45. These mean ages are no significantly different ($P = 0.138$). Also, no significant differences between two groups were in menarche age ($P = 0.303$) and age of dysmenorrhea ($P = 0.568$). There were no significant differences in pain duration of the experimental and control groups using the t test ($P = 0.471$).

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Comparison of the Means and Standard Deviation for Pain Intensity and Pain Duration (hours) in the Experimental (Yoga) Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variables</td>
<td>Experimental (Yoga) (n = 50)</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>20.86 (mean)</td>
</tr>
<tr>
<td><strong>Menarche Age</strong></td>
<td>13.2 (mean)</td>
</tr>
<tr>
<td><strong>Dysmenorrhea Age</strong></td>
<td>15.5 (mean)</td>
</tr>
<tr>
<td><strong>Pain Duration</strong></td>
<td>37.49 (mean)</td>
</tr>
<tr>
<td><strong>Pain Intensity</strong></td>
<td>2.51 (mean)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Comparison of the Means and Standard Deviation for Pain Intensity and Pain Duration (hours) in the Control Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variables</td>
<td>Control (n = 42)</td>
</tr>
<tr>
<td><strong>Pain Intensity Pretest</strong></td>
<td>2.54 (mean)</td>
</tr>
<tr>
<td>1 Month Post-test</td>
<td>1.50 (mean)</td>
</tr>
<tr>
<td>2 Month Post-test</td>
<td>1.26 (mean)</td>
</tr>
<tr>
<td><strong>Pain Duration Pretest</strong></td>
<td>37.5 (mean)</td>
</tr>
<tr>
<td>1 Month Post-test</td>
<td>32.1 (mean)</td>
</tr>
<tr>
<td>2 Month Post-test</td>
<td>33.0 (mean)</td>
</tr>
</tbody>
</table>
The mean of pain duration before doing yoga was 37.49 hours in the experimental group and 40.57 hours in the control group.

Also, there were no significant differences in pain intensity average of the experimental and control groups with using Mann-Whitney test before interference ($P = 0.81$). Therefore, the participants entered the study with moderate and severe pain.

Table 2 presents a comparison of the means, standard deviation for pain intensity, and pain duration in the experimental group.

The post-tests at one month and two months were compared with the pretest. There were significant differences in pain intensity with using Friedman test and in pain duration using with repeated measure ANOVA test in the two post-tests compared with the pretest ($P = 0.000$). This means that intensity and duration of dysmenorrhea had been reduced after doing yoga. Also, after doing yoga in second month, pain intensity and pain duration reduced more with comparison to the first month. But according to Table 3, there was no significant difference in the control group in the post-test compared to the pretest.

Table 4 shows a comparison of the means and standard deviations for pain intensity and pain duration between the experimental and control groups. A significant difference was observed between experimental and control groups in pain intensity and pain duration with using Mann-Whitney test.

### Discussion and Conclusions

The results of this randomized trial suggest that yoga poses (Cobra, Cat and Fish poses) can be an effective non-pharmacologic alternative for adolescents with primary dysmenorrhea.

In our study, three yoga poses were performed at luteal phase of menstrual cycle for one 20 minutes session in a day. The yoga poses that seem are suitable for relieving menstrual pain include: Kapalabhati, Easy pose (Sukhasana), Bow pose (Dhanurasaana), Wind Relieving pose (Pavanamuktasana), Cobra pose (Bhuganagasana), Cat pose (Bidalasana), Fish pose(Matsyasana), Anuloma Viloma, Relaxation pose. We selected three of the poses because the cobra pose improves spinal flexibility and strengthens the muscles in back, the cat pose initiates movement from center and coordinates movement and breath, and the fish pose relieves stiffness of the neck and shoulder muscles and improves flexibility of spine. Our study showed three yoga poses to be an effective treatment, but the mechanism behind yoga effectiveness for dysmenorrhea is still unclear.

According to medical theory pain can be diagrammed as a spiral: pain → tension → fear → pain. The relaxation part of the therapy influences the tension, while the suggestions influence the fear. Yoga is believed to reduce pain by helping the brain’s pain center to regulate the gate-controlling mechanism located in the spinal cord and the secretion of natural painkillers in the body. Breathing exercises used in yoga can also reduce pain. Because exhalation can help produce relaxation and reduce tension, awareness of breathing helps to achieve calmer, slower respiration and aid in relaxation and pain management.

Also, according to Chinese medical theory, Liver-Qi stagnation causes women’s blood to stagnate in the uterus, leading to periods of pain. Within this theory, a possible explanation is that yoga promotes relaxation, reduces stress, and increases circulation. By the year 2002, yoga had been increasingly recommended for dysmenorrhea, premenstrual syndrome, and other disorders in premenopausal women, in Europe as well as in the United States.

Therefore, yoga performs as part of an exercise program to increase general health, to reduce stress, to improve flexibility, to strengthen muscle, and to alleviate certain physical symptoms, such as chronic pain.

Growing interest in alternative and complementary medicine has increased the popularity of yoga in world and its medical benefits. This study contributes to the development of knowledge in nursing and midwifery about how female adolescents with dysmenorrhea can manage themselves.

The obtained data is based on female adolescent participants’ responses, which is the limitation of the study.

Finally, the comparison of yoga with NSAIDs on primary dysmenorrhea, the effect of others yoga poses on primary dysmenorrhea and also the amount of time doing yoga with the correlation of pain relief can be suggested for future study.

### Acknowledgments

We thank our subjects for participating in the study.

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