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Effect of Stretching Exercise on Primary Dysmenorrhea in Adolescent Girl: An Interventional Study

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Abstract: ***Study aim: To assess the effect of one term of stretching exercise on primary dysmenorrhea in high school students. Material and methods: 60 single girls aged 18-22 years with moderate-to-severe primary dysmenorrhea are select from school of physiotherapy R K University. The students are non-athletes and volunteered for the study. The participants are randomly divided into 2 groups: an experimental group (n = 30) and a control group (n = 30).In the intervention group, the subjects are requested to complete an active stretching exercise for 8 weeks (3 days per week, 2 times per day, 10 minutes each time) at home. In the pre-test, all of subjects were examined for pain intensity (10-point scale), pain duration, and the use of sedative tablets in 2 continuous menstruation cycles. The post test was examined 8 weeks later. Results: After 8 weeks, pain intensity is reduced from 7.65 to 4.88, pain duration is decreased from 7.48 to 3.86 hours, and use of sedative tablets is decreased from 1.65 to 0.79 tablets in the experimental group (p<0.05). In the control group, a significant decline is only noted for pain duration (p<0.001). Conclusions: Stretching exercises are effective in reducing pain intensity, pain duration, and the amount of painkillers used by girls with primary dysmenorrhea***

Keywords: Primary Dysmenorrhea, Stretching Exercise, Adolescent girl

1. Introduction

Primary dysmenorrhea is a difficult menstrual flow in the absence of any pelvic pathology. It is the most common gynaecologic problem among adolescent females [1,2,3,4,5]. Incidence of primary dysmenorrhea was reported to be between 50% and 90% in different societies [6,7,5,8]; its incidence in Iran has been estimated to be between 74% and 84.1% [4,9,10] It is characterized by lower abdominal pain that potentially could radiate to the back and thigh regions. The pain may be associated with headache, fatigue, nervousness, nausea, vomiting, mood swings, and (rarely) in severe cases syncope [5]. Primary dysmenorrhea reportedly stops spontaneously after 1-3 years; however, sometimes it is possible to continue until childbirth [11,6,12].

The idea that various type of active or passive exercise might help in alleviating pain in primary dysmenorrhea is not a new issue. It is widely thought that exercise reduces the frequency and / or the severity of dysmenorrhea syndrome. Suggestions for primary dysmenorrhea, such the use of stretching exercises [1], sports and regular exercise, are considered to be effective procedures in the prevention and treatment of primary dysmenorrhea. Generally, it seems that exercise therapy may alleviate discomfort associated with dysmenorrhea; however, scientific articles in this area are controversial [13]. The results of various studies have shown that with sport activity, the intensity of symptoms and pain has decreased [14] Yet at the same time, the frequency of dysmenorrhea in high school girls who were actively involved in sports activities was considerably less than the compared group [15] Women that participated in heavy sports, as compared with those who occasionally took part in sports, experienced fewer occurrences of symptoms of dysmenorrhea [16]. In some published articles, no correlation was found between physical activity level and dysmenorrhea [17,18,19] Moreover, after checking with depression and mood swings, they found that sport in some women induce higher levels of symptoms along with menstruation [20]

Several studies have shown that the reduction of dysmenorrhea in women who regularly exercise may be due to effects of hormonal changes on uterine epithelial tissues or an increase in endorphin levels. It appears that exercise has analgesic effects that act in a non-specific way [21,22] Research in the general population has shown that regular exercise can alleviate some types of symptoms including mood transitions, fatigue and abdominal bloating in females with primary dysmenorrhea, but these data are usually empirical and anecdotal rather than evidence based. Results have shown that women who took part in regular, moderate, aerobic exercise had fewer negative effects, such as impaired concentration, pain and behavioral changes, than non-exercisers during period cycles.

2. Need of the Study

Primary dysmenorrhea is considered the leading cause of absenteeism from work in young girls. So it seems that this complication is a general problem in young girls, and developing conservative methods to reduce its complications is completely necessary. Since researches have shown contradictory results about the role of exercise therapy in treatment of primary dysmenorrhea there is need for new research about this connection. It was believed that

contracted ligamentous bands in the abdominal region were the causative factor for physical compression of nerve pathways and their irritation, so the proposed series of stretching exercise was considered very effective. This study was designed to determine the value of stretching exercises in reducing the signs and symptoms of dysmenorrhea in student-aged girls.

Aim

To study various type of stretching exercise might help in alleviating pain in primary dysmenorrhea.

Objective

1) To compare the intensity of pain and discomfort between experimental group and control group.
2) To check the effectiveness of stretching exercise for alleviating pain score and quality of life score in both groups after intervention.

Hypothesis

1) **Null hypothesis**: there is no significant difference in pain experience by girls between control group and experimental group.
2) **Alternate hypothesis**: There is significant difference in pain experience by girls between experimental group and control group**.**

3. Review of Literature

1) Sara Azima1, Hajar Rajaei Bakhshayesh2, Keramatollah Abbasnia3, Maasumeh Kaviani1, Mehrab Sayadi was studies that Effect of Isometric Exercises on Primary Dysmenorrhea: A Randomized Controlled Clinical Trial. This study was results that **i**sometric exercises seem to be an easy, non-pharmacological method for reducing primary dysmenorrheal. (2015)
2) Farideh Vaziri · Azam Hoseini · Farahnaz Kamali · Khadijeh Abdali · Mohamadjavad Hadianfard · Mehrab Sayadi was studied Comparing the Effects of Aerobic and Stretching Exercises on the Intensity of Primary Dysmenorrhea in the Students of Universities of Bushehr. This study was concluded that a significant difference was observed between the aerobic group and the control group as well as between the stretching group and the control group. Within group comparisons showed a significant difference in the aerobic and the stretching group before and after the interventions. However, no such difference was observed in control group. Both aerobic and stretching exercises were effective in reducing the severity of dysmenorrhea. (2015)
3) Ruth W. Harris[a] & C. Etta Walters was studied the effect of Prescribed Abdominal Exercises on Dysmenorrhea in College Women. This study was concluded that through an abdominal exercise program there is an increase in abdominal strength and endurance which is significant at the .01 per cent level of confidence and that approximately 87 per cent of those showing improvement in abdominal strength and endurance showed a decrease in one or more factors indicative of the severity of dysmenorrhea. (17 March 2013)

4. Methodology

Study Type: Interventional Study
Study Setting: R K University
Study Population: Girls suffering from Primary Dysmenorrhea
Sample Size: 60
Sampling Technique: Purposive Sampling
Study Duration: 6 Months

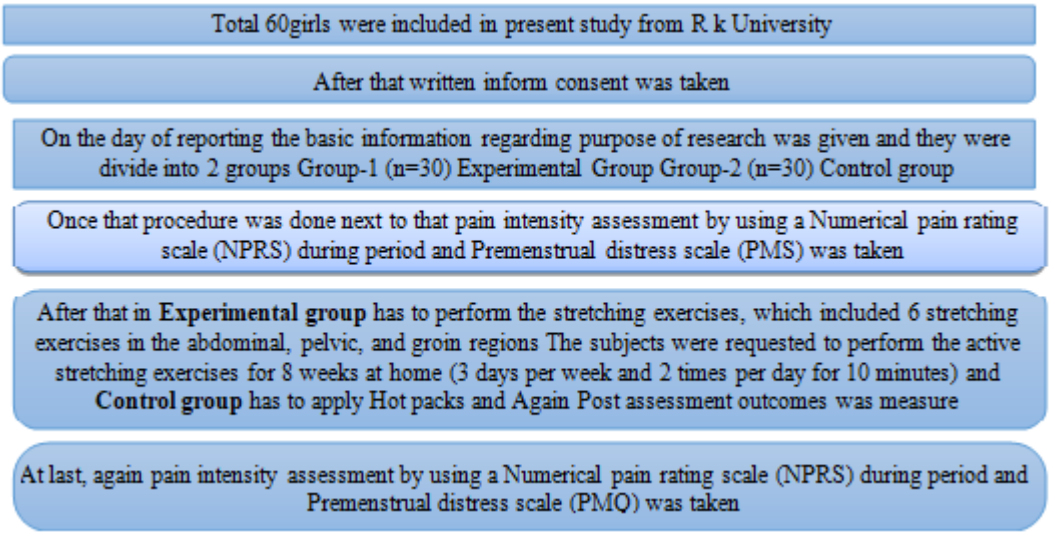
Inclusion Criteria:-

- **AGE:** 18 to 24 year
- **NPRS:** More than 4
- No history of hospitalization within 6 month

Exclusion Criteria

- **NPRS:** Less than 4
- History of hospitalization within 6month
- Will not interested
- on operative subject

Method



Prescribe Exercise:
In the first stretching exercise, the subject will be asked to stand behind a chair, bend trunk forward from the hip joint so that the shoulders and back will positioned on a straight line and the upper body will have placed parallel to the floor Duration of holding time will be 5 seconds; repetition will be 10 times.

In the second stretching exercise, the subject will have requested to stand 10-20 cm behind a chair, then raise 1 heel off the floor, then repeat the exercise with the other heel alternatively The exercise will be performed 20 times.

In the third exercise, the subject will have asked to spread their feet shoulder width, place trunk and hands in forward stretching mode, then completely bend her knees and maintain a squatting position Duration of this position will be 5 seconds; the subject then raised her body and repeated the same movement 10 times.

In the fourth exercise, the subject will have asked to spread her feet wider than shoulder width. Then the subject will have asked to bend and touch left ankle with her right hand while putting her left hand in a stretched position above her head, so that the head will in the middle and her head will have turned and looked for her left hand. This exercise will have repeated for the opposite foot with the same method. The exercise was repeated alternatively 10 times for each side of the body.

In the fifth exercise, the subject will asked to lie down in the supine position so that the shoulders, back, and feet will kept on the floor. In this position the knees will bent with the help of her hands and reached to her chin The repetition frequency will be 10 times.

In the sixth and last exercise, the subject will asked to stand against a wall and put her hands behind her head and elbows pointed forward in the direction of the eyes then without bending the vertebral column, the abdominal muscle wall will be contracted for 10 seconds. This exercise will be repeated 10 times.

Material Used:
1) Pen/pencil
2) Laptop (Acer)

5. Results

Data was collected on a data sheet and encoded for computerized analysis.

The majority (49.2%) of girls from both the experimental and control group reported pain in the abdomen and low back area, about 30.2% of students irrespective of group experienced pain in the suprapubic, low back, and in the buttocks, 14.5 % reported pain in suprapubic area and 6.1 experienced low back pain. These symptoms were not evaluated following an intervention procedure. The average menstrual cycle length during the study period in the subjects was 6 days in both experimental and control group. Fifty-nine percent of subjects had regular menstrual periods; no significant between-group differences were found in this regard. Of the participants, 38.0% occasionally had regular exercises (regular exercise will defined as an exercise which performed 3 times a week 30-45 minutes); 61.3% of students from the experimental group, and 30.1% from the control group ($p<0.001$) never had any regular exercise; 3.2% and 25.5% respectively ($p<0.001$) reported mostly performing regular exercise.

Intra Group Analyses of Experimental group

Outcomes	PRE ±SD	POST ±SD	t- Value	Sig 2 tailed (p value)
NPRS	6.49	10.93	-11.22	0
PMS	3.28	3.8	-21.76	0

Intra Group Analyses of Control group

Outcomes	PRE ±SD	POST ±SD	t- Value	Sig 2 tailed (p value)
NPRS	4.25	9.99	-9.002	0.001
PMS	3.22	3.99	-18.91	0

Intergroup Analysis by Unpaired t-test

Outcomes	Position - A SD	Position - B SD	't' Value	'p' Value
NPRS	7.67	8.52	0.817	0.003
PMS	2.14	1.88	3.352	0.001

The descriptive statistics for pain intensity, pain duration recorded in both groups before and after completion of the experiment are presented in Table 1. It was found that following the intervention pain intensity, pain duration, decreased significantly ($p<0.001$) in the experimental group, while in the control group a significant decline will only note for pain duration ($p<0.001$). Hence, after intervention the mean values for estimated pain intensity will in the control group 2.3 pts higher ($p<0.001$), experienced pain duration will by more than 1 hour longer compared to the experimental group. the level of discomfort due to dysmenorrhea was accompanied by intensity of physical activity.

6. Discussion

Findings of different studies have shown that therapeutic exercise and physical activity will related with reduced incidence of dysmenorrhea, whereas in some of studies did not demonstrate such a correlation statistically [26]. Results of Israel *et al.* [14] showed that after 12 weeks of aerobic training, the intensity of symptoms decreased. Golub *et al.* [15] expressed that dysmenorrhea in high school girls who were involved in sports and physical activities will less than non-exerciser group. According to Izzo and Labriola [16], women involved in heavy sport activities experienced fewer signs and symptoms of dysmenorrhea in comparison with women who had occasional sport practice. In a few articles, no correlation between levels of physical activity and dysmenorrhea-related symptoms was found [17, 18, 19]. Perceived stress is considered to be a critical element in the relationship between exercise and treatment of dysmenorrhea. There are several studies that have shown considerable correlation between tensional stress in life and premenstrual symptoms [20]. Physiologic mechanisms through which exercise might improve symptoms resulting from the menstrual cycle are not clear. However, some

hypotheses are being proposed for its explanation. Izzo and Labriola [16] proposed that the increase in the blood flow and metabolism of the uterus during exercise may be effective in the reduction of dysmenorrheal symptoms. In another words, improved metabolism is a factor in the reduction of symptoms. It is also suggested that increased menstrual pain by uterine muscle contraction is derived from a nervous system that is innervated by the sympathetic nerve Hence, stress through hyperactivity of sympathetic nerve system via the increase contractibility of uterine muscles may lead to menstruation symptoms. Consequently, it might be possible to reduce dysmenorrhoeal symptoms by decreased sympathetic over-activity through exercise. Another hypothesis suggests that therapeutic exercise can increase the secretion of endorphins from the brain, and these materials in turn raise the pain threshold of the body [24].

It has been suggested that therapeutic exercise is helpful for the treatment of primary dysmenorrhea through various modes such as decrease stress, attenuate menstrual symptoms through increase of local metabolism, and increase local blood flow at the pelvic level and increase of endorphin production. It is a multidimensional problem and has various aspects that are a combination of organic, psychological, and sociocultural factors that result in its symptoms. However, findings of current research illustrate that exercise may have a key role in alleviating these problems. Age was an important element in the intensity of perceiving menstrual changes. With increasing age, decreases in pain level, negative states, impaired concentration, and behaviour swings have been reported [23]. The findings of this study illustrate that girls with primary dysmenorrhea report less pain than the non-exercising group, which is in accord with Aganoff *et al.* [23]. However, the results contradict the findings of Metheny and Smith [20] who reported higher levels pain and negative moods with performing regular exercise in dysmenorrhoeal girls. .

Exercise in various forms including stretching, aerobic exercise, free exercise, or competitive athletic performance has been believed to improve or even completely resolve primary dysmenorrhea for half a century. Studies were performed to prove the presence of such a relationship; however, each one had methodological handicaps and researchers were led to contradictory results, so there is a need to do more research. In particular, blind studies are needed to eliminate the psychological effects of exercise from its physical effects. The type and level of physical activity and frequency of movement was under control for every subject in the present study. However, as the nature of this research suggests, it is not possible to control this factor entirely. It is also suggested that further research be conducted in different age groups and in different treatment regimens.

Summing up, the findings of this study suggest that there is a beneficial impact of physical exercise on menstrual cycle symptoms. Whether or not the effects of exercise could be long-term should be the subjects of further research. According to the results of this study, performing 8 weeks of selected stretching exercises reduces pain intensity, diminishes pain duration, and decreases the consumption of analgesics drugs in students with moderate- to-severe primary dysmenorrhea during the menstruation cycle.

7. Limitations of the study

A certain limitation of this study is the cross-sectional nature of the research, as it does not reflect any temporal changes. Furthermore, the study was performed on a relatively small sample; therefore, generalizations of results in terms of the entire female population thought to be made with caution.

8. Further Recommendation

Furthermore, future research should be done in such a way that take into account the measurement of psychosocial and stress variables, until findings derived from a study purely demonstrate the role and effects of stretching on primary dysmenorrhea.

9. Conclusion

There is significant difference in pain experience by girls between experimental group and control group

Conflict of Interest
Author doesn't have any Conflict of Interest.

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