

Role of combined exercise on primary dysmenorrhea pain among girls: a quasi-experiment

Papel do exercício combinado sobre a dor de dismenorréia primária em mulheres jovens: uma quase-experiência

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RESUMO | INTRODUÇÃO: Dismenorréia primária é uma dor que atinge o abdômen inferior antes e durante a menstruação. A dismenorréia primária é dor que mais afeta mulheres durante a adolescência. Felizmente, para muitas, o problema alivia à medida que amadurecem, particularmente após uma gravidez. Embora possa ser doloroso e por vezes debilitante por breves períodos de tempo, não é prejudicial. **OBJETIVO:** Investigar os efeitos de exercícios selecionados sobre a dor de dismenorréia primária em mulheres jovens. **MÉTODO:** Mulheres jovens com idade de $21,1 \pm 2,0$ anos foram incluídas neste estudo. A intervenção com exercícios incluiu fortalecimento do grupo muscular central (Core), flexibilidade, exercícios do barril e de resistência. A duração da intervenção foi de nove semanas com frequência de duas sessões por semana e duração de 30 minutos. O projeto foi aprovado pelo comitê de ética no hospital de Kasturba Universidade de Manipal, Índia (número de registro: IEC315 / 2015) **RESULTADOS:** Os exercícios reduzem a intensidade da dor entre mulheres jovens com dismenorréia. A escala analógica visual (VAS) foi utilizada para medir a intensidade da dor. Houve uma diferença significativa na pontuação para as condições pré-teste (6.94 ± 1.33) e pós-teste (5.02 ± 1.15), $p < 0,001$. **CONCLUSÃO:** Este estudo mostra que o exercício misto de flexibilidade, estabilidade do centro de força e exercício do barril pode reduzir a dor primária da dismenorréia entre as meninas.

PALAVRAS-CHAVE: Dismenorréia. Exercício. Dor pélvica. Mulheres.

ABSTRACT | INTRODUCTION: Primary dysmenorrhea is the pain of lower abdominal before and during the menstruation. Primary dysmenorrhea is more likely to affect girls during adolescence. Fortunately for many women, the problem eases as they mature, particularly after a pregnancy. Although it may be painful and sometimes debilitating for brief periods of time, it is not harmful. **OBJECTIVE:** The purpose of this study was to investigate effects of selected exercise on primary dysmenorrhea pain among girl. **METHOD:** Young women aged (21.1 ± 2.0) were included in this study. The intervention with exercises included core strengthening, flexibility, kegel and endurance exercises. The duration of the intervention was eight weeks, two times per week with duration of 30 minutes per session. Visual Analogue Scale (VAS) was used to measure the intensity of pain. **RESULTS:** The results show that exercise effects to reduce pain intensity among young women with dysmenorrhea. There was a significant difference in the score for pre-test (M: 6.94, SD: 1.33) and post-test (M: 5.02, SD: 1.15) conditions; $t(9.1) = 2.34$, $p = 0.000$. **CONCLUSION:** This study shows that the mixed exercise of flexibility, core stability and kegle exercise can reduce the primary dysmenorrhea pain among girls.

KEYWORD: Dysmenorrhea. Exercise. Pelvic pain. Women.

Introduction

Primary dysmenorrhoea refers to recurrent, crampy lower abdominal pain that occurs during menstruation in the absence of pelvic pathology¹. It is one of the most common gynaecological problems in menstruating women and it was reported prevalence rates are as high as 90 percent², and this pain affects quality of life and daily activities. Primary dysmenorrhoea is caused by excessive levels of prostaglandins³. The pain probably results from contractions of the uterus that occur when the blood supply to the endometrium is reduced, and may progressively become worse as endometrial tissue shed and pass through the cervix⁴. Other factors that make the pain worse include extroverted uterus, lack of exercise, and psychological or social stress⁵. Several risk factors were associated with primary dysmenorrhea including earlier age at menarche, long menstrual periods, extroverted uterus, smoking, obesity, and alcohol consumption, social and psychological stress⁶. The symptoms of dysmenorrhea are pain in the lower abdomen, in the umbilical region or the suprapubic region of the abdomen. It may radiate to the thighs, lower back, nausea, vomiting, diarrhoea or constipation, headache, dizziness, disorientation, hypersensitivity to sound, light, smell and touch, fainting, fatigue and sometimes radiating pain into the legs either one side or both side⁷. Primary dysmenorrhea can be treated through medical, surgical management and physiotherapy management in relieving pain. It has a negative impact on the quality of life of young women which affects their academic and social life. Interventions such as exercise, behavioural training help in reducing the symptoms of primary dysmenorrhea and improving the adolescent girls quality of life⁸. The following are the literature reviews on exercises and primary dysmenorrhea.

A previous study showed that physical activity reduced pain symptoms in girls with primary dysmenorrhea who were given eight weeks of exercises such as stretching and strengthening exercises compared to a group that was not given physical exercises⁹. Another study was conducted to examine exercise interventions for reducing primary dysmenorrhea symptoms¹⁰. Women aged between 18 to 45 years old were selected for vigorous aerobic training on a treadmill three times a week, for four weeks and the results showed that exercise may alleviate the symptoms associated with primary dysmenorrhea.

Home based exercise intervention helps in improving health related quality in life and pain in women aged 16 – 39 years with primary dysmenorrhea. The exercise intervention included stretching, aerobic exercises and relaxation exercises done for 40 minutes three times a week¹¹. In addition, stretching exercises reduced the symptoms of primary dysmenorrhea among young girls¹². Core strengthening exercise by improving the pelvic and abdominal muscles reduces the primary dysmenorrhea pain¹. Mixed intervention of hot water and exercise were used to relief pain and menstrual distress in this girls aged 13-15 years¹³. Mixed exercise of strengthen and stretching can be more effective to reduce pain, and can be done at home with and without coach supervision. According to best of our knowledge there is lack of studies that used mixed exercise for primary dysmenorrhea pain. The purpose of this study was to investigate effects of mixed exercise on pain reduction of primary dysmenorrhea.

Methodology

Participants of the study

This study was a quasi-experimental design to find out the effects of mixed exercise on primary dysmenorrhea pain. Fifty seven students from School of Allied Health Sciences, Manipal University were recruited for this study. Their age varied from age 18 to 24 years old with primary dysmenorrhea. Informed consent was obtained from the participants who meet the inclusion criteria. This study was in agreement with the principle of Helsinki Declaration and approved by the ethical committee in Kasturba hospital Manipal university (registration No: IEC315/2015). Participants, who consumed contraceptive pills or non-steroidal anti-inflammatory drugs, diagnosed musculoskeletal or neuromuscular problem and students of physiotherapy were excluded from the study¹⁴. Verbal advertisement was given in the SOAHS. Participants were given introduction about the study and how it would be conducted. Screening questionnaires were given to students who were willing to participate in the study and 57 participants with primary dysmenorrhea were screened out of the 57 students, seven of them were excluded for the following reasons: 1. Consumption of non-steroidal

anti-inflammatory drugs. 2. Musculoskeletal pain. 3. Neuromuscular disorder. 4. Alternative treatment. 5. Hormonal problem.

Test procedure

Before and after the intervention the pain was measured with Visual analogue scale (VAS) from 0 to 10¹⁵. A VAS pain scale measures a patient's pain intensity. Pain scales are based on trust or imaginary data. Self-report is considered primary and should be obtained if possible. VAS test was done two times of before and after exercise session.

Exercise protocol

Duration of the intervention was eight weeks and two sessions per week, each session 30 minutes. Before the exercise participants performed five minutes warm up and after exercise five minutes cooling down. The exercise protocol included core stability, kegel, stretching, jogging, Swiss ball, and relaxation exercises^{16,17}. The intensity of exercises increased gradually and was measured by Borg Ratings of Perceived Exertion.

Exercises description:

1) Perform diaphragmatic breathing exercise with both knees bend in lying position. Repeat for 10 times;



2) In lying position, bring both knees towards the chin as much as possible then straighten back the legs. Repeat for 10 times;



3) Stand with both feet together and knees bend. Hold a roll of cloth. Repeat for 10 times;



4) In lying position bend the knees with hands by the side, lift up the hips and hold it for 10 seconds. Repeat for 10 times;



5) In lying position bend the knees and turn it to right and left alternately. Repeat for 10 times;



6) In lying position bend the both knees and squeeze the uterus and hold it for 10 seconds. Repeat it for 10 times;



7) Seated on the Swiss ball, gently rock your hips forward and back, clockwise and counter clockwise. Repeat it 10 times.



Data Analysis

Data was analysed by the SPSS software version 23. Paired Samples T-Test was used to analysis data of visual analogue scale and compares pre and post-test data. And the level of significance is set at .05.

Results

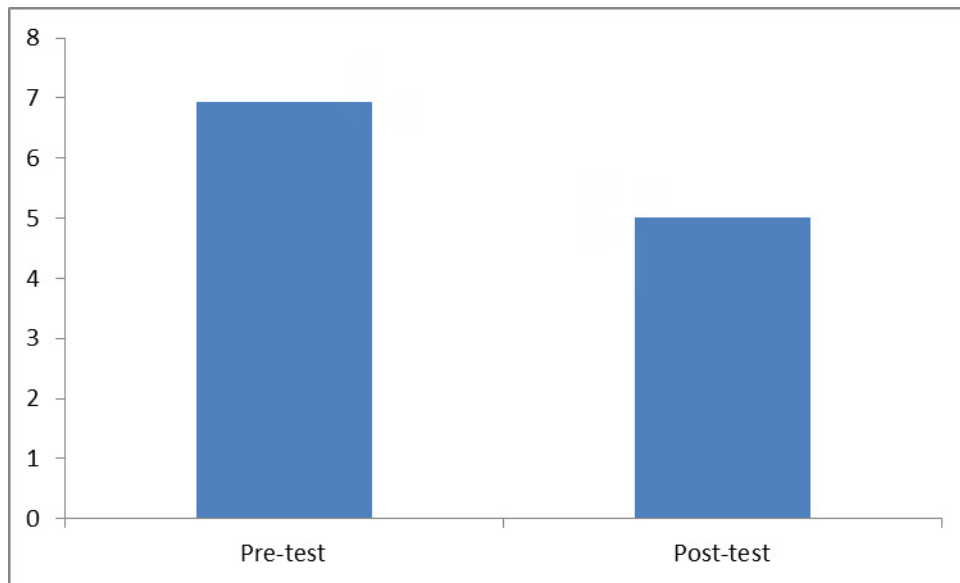
Description of participants means and standard deviations of weight, age, and height are shown in table 1.

Table 1. Description of Participants

Variable	Mean ±SD
Age	21.1±2.0
Weight	52±2.29
Height	162.34±6.37

A paired sample T-test was conducted to compare pain intensity before and after exercise program. There was a significant difference in the score for pre-test (M: 6.94, SD: 1.33) and post-test (M: 5.02, SD: 1.15) conditions; $t(9.1) = 2.34, p = 0.000$. Figure 1 also showed the reduction of pain with 30% reduction.

Figure 1: Mean difference between pre and post-test of pain reduction



Discussion

This study was to find out whether mixed exercise program have effect on pain during menstruation. In our study exercise intervention was implemented for 50 participants with primary dysmenorrhea. Mixed exercises were given for 16 sessions and with for 30 minutes each session. Previous studies have shown that physical activities and exercises such as aerobic, strengthening, stretching can help to reduce pain^{12,18,19}.

The purpose of current study was to investigate the effects of combined exercise on primary dysmenorrhoea pain. The results of current study showed that exercises effects on primary dysmenorrhea pain and it is indicated that the girl who involved in physical activity decrease the intensity of primary dysmenorrhea symptoms, and it was online with study of Chaudhuri et al.,¹³. In their cross sectional study and a randomised controlled trial that was conducted to estimate the prevalence of primary dysmenorrhea and to compare the impact of exercise and hot water bottle on the occurrence and severity of primary dysmenorrhea in high school girls aged 13-15 years reported a prevalence to be 60.7 %. Both exercise and hot water bottle were found to relief pain and menstrual distress in these girls¹³.

A randomised controlled trial study conducted on effects of exercise in high school girls aged 15-18 years suffering from primary dysmenorrhea concluded that the severity of dysmenorrhea decreases with decreasing duration and amount of menstruation and pain duration¹⁸. In addition they demonstrated that stretching exercises are effective in reducing pain duration and intensity among girls with primary dysmenorrhea. Flexibility of trunk, abdominal, back and hips may help to relax body and prevent muscles from contracting²⁰.

Strengthening of core muscles improve musculature activity surrounding the hip and lumbar spine to increase performance and reduce back pain¹. Core muscle strengthening improve the deep internal muscles such as transversus abdominis, rectus abdominis, multifidus, internal and external obliques, erector spinae (sacrospinalis) especially the longissimus thoracis which are close to spine and pelvic. Moreover, they can increase pelvic stability, improve abdominal muscle tone, improve posture, reduce back pain and prevent repetition of back injuries²¹.

Mixed exercise is more effective than single exercise. It may be because of mixed exercise have effects in all aspect of fitness such as muscles, joints and

cardiovascular fitness and is useful for prevention and mitigation of pain in all age groups. Regular mixed exercises have long-time effects on girls and women. In addition, recommendation of combined conventional and virtual reality exercise has high effects on fitness outcome²². Combined exercise can improve intermuscular coordination, dynamic flexibility, and movement efficiency^{23,24}.

The finding of current study has important implications for developing the types of exercise for women and girls, and also they can be performed at home with simple equipment. There were some limitations for this study, firstly the availability of participants and insufficient time to conduct the intervention. Secondly, there was no control group for this study. Future studies can be conducted as randomised control trials using a large sample of participants to compare types of exercise on symptoms of primary dysmenorrhea.

Conclusion

Exercise intervention for duration of two months showed reduction of pain in of participants. The exercises given may have some beneficial effect on reducing pain during menstrual cycle. Mixed exercise has more effects on all aspect of fitness level and can be done at home with and without coach supervision.

Authors' contributions

Kaur M, Bains BS, Ramachandran B, Rao BK participated in the study design, data collection and interpretation and paper writing.

Competing interests

No financial, legal or political competing interests with third parties (government, commercial, private foundation, etc.) were disclosed for any aspect of the submitted work (including but not limited to grants, data monitoring board, study design, manuscript preparation, statistical analysis, etc.).

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