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Original Research Article

Impact of pelvic rocking exercise on dysmenorrhea among adolescent girls

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ABSTRACT

Background: Pelvic rocking exercise is an exercise which contracts deep abdominal muscles and buttocks by taking deep breath, so that a small movement takes place inside the uterus. It is an exercise which strengthens the muscles of lower abdomen and back by taking deep breath. So that the pressure on blood vessels in the area around uterus is relieved. It helps to relieve menstrual discomfort through increased vasodilatation and subsequent decreased ischemia, release of endogenous opiates and suppression of prostaglandins. It is a non-pharmacological management of dysmenorrhea. It increases endorphin release which decreases pain perception and to suppress prostaglandin release. It is found to be effective in managing stress and is easy to practice. Present study aimed to evaluated the effectiveness of pelvic rocking exercise on dysmenorrhea.
Methods: Pre- experimental one group pre-test post-test design has been used to attain the objectives of the present study. 60 adolescent girls were selected by non- probability purposive sampling technique. Sociodemographic variables, menstrual history related data was collected and standardized Numerical Pain Rating Scale was used to assess the level of dysmenorrhoea among adolescent girls. Pelvic rocking exercise was the intervention done to evaluate its effect on the level of dysmenorrhea.
Results: Out of total adolescent girls, majority had moderate level of dysmenorrhea. There was a significant difference between the pre and post- intervention level of dysmenorrhoea.
Conclusions: Study concluded that the intervention of pelvic rocking exercise was significantly effective in reduction of dysmenorrhoea among the adolescent girls.

Keywords: Dysmenorrhoea adolescent girls, Effectiveness, Pelvic rocking exercise

INTRODUCTION

Menstruation, also known as a period, is the regular discharge of blood and mucosal tissue (known as menses) from the inner lining of the uterus through the vagina. Dysmenorrhea is painful menstruation of sufficient magnitude so as to incapacitate the day to day activities. The incidence of primary dysmenorrhea is about 15-20 percent.[1]

Dysmenorrhea is one of the most common gynaecological complaints in young women and teenage girls. Some home remedies are available for reducing dysmenorrhea such as applying heat in the abdomen and lower back, massaging

with essential oil for about 20 minutes, drinking ginger or mint teas or hot water flavoured with lemon, drinking chamomile tea has pain-relieving properties and helps to relax the uterus and decrease the production of prostaglandins, fennel seeds 30 mgs four times a day for three days, cinnamon, papaya, walnuts, pumpkin seeds, foods with high concentration of boron like avocados, drinking more water, exercise increases circulation to the pelvic region and releases endorphins to counteract the prostaglandins; hormone-like substances that cause the uterine muscles to contract during menstruation.[2]

Dysmenorrhea in adolescents is usually primary and is associated with normal ovulatory cycles and with no pelvic pathology. In approximately 10% of adolescents with severe dysmenorrhoea symptoms, pelvic abnormalities such as endometriosis or uterine anomalies may be found. The hormone prostaglandins and leukotrienes play an important role in generating the symptoms of dysmenorrhea.[3]

According to adolescent health problems in India: a review from 2001 to 2015 states that the prevalence of dysmenorrhea varies from 67.2 to 56.15% among adolescent girls in India. The incidence and epidemiology of dysmenorrhoea is difficult to establish due to the variety of criteria used to diagnose dysmenorrhoea and the subjective nature of the symptoms. A systematic review of studies in developing countries reported that 25% to 50% of adult women and 75% of adolescents experienced dysmenorrhoea and their usual activities was adversely affected in 5% to 20% of these women in the year 2010. The reports of dysmenorrhea are greatest among individuals in their late teens and 20s, with reports usually declining with age. One study indicated that 67.2% of adolescent females experienced dysmenorrhea.[4-5]

The exercise is widely accepted as a mean of moderating stress and biochemical changes in the immune system. Exercise such as walking, running, aerobic dance, pelvic rocking, bicycling and swimming that diminish cramping symptoms. Pelvic rocking exercise is an exercise which makes tiny movements in the pelvis. These movements are very effective in strengthening the back and abdominal muscle tone. Pelvic rocking is one of the best remedial measures to overcome menstrual pain.[6]

A cross-sectional study was conducted to study prevalence of primary dysmenorrhea in young girls and to evaluate associated clinical markers of dysmenorrhea in index medical college, hospital and research centre, Indore. By using VAS, 34.2% of girls experienced severe pain, 36.6% moderate and 29.2% had mild pain. It was concluded that dysmenorrhea is found to be highly prevalent among college going girls. Family history, bleeding duration and presence of clots were significant risk factors for dysmenorrhea.[7]

The Pelvic rocking/tilt exercise is an exercise which contracts deep abdominal muscles and buttocks by taking deep breath, so that some small movements takes place inside the uterus. This exercise strengthens the muscles of lower abdomen and back by taking deep breath so that the pressure on blood vessels in the area around uterus is relieved.[8] The pelvic tilt/ rocking is the orientation of the pelvis in respect to the thighbones and the rest of the body. The pelvis can tilt/ rock towards front, back or either side of the body. Pelvic tilt exercises introduce to proper pelvis positioning, and then may encourage to maintain tilt while moving the legs. Unilateral balancing exercises help to establish a proper pelvic tilt while balancing on one foot.[9]

The pelvic rocking exercise has a vital role in the reducing dysmenorrhea and can contribute positively in maintaining a healthy body. It helps to relieve menstrual discomfort through increased vasodilatation and subsequent decreased ischemia, release of endogenous opiates and suppression of prostaglandins. It is a non-pharmacological management of dysmenorrhea. It increases endorphin release which decreases pain perception and to suppress prostaglandin release.[10] The pelvic rocking exercise is useful in helping to alleviate back pain, reduce stiffness in the lower back, strengthen the abdominal muscles and to relax the spine.

Dysmenorrhea causes many adolescent girls to be absent in school, college and refrain from other activities. Menstrual discomfort is more prevalent among adolescent girls. Pelvic rocking exercise strengthens the pelvic and abdominal muscles and reduces dysmenorrhea.

Thus it necessitates to teach exercise to adolescent girls in order to decrease dysmenorrhoea, fatigue, weakness and nausea, strengthen abdominal muscles and help in physical as well as emotional recovery and to maintain a healthy reproductive life. In view to the above findings in literature and interest, the investigator is motivated and felt the need to pursue the present study, aims to evaluate the effectiveness of pelvic rocking exercise on dysmenorrhea among adolescent girls. This study aimed to assess the pre intervention level of dysmenorrhea among adolescent girls by using standardized numerical pain rating scale, to evaluate the effectiveness of pelvic rocking exercise on dysmenorrhea among adolescent girls. Also, to find out the association between the pre- intervention level of dysmenorrhea among adolescent girls with their selected socio demographic variables and menstrual history.

METHODS

In the present study, a quantitative evaluative research approach was used as the investigator aimed at evaluating the effectiveness of pelvic rocking exercise on dysmenorrhea among adolescent. Pre-experimental one group pre- test post- test research design was used for this study. The setting of the study was a hostel of nursing education institution. In the present study independent variable refers to pelvic rocking exercise on dysmenorrhoea among adolescent girls. The dependent variable refers to dysmenorrhoea of the adolescent girls.

The sociodemographic variables were adolescent girls age, religion, family type, family income in rupees per month, food pattern, mother's educational status, source of information about pelvic rocking exercise on dysmenorrhoea.

The menstrual history of adolescent girls included items such as age at menarche, number of days of menstruation, visit to the hospital for dysmenorrhoea, number of pads used per day and family history of dysmenorrhoea.

The accessible population of the present study was adolescent girls who had moderate to severe dysmenorrhoea studying in a college of nursing at Bengaluru, India. The sample of were adolescent girls studying in in 1st year and 2nd year. Nursing degree course, aged 17-19 years who reported moderate to severe dysmenorrhoea during their menstruation. Sample size consisted of 60 adolescent girl's age. Non-probability purposive sampling technique was adopted to select the sample.

Inclusion criteria

The adolescent girls with regular menstrual cycle, in the age group of 17-19 years, who all had moderate to severe dysmenorrhoea during their menstruation, and who were all willing to participate in this study were included.

Exclusion criteria

The adolescent girls who were on medications/ treatment for dysmenorrhoea, who were diagnosed with secondary dysmenorrhea and who had respiratory and spinal problems were excluded.

Data collection tools

A structured self- administered questionnaire was used to gather data regarding socio- demographic variables and menstrual history. A numerical pain rating scale is a standardized pain scale which is widely used for measuring the level of pain. Scale developed by Dr. Katy Hicks in the late 90's in southern California was used for assessing level of dysmenorrhea. It is a 10-point rating scale. The scores range from 0 (zero) which is considered as no pain, 1-3 is considered as mild pain (nagging, annoying, interfering little with activities of daily living), 4-6 is considered as moderate pain (interferes significantly with activities of daily living) and 7-10 is considered as severe pain (disabling; unable to perform activities of daily living) was used to interpret the level of dysmenorrhea.

Pelvic rocking exercise is an exercise which contracts deep abdominal muscles and buttocks by taking deep breath, so that a small movement takes place inside the uterus. It is an exercise which can be used for strengthening the muscles of lower abdomen and back by taking deep breath, so that the pressure on blood vessels in the area around uterus is relieved. During menstruation, it helps in reducing dysmenorrhoea among the adolescent girls. The structured tool was submitted to eight nursing experts in the field of Obstetrics and Gynaecological Nursing, two medical experts and one statistician. The reliability of the tool was established by inter rater method using the intra class correlation formula. The reliability correlation obtained was 0.868. The data collection was done the period between February 2019 to June 2019. Formal permission was obtained from the Principal of the institution.

Formal permission from the head of the institute and Ethical committee clearance of The Oxford college of Nursing, Bengaluru was obtained. Written consent from the adolescent girls was taken.

Implementation of pelvic rocking exercise

The implementation of the pelvic rocking exercise has been described here, First the pre- intervention level of dysmenorrhoea was assessed among the adolescent girls by using numerical pain rating scale, on their 1st day of menstruation and based on the level of dysmenorrhoea (moderate and severe), the adolescent girls were selected. The samples were divided into 6 groups and each group was instructed about pelvic rocking exercise with the help of videos and demonstration, followed by the intervention protocol to the adolescent girls to practice skilfully. All the adolescent girls were asked to do return demonstration of the pelvic rocking exercise under supervision. The total time duration of the procedure was 25-30 minutes. The adolescent girls from the 6th day of menstruation were made to do all steps of pelvic rocking exercise under guidance and supervision for a period of 4 weeks regularly twice daily; morning and evening before taking food. After 26- 28 days of pelvic rocking exercise regularly, the adolescent girls those who got next menstruation, Post intervention level of dysmenorrhoea was assessed by using numerical pain rating scale on the 1st day of menstruation.

RESULTS

Description of socio demographic variables of adolescent girls

Majority 31 (51.67%) belonged to the age of 19 years, 25 (41.67%) belonged to the age of 18 years. Majority 42 (70%) of them were Hindu. Majority 48 (80%) of the adolescent girls belonged to nuclear family, 22 (36.67%) of adolescent girls were in above rupees 30,000 income category, majority 48 (80%) of adolescent girls were having mixed food pattern, 29 (48.33%) of mothers of adolescent girls had completed secondary/higher secondary education, 58 (96.67%) of adolescent girls had were not aware of pelvic rocking exercise

Description of menstrual history of adolescent girls

Majority of the adolescent girls 81.67% attained menarche at 12-14 years, 10% attained menarche at 15 years and

above and 8.33% at less than 12 years. Majority (80%) of the adolescent girls had 3-6 days of menstruation, 11.67% of the adolescent girls reported more than 6 days of menstruation and 8.33% of the adolescent girls had less than 3 days of menstruation. Majority 91.66% (55) of the adolescent girls did not visit any hospital for dysmenorrhoea and 05 (8.33%) of the adolescent girls visited the hospital for treatment of dysmenorrhoea. Around 66.67% of the adolescent girls used 3-5 pads per day, 28.33% of the adolescent girls used less than 3 pads per day and 5% of the adolescent girls used more than 5 pads per day. Family history of dysmenorrhoea was depicted in 55% of the adolescent girls (Table 1).

Table 1: Frequency and percentage distribution of adolescent girls according to menstrual history (n=60).

Age in years	Frequency	Percentage
17 years	04	6.67
18 years	25	41.67
19 years	31	51.67
Age at menarche		
Less than 12 years	05	8.33
12-14 years	49	81.67
15 years and above	06	10
Number of days of menstruation		
Less than 3 days	05	8.33
3- 6 days	48	80
More than 6 days	07	11.67
Visit to the hospital for dysmenorrhea		
Yes	05	8.33
No	55	91.67
Family history of dysmenorrhoea		
Yes	33	55
No	27	45

Pre and post intervention level of dysmenorrhoea of adolescent girls

Table 2 shows that 70% of the adolescent girls had moderate level of dysmenorrhea and 30% girls had severe level of dysmenorrhea. Post interventional level of dysmenorrhea was significantly low. More than 65% girls had reported nil pain. None had severe pain. Only one third girls reported mild dysmenorrhea.

Table 2: Pre and post intervention level of dysmenorrhoea (n=60).

Level of dysmenorrhea	Pre-intervention level		Post intervention level	
	F	%	F	%
No pain	-	-	40	66.67
Mild pain			16	26.66
Moderate pain	42	70	04	6.67
Severe pain	18	30	-	-

Effectiveness of pelvic rocking exercise on dysmenorrhoea

The mean post intervention level of dysmenorrhoea score (0.817±1.524) of adolescent girls was lower than the mean pre intervention level of dysmenorrhoea score (6.233±1.332). The paired t value 34.242, was significant at 0.01 level. The mean deviation between pre intervention level of dysmenorrhoea and post- intervention level of dysmenorrhoea is 5.416. Thus, the intervention of pelvic rocking exercise was significantly effective in reduction of dysmenorrhoea among the adolescent girls (Table 3).

Table 3: Mean, standard deviation, mean deviation and paired t test value (n=60).

Test	Median	SD	MD	T value	P value
Pretest	6.233	1.322	5.416	34.242	0.001*
Post test	0.817	1.524			

*Significant at 0.01 level

Association between pre-intervention level of dysmenorrhoea with sociodemographic variables of the adolescent girls

The pre-intervention level of dysmenorrhoea had no association with by age, religion, family type, family income, food pattern and mother's educational status, age at menarche, number of days of menstruation, visit to the hospital for dysmenorrhoea, and family history of dysmenorrhoea.

DISCUSSION

Adolescence is one of the most rapid phases of human development. By late adolescence, 75% of girls experience some problem associated with menstruation. Delayed, irregular, painful, and heavy menstrual bleeding are leading reasons for physician office visits by adolescents, and dysmenorrhea is the leading reason for school absenteeism among girls.[11]

In the present study the pre intervention level of dysmenorrhoea among 60 adolescent girls assessed showed that, 70% had moderate level of dysmenorrhea and 30% reported severe level of dysmenorrhea. This finding is similar to a cross sectional study conducted to describe the prevalence, severity, impact and treatment aspects of dysmenorrhoea in females of reproductive age group in tertiary care teaching hospital, Gujarat, India wherein 56.57% females reported dysmenorrhea, Dysmenorrhea requires the attention and should be better managed by appropriate change in lifestyle, support and medicine.

Age at menarche

In the present study the age of menarche in majority 81.67% of the adolescent girls was 12 to 14 years. This is similar to findings in several studies wherein the mean age

at menarche was 12.87 years (SD±1.45) by 27, 33, 34, 37 (13 yrs.). According to study in Bangladesh more than 48% girls already attained menarche within the age of 12 years, among them 25.6%, 41.0%, and 58.3% girls experienced menarche at the age of 10, 11, and 12 years, respectively. Another study in Bangladesh also mentioned as 10 to 12 years.[12]

Pre and post intervention level of dysmenorrhoea of adolescent girls

Out of total adolescent girls, 70% were had moderate level of dysmenorrhea and 30% had severe level of dysmenorrhea. The assumption i.e. dysmenorrhoea is a most common gynaecological complaint among adolescent girls was statistically significant. This finding was similar to findings in others studies. A study in Rajkot, Gujrat, India showed that out of 350 females, 198 (56.57%) females had dysmenorrhea. Dysmenorrhoea was observed more common in unmarried females (93.43%) and in age group of 15-19 year (48.28%). [13] In a study done in Nasik the prevalence of dysmenorrhea was 65.82%.[14]

In Lucknow prevalence of dysmenorrhoea was found to be 73.9% with 74.4% girls in urban schools and 72.7% girls in rural schools.[15] In Udupi the prevalence of dysmenorrhoea in adolescent girls was found to be 146 (62.70%). Out of 233 samples 28 (12%) had mild pain, 77 (33%) had moderate pain and 41 (17.6%) had severe pain during menstruation.[16]

A study in south Gujarat showed that out of 116 students, 45% had primary dysmenorrhea. Another study done in Bangalore, the prevalence of dysmenorrhea was 62.5%. Dysmenorrhea among girls in Kadapa district study was 65%. The prevalence of dysmenorrhea was 73.83%; in Bhubaneswar, Orissa. The prevalence of primary dysmenorrhea was 89.1% in Iran.[17] The prevalence rate of dysmenorrhea was 83.6% with more than half describing their pain which lasts less than 3 days as moderate in tamale. Prevalence of dysmenorrhoea was found to be 71.2% in Surat.[18]

Effectiveness of pelvic rocking exercise on dysmenorrhoea

Pelvic rocking exercise is an exercise which contracts deep abdominal muscles and buttocks by taking deep breath, so that a small movement takes place inside the uterus. It is an exercise which strengthens the muscles of lower abdomen and back by taking deep breath. So that the pressure on blood vessels in the area around uterus is relieved. It helps to relieve menstrual discomfort through increased vasodilatation and subsequent decreased ischemia, release of endogenous opiates and suppression of prostaglandins. It is a non-pharmacological management of dysmenorrhea. It increases endorphin release which decreases pain perception and to suppress prostaglandin release. It is found to be effective in managing stress as well as it is one of the easiest exercise that can be followed without proper training. This study applied this technique to reduce the level of dysmenorrhoea among adolescent girls.

The findings of the present study reveals that the mean post intervention level of dysmenorrhoea score (0.817±1.524) of adolescent girls was lower than the mean pre intervention level of dysmenorrhoea score (6.233±1.332), paired t value of 34.242, was significant at 0.01 level. Intervention of pelvic rocking exercise was significantly effective in reduction of dysmenorrhoea among the adolescent girls. This was corroborated in similar studies done with regard to implementation of pelvic rocking exercise for management of dysmenorrhea in various Indian states.[19, 20]

The findings of the present study were similar to an experimental research study on done among adolescent girls aged 15-20 years residing in selected villages. Numerical rating pain scale was used to assess the pre-test level of dysmenorrhoea. Experimental group received pelvic rocking exercise for 3 weeks. Study concluded that rendering pelvic rocking exercise to the adolescent girls was effective in reduction of dysmenorrhea. [21] These findings are also similar to the finding of studies done in a schools in, India.[22-25]

The present study subjects were pursuing nursing studies. Other studies on impact of pelvic rocking exercise on dysmenorrhea wherein adolescent girls pursuing different educational streams were the participant also revealed that pelvic rocking exercise was effective in reducing pain and discomfort of dysmenorrhoea among nursing students.[26]

The pelvic rocking exercise is the ideal source of exercise for relieving dysmenorrhea among adolescent girls. The exercise has been helped to relieve a menstrual discomfort through an increased vasodilatation and subsequent decreased ischemia, release of endogenous opiates, specifically beta endorphins inhibiting the production and release of prostaglandins. It was very helpful to reduce pain, stimulates blood circulation, and relax the abdominal muscles. No complications will develop. This exercise strengthens the muscles of the abdomen and lower back. Through the study, it is evidenced that dysmenorrhoea can be reduced without intake of medicine.[27]

Study implies that the benefit of pelvic rocking exercise can be propagated by conducting school health programme for screening the gynaecological problems and conduct workshop about the method and effect of pelvic rocking exercise on dysmenorrhea. The school going adolescents can be provided opportunities to attend training programs on non-Pharmacological methods like pelvic rocking exercise for reducing dysmenorrhea.

CONCLUSION

The present study attempted to evaluate the effectiveness of pelvic rocking exercise on management of

dysmenorrhea. There was a significant difference between the pre- intervention and post- intervention level of dysmenorrhoea. Thus, pelvic rocking exercise was significantly effective in reduction of dysmenorrhoea among the adolescent girls.

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