



Effectiveness of pelvic rocking exercise on Dysmenorrhoea among adolescent girls

Nizy John¹, Rajitha SR²

¹ M.Sc(N) Student, Christian College of Nursing, Neyyoor, Kanyakumari District, Tamil Nadu, India

² Assistant Professor, Christian College of Nursing, Neyyoor, Kanyakumari District, Tamil Nadu, India

Abstract

Dysmenorrhoea is the most common gynaecologic complaint and represents the leading cause of periodic college or school absenteeism. It is one of the common health problems among women during their reproductive years. Pelvic rocking exercise has been found to relieve menstrual discomfort, relieving pain, improving flexibility restoring mobility, increasing circulation in the discs and spinal tissues, releasing the tight back muscles and maintaining good abdominal tone. The objectives of the study were to assess the pre-test and post-test level of dysmenorrhoea among adolescent girls in experimental and control group, to find out the effectiveness of pelvic rocking exercise on dysmenorrhoea among adolescent girls and to associate the pre-test level of dysmenorrhoea with selected demographic and clinical variables in experimental and control group. A quasi experimental with pretest-posttest control group design was used in this study. The study was conducted in selected arts and science colleges at Kanyakumari District. The samples consisted of 60 adolescent girls. Among them, 30 samples were allotted to the experimental group and 30 samples were allotted to the control group and selected by purposive sampling technique on the basis of inclusion criteria. The tools used for data collection were Demographic Variables, Clinical Variables and Numerical Pain Rating Scale. The study revealed that, the pre-test mean score of dysmenorrhoea was 75.67 ± 13.085 and the post-test mean score was 45.33 ± 27.17 . The mean difference was 30.34 and the paired 't' value was 5.511. The obtained 't' value was higher than the table value in experimental group. Hence, it was highly significant at 0.05 level. In control group, the pre-test mean mean score of dysmenorrhoea was 75.33 ± 14.079 and the post-test mean score was 70.33 ± 17.221 . The mean difference was 5 and the paired 't' value was 1.231. The obtained 't' value was lower than the table value. Hence, it was not significant at 0.05 level. The study concluded that, pelvic rocking exercise was effective in reduction of dysmenorrhoea among adolescent girls.

Keywords: effectiveness, pelvic rocking exercise, dysmenorrhoea, adolescent girls

Introduction

"To enjoy the glow of good health you must exercise".

- Gene Tunney

The word adolescence is Latin in origin, derived from the verb *adolescere*, which means "to grow into adulthood." Adolescence is a time of moving from the immaturity of childhood into the maturity of adulthood. There is no single event or boundary line that denotes the end of childhood or the beginning of adolescence [1]. Adolescence is the period of transition between childhood and adulthood. It includes some big changes - to the body and to the way a young person relates to the world. The many physical, sexual, cognitive, social and emotional changes that happen during this time can bring anticipation and anxiety for both children and their families [2].

Adolescence is often divided into three psychosocial developmental phases: early adolescence (11 to 13 years), middle adolescence (14 to 16 years) and late adolescence (17 to 21 years). In early adolescence, they begin to separate from their parents and establish an individual identity. At the beginning of adolescence, cognitive abilities are dominated by concrete thinking. Middle adolescence is characterized by growth in emotional autonomy and increasing separation from family. These adolescents begin to understand the relationship between health behaviors and future health status, but peer pressure makes it challenging to make health-related choices. During late adolescence, young people become increasingly more economically and

emotionally independent. Peer group values become less important and young people spend more time in a relationship with one person. The late stage of adolescence is characterized by the development of a strong personal identity [3].

Dysmenorrhoea is pain during menstruation. It is also known as painful periods or menstrual cramps. Its usual onset occurs around the time that menstruation begins. Symptoms typically last less than three days. The pain is usually in the pelvis or lower abdomen. Other symptoms may include back pain, diarrhoea or nausea [4]. It is classified into primary and secondary. Primary dysmenorrhoea occurs when pelvic anatomy and ovarian function are normal and no organic cause can be found for menstrual pain. Secondary dysmenorrhoea describes pain due to pelvic pathology. It can occur at any age but most commonly observed in women 20 - 45 years of age [5].

The treatment options for dysmenorrhoea can include pain-relieving medication, such as paracetamol, medication that inhibits prostaglandins, such as ibuprofen or other anti-inflammatory medication, regular exercise and attention to overall physical fitness, applying heat to the abdomen such as a hot water bottle, relaxation techniques, the oral combined contraceptive pill, which reduces prostaglandins and therefore reduces pain and bed rest during the first day or so of the period [6].

Exercises help in reducing pain, relieving stress, elevating

mood and improving health. Women who exercise show less severe dysmenorrhoea and greater positive effects than women who are sedentary. Exercise reduces menstrual cramps and improves associated symptoms. Health care providers suggest some forms of aerobic exercises such as pelvic rocking and tilting, walking and bicycling beneficial for dysmenorrhoea [7].

Need for the Study

The prevalence of dysmenorrhoea worldwide is similar to that in the United States. Reported prevalences have ranged from 15.8% to 89.5%, with higher rates reported in adolescent populations. The most common causes of dysmenorrhoea differ by age. The prevalence of this condition is estimated to be 25% among adult women and as high as 90% among adolescents [8].

The spasmodic rates of dysmenorrhoea ranging from 16% to 91% with higher rates reported in adolescent populations. Furthermore, the prevalence rate is estimated to be 85% in the United States of America, 84.1% in Italy and 40.7% in India [9]. Prevalence of dysmenorrhoea varies widely across the world ranging from 15 to 94%. Dysmenorrhoea, which can be so debilitating to disrupt the daily activities, work and schooling of post pubescent females is therefore of public health concern. Various risk factors associated with dysmenorrhoea which includes age less than 20 years, nulliparity, higher socioeconomic status, heavy menses, depression, smoking, anxiety and lack of physical activity [10].

The prevalence of dysmenorrhoea worldwide ranges 15.8 - 89.5% with higher prevalence rates reported in the adolescent population. A similar scenario exists in India. The prevalence of dysmenorrhoea was found to be 78.69% in a study conducted in Gwalior among higher secondary schoolgirls. Dysmenorrhoea is frequently associated with sickness absenteeism, decrease in academic performance and decrease in physical and social activities in adolescents. In spite of the frequency and severity of dysmenorrhoea, most girls do not seek medical treatment for this condition because they feel it is a normal part of the menstrual cycle. Therefore, dysmenorrhoea affects not only the untreated person but also her family, her social life and national economics as well [11].

In 60-90% of adolescent girls in India, dysmenorrhea is a major cause for absenteeism from school or restriction of activities of daily living or social interaction. Exercise today is an integral part of normal life for many women. It is clear that there are many health benefits for women who exercise regularly and in moderation. Exercise improves cardiovascular status, increases bone mineral content; improves dysmenorrhoea and premenstrual syndrome symptoms [12]. Exercise reduces menstrual cramps and improves associated symptoms. Health care providers suggest some forms of aerobic exercises such as pelvic rocking and tilting, walking and bicycling beneficial for dysmenorrhoea [7].

Today, dysmenorrhoea is a major problem in our country. Most of the adolescent girls are having school or college absenteeism due to dysmenorrhoea and they are unaware about the treatment modalities. There is a lot of literature regarding the treatment of dysmenorrhoea with non pharmacological measures. Pelvic rocking exercise is an effective, simple and non-pharmacological measure to reduce dysmenorrhoea among adolescent girls. It does not

need any cost and natural method of pain reduction. Hence, the researcher has interested to do the study regarding the pelvic rocking exercise on reduction of dysmenorrhoea among adolescent girls.

Statement of the Problem

“A Quasi Experimental Study to Assess the Effectiveness of Pelvic Rocking Exercise on Dysmenorrhoea among Adolescent Girls in Selected Arts and Science Colleges at Kanyakumari District, Tamilnadu, India”.

Objectives of the Study

1. To assess the pre-test and post-test level of dysmenorrhoea among adolescent girls in experimental and control group.
2. To find out the effectiveness of pelvic rocking exercise on dysmenorrhoea among adolescent girls in experimental and control group.
3. To associate the pre-test level of dysmenorrhoea with selected demographic variables among adolescent girls in experimental and control group.
4. To associate the pre-test level of dysmenorrhoea with selected clinical variables among adolescent girls in experimental and control group.

Hypotheses

All hypotheses will be tested at 0.05 level of significance.

H₁: There will be a significant difference between pre-test and post-test mean scores of dysmenorrhoea among adolescent girls in experimental and control group.

H₂: There will be a significant association between pre-test level of dysmenorrhoea and selected demographic variables among adolescent girls in experimental and control group.

H₃: There will be a significant association between pre-test level of dysmenorrhoea and selected clinical variables among adolescent girls in experimental and control group.

Assumptions

- Pain perception varies from each individual.
- Pelvic rocking exercise may help in alleviating menstrual discomfort and maintaining good abdominal tone.
- It provides strength and flexibility for abdominal and pelvic muscles.
- It promotes better sleep and relaxation.
- It contracts deep abdominal muscles and buttocks by taking deep breath.

Limitations

- Data collection period is limited to 6 weeks.
- Data collection is limited to samples those who are willing to participate in the study.
- The sample size is limited to 60.
- The study is limited to adolescent girls between the age group of 18 and 20 years.

Review of Literature

Khairiyah, I. Pertiwi, S. and Ratnasari, N. (2018) did a study on “The effect of pelvic rocking exercise towards primary dysmenorrhoea pain among junior high school grade 8”. This was a quasi experimental research with one group pretest - post test design. The population in this study was 163 samples. Purposive sampling technique was used. The result found that, primary dysmenorrhoea pain before pelvic

rocking exercise in female students mostly in moderate pain category and after pelvic rocking exercise the pain decreased to mild pain category. This study concluded that, pelvic rocking exercise was effective in primary dysmenorrhoea^[13].

Mohammed, H. and Nafez, A. (2017) conducted a study on "The effect of practicing pelvic rocking exercise on primary dysmenorrhoea among adolescent girls". A quasi experimental research design with pre-post assessment was used. Following the intervention, pain intensity scores decreased significantly ($p < 0.0001$) in the experimental group as compared to control group during the first and second cycle. Based on the result, the application of pelvic rocking exercise for adolescent girls who were suffering from moderate to severe primary dysmenorrhoea had a positive effect in reducing pain intensity scores, pain duration and menstrual flow duration^[14].

Mujawar, N. *et al.*, (2016) had done a study on "Effect of exercises on primary dysmenorrhoea in young females". Here a convenient sample is taken consisting of 40 participants. This was an experimental study. Visual analogue scale and verbal multidimensional scoring system is used in this study for pre-treatment and post-treatment comparison of Group A and Group B was done using Mann Whitney U test. The difference in mean visual analogue scale score and verbal multidimensional scoring system for assessing of dysmenorrhoea severity between the group was significant ($u=31.0, p < 0.001$) and ($u=12.0, p < 0.001$)^[15].

Verma, A. (2014) conducted a study on "A randomized control trial to assess and evaluate the effectiveness of pelvic rocking exercises in reducing dysmenorrhoea among girls of selected Colleges of Nursing in New Delhi". This study used the quantitative experimental research approach. Two group pretest-posttest design. Sixty samples selected by systematic random sampling. Verbal Descriptor Scale to assess intensity of pain during menstruation. The result showed that, the intensity of the pain in the exercise group declined from 8.59 to 4.63 in the third period and 2.84 in the fourth period ($p < 0.01$). The study concluded that, the effect of pelvic rocking exercise was effective in reducing dysmenorrhoea^[12].

Research Approach and Design

To accomplish the objectives of the study, the researcher was chosen quantitative research approach. A quasi experimental with pretest-posttest control group design was used in this study. The diagrammatic representation of the research design is given below.

Experimental group O₁ X O₂

Control group O₃ - O₄

O₁ - Pre-test assessment of dysmenorrhoea in experimental group

O₂ - Post-test assessment of dysmenorrhoea in experimental group

X - Administration of pelvic rocking exercise to the experimental group

O₃ - Pre-test assessment of dysmenorrhoea in control group

O₄ - Post-test assessment of dysmenorrhoea in control group

Variables

Independent Variable - Pelvic rocking exercise

Dependent Variable - Dysmenorrhoea

Setting of the Study

Experimental Group: Lekshmiipuram College of Arts and Science, Neyyoor

Control Group: Muslim Arts and Science College, Thiruvithancode

Due to the feasibility and familiarity of the setting, the researcher has chosen the above settings for the study.

Population and Sample

The target population was composed of all adolescent girls who were studying in selected arts and science colleges. The accessible population was composed of all adolescent girls with dysmenorrhoea in the age group of 18 - 20 years in selected arts and science colleges. Adolescent girls who fulfilled the inclusion criteria were selected as a sample.

Sample Size and Sampling Technique

The sample size was consisted of 60 adolescent girls. Among them, 30 samples were allotted to the experimental group and 30 samples were allotted to the control group. They were selected by purposive sampling technique on the basis of inclusion criteria.

Criteria for Sample Selection

Inclusion Criteria

Adolescent girls who were

- in the age between 18 and 20 years
- having regular menstrual cycle for the last three months
- available during the data collection period
- having moderate and severe dysmenorrhoea
- having regular exercise habit

Exclusion Criteria

Adolescent girls who were

- having secondary dysmenorrhoea
- not willing to participate in the study
- unable to understand and speak Tamil or English language
- receiving pharmacological therapies for controlling pain during menstruation

Research Tool

The researcher used three data collection instruments.

Section – A. Demographic Variables: It helps to collect the baseline socio demographic information about the samples. It consisted of age, religion, type of family, place of residence, family monthly income, dietary habit and source of health awareness among adolescent girls.

Section - B. Clinical Variables: It helps to collect the health related information about the adolescent girls. It consisted of age at menarche, weight, menstrual pain onset, pattern of menstrual cycle, duration of menstruation, family history and college absenteeism due to dysmenorrhoea among adolescent girls.

Section – C. Numerical Pain Rating Scale: It helps to assess the level of dysmenorrhoea among adolescent girls. There are four options given for this numerical pain rating scale. Total obtainable score was 10. The obtained score was interpreted as follows,

- 0 No pain
- 1 - 3 Mild pain

- 4 - 6 Moderate pain
- 7 – 10 severe pain

Content Validity and Reliability

The demographic variables, clinical variables, numerical pain rating scale and pelvic rocking exercise outline were given to ten experts in the field of Obstetrics and Gynaecology, Biostatistics, Physiotherapy, Medicine and Nursing. They were requested to give their valuable suggestions on the appropriateness and relevance of the items in the tool. According to their suggestions, the tool was modified. The reliability of the tool was assessed by test-retest method. Karl Pearson formula was used and the ‘γ’ value was found to be 0.86 which indicated that the tool was highly reliable.

Pilot Study

A pilot study was at selected Arts and Science Colleges at Kanyakumari District among 10 samples in a manner in which the final study would be done. Data were analyzed to find out the suitability of statistics. The pilot study showed that, the study was feasible.

Results

Table 1: Frequency and Percentage Distribution of Adolescent Girls on Selected Demographic Variables in Experimental and Control Groups

Demographic Variables	Experimental Group (n=30)		Control Group (n=30)	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Age in Years				
18 - 19	28	93.33	21	70
19 - 20	2	6.67	9	30
Religion				
Christian	17	56.66	18	60
Hindu	11	36.67	10	33.33
Muslim	2	6.67	2	6.67
Type of Family				
Nuclear	25	83.33	25	83.33
Joint	5	16.67	5	16.67
Place of Residence				
Urban	12	40	11	36.67
Rural	18	60	19	63.33
Family Monthly Income				
Below Rs. 10,000	11	36.67	10	33.33
Rs. 10,001 – 20,000	16	53.33	17	56.67
Above Rs. 20,000	3	10	3	10
Dietary Habit				
Vegetarian	3	10	2	6.67
Non vegetarian	27	90	28	93.33
Source of Health Awareness				
Mass media	4	13.33	3	10
Education	17	56.67	16	53.33
Medical personnel	7	23.33	8	26.67
Friends	2	6.67	3	10

Table - 1 showed that, majority 93.33% belongs to the age group of 18 – 19 years, 56.66% were Christians, majority 83.33% belongs to nuclear family, 60% residing in rural area, 53.33% having the monthly income of Rs. 10,001 – 20,000, majority 90% of them are non vegetarians and 56.67% got health awareness through education in experimental group.

Data Collection Procedure

Formal permission was obtained from the head of the institutions. The researcher introduced herself individually to the selected groups of samples and obtained their consent. Then, the study was explained and assurance given regarding confidentiality of the answers. The samples were asked to respond the questionnaire that consisted of demographic variables, clinical variables and numerical pain rating scale according to the instruction given in the tool (pre-test).

On the next day of pre-test, the researcher demonstrated pelvic rocking exercise to the experimental group with the help of pamphlet. The researcher encouraged the samples to do the exercise twice a day. Weekly follow up was done and advised them to maintain a diary daily. Routine care was given to control group. Post-test was conducted with the same questionnaire after 4 weeks of pre-test in both groups. Finally, the researcher explained about the pelvic rocking exercise and its benefits with the help of pamphlet to the control group. The researcher thanked the samples for their co-operation. All the data were kept confidential.

In control group, 70% belongs to the age group of 18 – 19 years, 60% were Christians, majority 83.33% belongs to nuclear family, 63.33% residing in rural area, 56.67% having the monthly income of Rs. 10,001 – 20,000, majority 93.33% of them are non vegetarians and 53.33% got health awareness through education.

Table 2: Frequency and Percentage Distribution of Adolescent Girls on Selected Clinical Variables in Experimental and Control Groups

Clinical Variables	Experimental Group (n=30)		Control Group (n=30)	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Age at Menarche				
Below 9 years	3	10	3	10
10 – 12 years	17	56.67	22	73.33
13 – 15 years	9	30	4	13.34
Above 15 years	1	3.33	1	3.33
Weight in Kilogram				
Below 40 kg	3	10	3	10
41 – 45 kg	5	16.67	13	43.33
46 – 50 kg	19	63.33	12	40
Above 50 kg	3	10	2	6.67
Menstrual Pain Onset				
1–2 days before menstruation	2	6.67	3	10
First day of menstruation	26	86.66	24	80
Second day of menstruation	2	6.67	3	10
Pattern of Menstrual Cycle				
21 – 25 days	2	6.67	5	16.67
26 – 30 days	25	83.33	22	73.33
31 – 35 days	3	10	3	10
Duration of Menstruation				
1 – 3 days	3	10	6	20
4 – 6 days	22	73.33	21	70
More than 6 days	5	16.67	3	10
Family History of Dysmenorrhoea				
Yes	19	63.33	21	70
No	11	36.67	9	30
College Absenteeism due to Dysmenorrhoea				
Yes	15	50	18	60
No	15	50	12	40

Table – 2 inferred that, 56.67% attained menarche at around the age of 10 – 12 years, 63.33% maintained the body weight of 46 – 50 kg, majority 86.66% of them are having menstrual pain onset at their first day of menstruation, 73.33% having 26 – 30 days of menstrual cycle, 73.33% of them were having the duration of menstruation around 4 – 6 days, 63.33% of them were having the family history of dysmenorrhoea and 50% having college absenteeism due to dysmenorrhoea in experimental group.

In control group, 73.33% attained menarche at around the age of 10 – 12 years, 43.33% maintained the body weight of 41 – 45 kg, 80% of them are having menstrual pain onset at their first day of menstruation, 73.33% having 26 – 30 days of menstrual cycle, 70% of them were having the duration of menstruation around 4 – 6 days, 70% of them were having the family history of dysmenorrhoea and 60% having college absenteeism due to dysmenorrhoea.

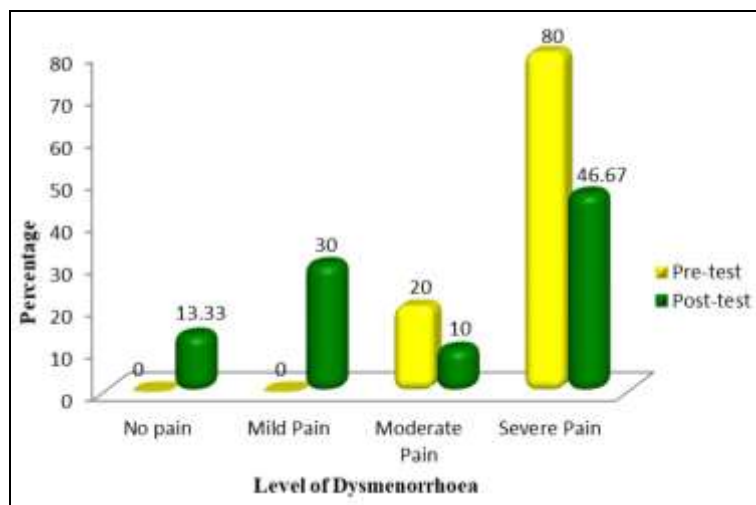


Fig 1: Assessment of Pre-test and Post-test Level of Dysmenorrhoea among Adolescent Girls in Experimental Group

Figure –1 showed that, majority 80% of adolescent girls had severe pain, 30% had mild pain, 13.33% had no pain and none of them had mild pain and no pain in pre-test. In post-test, 46.67% had

severe pain, 10% had moderate pain and 13.33% had no pain in experimental group.

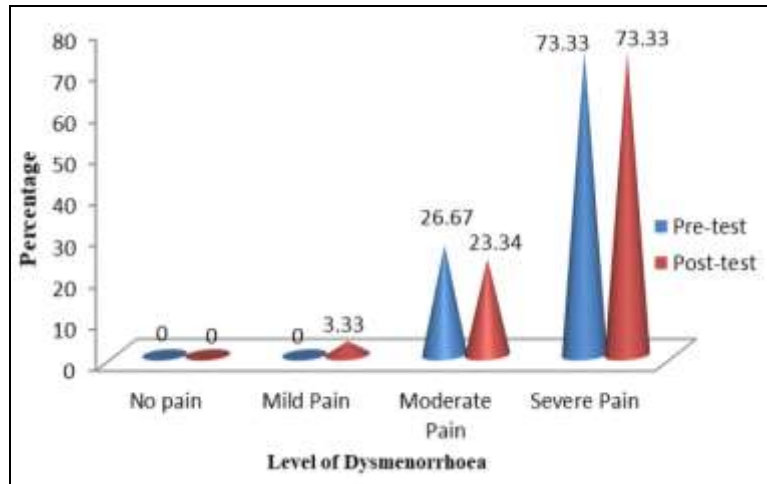


Fig 2: Assessment of Pre-test and Post-test Level of Dysmenorrhoea among Adolescent Girls in Control Group

Figure – 2 showed that, 73.33% of adolescent girls had severe pain, 26.67% had moderate pain and none of them had mild pain and no pain in pre-test. In post-test, 73.33%

had severe pain, 23.34% had moderate pain, 3.33% had mild pain and none of them had no pain in control group.

Table 3: Mean, Standard Deviation, Mean Difference, ‘t’ Value and P Value on Dysmenorrhoea among Adolescent Girls in Experimental and Control Groups

Group	Pre-test		Post-test		Mean Difference	Paired ‘t’ Value	P Value
	Mean	SD	Mean	SD			
Experimental group	75.67	13.085	45.33	27.17	30.34	5.511	0.0001*
Control group	75.33	14.079	70.33	17.221	5	1.231	0.2232

* Significant at 0.05 level

Table – 3 revealed that, the pre-test mean score of dysmenorrhoea was 75.67±13.085 and the post-test mean score was 45.33±27.17. The mean difference was 30.34 and the paired ‘t’ value was 5.511. The obtained ‘t’ value was higher than the table value in experimental group. Hence, it was highly significant at 0.05 level.

In control group, the pre-test mean mean score of dysmenorrhoea was 75.33±14.079 and the post-test mean score was 70.33±17.221. The mean difference was 5 and the paired ‘t’ value was 1.231. The obtained ‘t’ value was lower than the table value. Hence, it was not significant at 0.05 level.

Table 4: Association between Pre-test Level of Dysmenorrhoea and Selected Demographic Variables in Experimental Group (n=30)

Demographic Variables	Above Mean	Below Mean	χ ²	P Value
Age			0.009	0.922
18 - 19 years	15	13		
19 – 20 years	1	1		
Religion			0.016	0.992
Christian	9	8		
Hindu	6	5		
Muslim	1	1		
Type of Family			0.429	0.513
Nuclear	14	11		
Joint	2	3		
Place of Residence			1.429	0.232
Urban	8	4		
Rural	8	10		
Family Monthly Income			1.297	0.523
Below Rs. 10,000	5	6		
Rs. 10,001 – 20,000	10	6		
Above Rs. 20,000	1	2		
Dietary Habit			0.23	0.625
Vegetarian	2	1		
Non vegetarian	14	13		
Source of Health Awareness			1.217	0.749
Mass media	2	2		
Education	8	9		
Medical personnel	5	2		
Friends	1	1		

Table – 4 depicted that, there was no significant association between the pre-test level of dysmenorrhoea and age ($\chi^2=0.009$), religion ($\chi^2=0.016$), type of family ($\chi^2=0.429$),

place of residence ($\chi^2=1.429$), family monthly income ($\chi^2=1.297$), dietary habit ($\chi^2=0.23$) and source of health awareness ($\chi^2=1.217$) in experimental group.

Table 5: Association between Pre-test Level of Dysmenorrhoea and Selected Demographic Variables in Control Group (n=30)

Demographic Variables	Above Mean	Below Mean	χ^2	P Value
Age			1.296	0.255
18 - 19 years	14	7		
19 – 20 years	4	5		
Religion			0.648	0.723
Christian	10	8		
Hindu	7	3		
Muslim	1	1		
Type of Family			1	0.317
Nuclear	14	11		
Joint	4	1		
Place of Residence			6.914	0.008*
Urban	10	1		
Rural	8	11		
Family Monthly Income			0.629	0.73
Below Rs. 10,000	5	5		
Rs. 10,001 – 20,000	11	6		
Above Rs. 20,000	2	1		
Dietary Habit			0.089	0.765
Vegetarian	1	1		
Non vegetarian	17	11		
Source of Health Awareness			0.226	0.973
Mass media	2	1		
Education	9	7		
Medical personnel	5	3		
Friends	2	1		

*Significant at 0.05 level

Table – 5 inferred that, there was a significant association between the pre-test level of dysmenorrhoea and place of residence ($\chi^2=6.914$) and there was no significant association between the pre-test level of dysmenorrhoea and

age ($\chi^2=1.296$), religion ($\chi^2=0.648$), type of family ($\chi^2=1$), family monthly income ($\chi^2=0.629$), dietary habit ($\chi^2=0.089$) and source of health awareness ($\chi^2=0.226$) in control group.

Table 6: Association between Pre-test Level of Dysmenorrhoea and Selected Clinical Variables in Experimental Group *Significant at 0.05 level

Clinical Variables	Above Mean	Below Mean	χ^2	P Value
Age at Menarche			0.662	0.718
Below 9 years	2	1		
10 – 12 years	8	9		
13 – 15 years	5	4		
Above 15 years	1	0		
Weight			2.819	0.42
Below 40 kg	2	1		
41 – 45 kg	4	1		
46 – 50 kg	8	11		
Above 50 kg	2	1		
Menstrual Pain Onset			0.021	0.9
1–2 days before menstruation	1	1		
First day of menstruation	14	12		
Second day of menstruation	1	1		
Pattern of Menstrual Cycle			0.241	0.886
21 – 25 days	1	1		
26 – 30 days	13	12		
31 – 35 days	2	1		
Duration of Menstruation			0.402	0.818
1 – 3 days	2	1		
4 – 6 days	11	11		
More than 6 days	3	2		
Family History of Dysmenorrhoea			5.662	0.173*
Yes	7	12		
No	9	2		

College Absenteeism due to Dysmenorrhoea			8.57	0.003*
Yes	4	11		
No	12	3		

Table – 6 depicted that, there was a significant association between the pre-test level of dysmenorrhoea and family history of dysmenorrhoea ($\chi^2=5.662$) and college absenteeism due to dysmenorrhoea ($\chi^2=8.57$). There was no significant association between the pre-test level of

dysmenorrhoea and age at menarche ($\chi^2=0.662$), weight ($\chi^2=2.819$), menstrual pain onset ($\chi^2=0.021$), pattern of menstrual cycle ($\chi^2=0.241$) and duration of menstruation ($\chi^2=0.402$) in experimental group.

Table 7: Association between Pre-test Level of Dysmenorrhoea and Selected Clinical Variables in Control Group

Clinical Variables	Above Mean	Below Mean	χ^2	P Value
Age at Menarche			0.063	0.969
Below 9 years	2	1		
10 – 12 years	13	9		
13 – 15 years	2	2		
Above 15 years	1	0		
Weight			3.37	0.338
Below 40 kg	2	1		
41 – 45 kg	10	3		
46 – 50 kg	5	7		
Above 50 kg	1	1		
Menstrual Pain Onset			2.222	0.329
1 – 2 days before menstruation	1	2		
First day of menstruation	16	8		
Second day of menstruation	1	2		
Pattern of Menstrual Cycle			0.063	0.969
21 – 25 days	3	2		
26 – 30 days	13	9		
31 – 35 days	2	1		
Duration of Menstruation			1.031	0.597
1 – 3 days	4	2		
4 – 6 days	13	8		
More than 6 days	1	2		
Family History of Dysmenorrhoea			4.47	0.034*
Yes	10	11		
No	8	1		
College Absenteeism due to Dysmenorrhoea			1.875	0.17
Yes	9	9		
No	9	3		

*Significant at 0.05 level

Table – 7 depicted that, there was a significant association between the pre-test level of dysmenorrhoea and family history of dysmenorrhoea ($\chi^2=4.47$). There was no significant association between the pre-test level of dysmenorrhoea and age at menarche ($\chi^2=0.063$), weight ($\chi^2=3.37$), menstrual pain onset ($\chi^2=2.222$), pattern of menstrual cycle ($\chi^2=0.063$), duration of menstruation ($\chi^2=1.031$) and college absenteeism due to dysmenorrhoea ($\chi^2=1.875$) in control group.

Discussion

The first objective of the study was to assess the pre-test and post-test level of dysmenorrhoea among adolescent girls in experimental and control group

- In pre-test, majority 80% of adolescent girls had severe pain 20% had moderate pain and none of them had mild pain and no pain. In post-test, 46.67% had severe pain, 30% had mild pain, 13.33% had no pain and 10% had moderate pain in experimental group.
- Among 30 adolescent girls, 73.33% of adolescent girls had severe pain, 26.67% had moderate pain and none of them had mild pain and no pain in pre-test. In post-test, 73.33% had severe pain, 23.34% had moderate pain,

3.33% had mild pain and none of them had no pain in control group.

The above finding would be compared with the study done by Kapoor, J. (2017) on “A study to assess the effectiveness of pelvic rocking exercise on dysmenorrhoea among adolescent girls”. Sixty samples were selected by purposive sampling technique. Socio-demographic profile and standardized numerical (0-10) pain intensity rating scale was used to assess the dysmenorrhoea among adolescent girls. The analysis of data revealed that 41.7% had severe pain, 45% had moderate pain, 13.3% had mild pin and none of them had no pain [7].

The second objective of the study was to find out the effectiveness of pelvic rocking exercise on dysmenorrhoea among adolescent girls in experimental and control group. The corresponding hypothesis (H₁) - there will be a significant difference between pre-test and post-test mean scores of dysmenorrhoea among adolescent girls in experimental and control group.

- In experimental group, the pre-test mean score of dysmenorrhoea was 75.67±13.085 and the post-test mean score was 45.33±27.17. The mean difference was

30.34 and the paired 't' value was 5.511. The obtained 't' value was higher than the table value. Hence, it was highly significant at 0.05 level.

- In control group, the pre-test mean score of dysmenorrhoea was 75.33 ± 14.079 and the post-test mean score was 70.33 ± 17.221 . The mean difference was 5 and the paired 't' value was 1.231. The obtained 't' value was lower than the table value. Hence, it was not significant at 0.05 level.

Hence, the hypothesis (H₁) - there will be a significant difference between pre-test and post-test mean scores of dysmenorrhoea among adolescent girls in experimental and control group was partially accepted.

A similar study done by Ghareeb, O. H. El-Bandrawy, M. A. and El-Refaye, E. G. (2014) done a study on "Effect of aerobic combined with pelvic rocking exercises on quality of life in primary dysmenorrhoea". A randomized controlled trial design was used for the purposes of the study. Sixty samples of primary dysmenorrhoea were selected for this study. The pre-test mean value was 70.38 ± 8.13 and the post-test mean value was 81.26 ± 11.34 . The percentage of improvement was 13.4%. Hence, it was statistically highly significant increase ($p < 0.0001$) in quality of life [16].

The third objective of the study was to associate the pre-test level of dysmenorrhoea with selected demographic variables among adolescent girls in experimental and control group

The corresponding hypothesis (H₂) - there will be a significant association between pre-test level of dysmenorrhoea and selected demographic variables among adolescent girls in experimental and control group.

- In experimental group, there was no significant association between the pre-test level of dysmenorrhoea and age ($\chi^2=0.009$), religion ($\chi^2=0.016$), type of family ($\chi^2=0.429$), place of residence ($\chi^2=1.429$), family monthly income ($\chi^2=1.297$), dietary habit ($\chi^2=0.23$) and source of health awareness ($\chi^2=1.217$) of adolescent girls.
- In control group, there was a significant association between the pre-test level of dysmenorrhoea and place of residence ($\chi^2=6.914$) and there was no significant association between the pre-test level of dysmenorrhoea and age ($\chi^2=1.296$), religion ($\chi^2=0.648$), type of family ($\chi^2=1$), family monthly income ($\chi^2=0.629$), dietary habit ($\chi^2=0.089$) and source of health awareness ($\chi^2=0.226$).

Hence, the hypothesis (H₂) - there will be a significant association between pre-test level of dysmenorrhoea and selected demographic variables among adolescent girls in experimental and control group was rejected except with regard to place of residence in control group.

The study finding would be compared with the study done by Sheet, S. (2015) conduct a study on "A pre experimental study to assess the effectiveness of pelvic floor exercise on reducing the pain and discomfort of dysmenorrhoea among nursing students in selected nursing college, Raigarh, Chhattisgarh". Pre experimental one group pre-test post-test design was adopted in this study. 60 samples were selected. The sampling technique was non probability purposive sampling. The study concluded that, there is no significant association between discomfort of dysmenorrhoea and age ($\chi^2=5.65$), year of course ($\chi^2=0$), family income ($\chi^2=5.99$), age at menarche ($\chi^2=1.10$), duration of menstruation

($\chi^2=1.38$), interval of menstruation ($\chi^2=1.09$) and sources of information ($\chi^2=0.16$) [17].

The fourth objective of the study was to associate the pre-test level of dysmenorrhoea with selected clinical variables among adolescent girls in experimental and control group

The corresponding hypothesis (H₃) - there will be a significant association between pre-test level of dysmenorrhoea and selected clinical variables among adolescent girls in experimental and control group.

- In experimental group, there was a significant association between the pre-test level of dysmenorrhoea and family history of dysmenorrhoea ($\chi^2=5.662$) and college absenteeism due to dysmenorrhoea ($\chi^2=8.57$). There was no significant association between the pre-test level of dysmenorrhoea and age at menarche ($\chi^2=0.662$), weight ($\chi^2=2.819$), menstrual pain onset ($\chi^2=0.021$), pattern of menstrual cycle ($\chi^2=0.241$) and duration of menstruation ($\chi^2=0.402$).
- In control group, there was a significant association between the pre-test level of dysmenorrhoea and family history of dysmenorrhoea ($\chi^2=4.47$). There was no significant association between the pre-test level of dysmenorrhoea and age at menarche ($\chi^2=0.063$), weight ($\chi^2=3.37$), menstrual pain onset ($\chi^2=2.222$), pattern of menstrual cycle ($\chi^2=0.063$), duration of menstruation ($\chi^2=1.031$) and college absenteeism due to dysmenorrhoea ($\chi^2=1.875$).

Hence, the hypothesis (H₃) - there will be a significant association between pre-test level of dysmenorrhoea and selected clinical variables among adolescent girls in experimental and control group was partially accepted.

A similar study done by Jiji, C. (2012) "Effectiveness of pelvic rocking exercise on dysmenorrhoea among adolescent girls aged 15 - 20 years residing in selected villages at Kanyakumari District". The design adopted for the study was true experimental pre and post-test control group design. Simple random sampling technique was adopted for this study. Sixty adolescent girls were selected. The study revealed that, there was no association between age ($\chi^2=0.855$), age at menarche ($\chi^2=5.432$), family income ($\chi^2=10.124$) and religion ($\chi^2=2.023$) [18].

Implications of the Study Nursing Administration

Nurse administrators can provide an opportunity for nurses to attend pelvic rocking exercise training programme to teach adolescent girls in reduction of dysmenorrhoea. Nurse administrators can conduct in-service education programme on effective management of dysmenorrhoea by providing pelvic rocking exercise. The nursing administrators must have an in-depth knowledge about the steps of pelvic rocking exercise and its effect on dysmenorrhoea.

Nursing Education

Nursing curriculum should concentrate in alternative therapies for dysmenorrhoea which can be incorporated with routine practices. Nurse educators should evaluate their student's level of dysmenorrhoea periodically and encourage them to do pelvic rocking exercise regularly. Workshops, lectures and discussion programmes can be arranged in schools and colleges to motivate the students for practicing pelvic rocking exercise regularly.

Nursing Research

Extensive research must be conducted on pelvic rocking exercise among adolescent girls. The study findings will encourage further research studies on the effectiveness of pelvic rocking exercise to reduce dysmenorrhoea among adolescent girls. Nurse researchers have to develop newer tool to determine dysmenorrhoea levels among adolescent girls. This finding of the study can be baseline for the future studies to build on.

Nursing Practice

The nurse can teach the benefits of pelvic rocking exercise to reduce dysmenorrhoea among adolescent girls in clinical and community settings. Workshops, lectures and discussion programmes can be arranged in sub centre and primary health centre for educating the adolescent girls on reduction of dysmenorrhoea. The community health nurse has a key role to provide effective nursing care for improvement of the health status in reducing the level of dysmenorrhoea among adolescent girls.

Recommendations for Further Research

Based on the findings, the researcher proposed several recommendations for further studies. A similar study can be done in community setting. A descriptive study can be conducted to assess the level of dysmenorrhoea among adolescent girls with larger population. A similar study can be done with true experimental research design. A comparative study can be carried out among adolescent girls in rural and urban area. A similar study can be done in reproductive age women with larger samples. The effectiveness of pelvic rocking exercise can be tested for other conditions like low back pain and incontinence of urine. A similar study can be undertaken on larger samples for better generalizations of findings.

Conclusion

Pelvic Rocking Exercise is a physical exercise that can be used to reduce dysmenorrhoea by strengthening the abdominal muscles and smoothing the blood circulation. The present study concluded that, pelvic rocking exercise helps to reduce the level of dysmenorrhoea among adolescent girls. The overall experience of conducting the study is a novel experience for the researcher in the field of nursing research.

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