IOSR Journal of Nursing and Health Science (IOSR-JNHS)
e-ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 5, Issue 2 Ver. IV (Mar. - Apr. 2016), PP 10-17
www.iosrjournals.org

Effect of Home based Stretching Exercises and Menstrual Care on Primary Dysmenorrhea and Premenstrual Symptoms among Adolescent Girls

Reda Mohamed-Nabil Aboushady[1]& Tawheda Mohamed Khalefa El-saidy[2]
[1]*Lecturer of Maternal and Newborn Health Nursing, Faculty of Nursing, Cairo University, Egypt.*
[2]*Lecturer of Community Health Nursing, Faculty of Nursing, Menoufia University, Egypt.*

Abstract
Background: *Dysmenorrhea is a painful menstruation. It can influence on females daily life activities and productivity. Stretching exercises and menstrual care have been advocated to reduce the pain of primary dysmenorrhea.*
The aim of the study *was to evaluate the effect of practicing home based stretching exercises and menstrual care on reducing pain intensity of primary dysmenorrhea and premenstrual symptoms for the adolescent girls.*
Design*: A quasi – experimental design was utilized for the current study.*
Setting: *The study was conducted at two secondary schools and one college at Shaqra city, Kingdom of Saudi Arabia.* ***Sample****: A total of 80 dysmenorrheal students were recruited in the study. They randomly assigned into two groups (40 for each).* ***Three tools were used to collect data****; (1) Adolescent girls structured interviewing questionnaire, (2) menstruation assessment questionnaire, and (3) Visual analogue scale (VAS).*
Results: *The mean age of the studied sample was 18.1 ± 2.34 years old. 53.8 % of the girls suffered from moderate dysmenorrhea and 25.0% of them had severe dysmenorrhea. Also, pain score before menstruation, one day after menstruation, and two days after menstruation were significantly reduced from the pretest to posttest (p< 0.001*). The most reported premenstrual symptoms that reduced include fatigue (50.0% pre, 25.0% post), headache (35.0% pre, 20.0% post), mood changes (67.5% pre, 25.0% post), constipation (10.0% pre, 7.5% post), and excessive sweating (10.0% pre, 7.5 % post). The pain intensity (severe dysmenorrhea) for the studied group reduced from 37.5% during the pretest to 12.5 % during the posttest.*
Conclusion: *Using* owt *months regular stretching exercises combined with the usual menstrual care were effective for reducing the pain intensity of primary dysmenorrhea and premenstrual symptoms.*
Recommendations: *Nurses should provide health educational sessions to the adolescent girls about menstruation, the usual menstrual care, and the importance of practicing the stretching exercises to reduce dysmenorrhea and premenstrual symptoms. Also, secondary school curricula should contain topics about dysmenorrhea and methods of management.*
Keywords: *Stretching Exercises, Menstrual care, Primary Dysmenorrhea, Premenstrual Symptoms, Adolescent girls.*

I. Introduction

Adolescence is a critical developmental period usually understood as the years between onset of puberty and the creation of social independence. (1) It is the age of transition from childhood to adulthood and is characterized by a spurt in physical, endocrinal, emotional, and mental growth with a conversion from complete dependence to relative independence. (2) Also, adolescence is the age of 11-21 years old. (3) There is no doubt that yesterday girl is today's adolescent and tomorrow's mother. Approximately 9% of the world's population is in the age group of 10-19 years, as they are passing through a transitional period from childhood to adulthood, they are experiencing physical as well as psychological stress due to the changes taking place in the body. (4) The Saudi Arabia Demographics Profile, (5) reported that the age from 10-14 years constituted about 27.6% (male 3,869,961/female 3,681,616). While, the age category from 15-24 years constituted about 19.3% (male 2,832,538/female 2,458,339).

One of the major physiological changes that occur in adolescent girl's life is the onset of menarche, which is often associated with problems of irregular menstruation, excessive bleeding, and dysmenorrhea. Dysmenorrhea is one of the most common problems experienced by adolescent girls. (2) Pain associated with menstruation is recognized as dysmenorrhea. It is a difficult menstrual flow or painful menstruation. (6) It can be divided into primary and secondary dysmenorrhea. Primary dysmenorrhea is a cramping pain in the lower abdomen occurring just before or during menstruation, when pelvic examination and ovulatory function are normal. While, secondary dysmenorrhea is a menstrual cramp associated with underlying pathology, and its onset may be years after menarche. It is associated with pathogenic disorders such as endometriosis, pelvic inflammatory disease, intra-uterine devices, irregular cycles or infertility problems, ovarian cysts, polyps, intra-uterine adhesions, or cervical stenosis. (7,8)

The experience of pain with menstruation is common for 70–91% of teenagers. (9) Several studied mentioned that before menstruation begins approximately 2–4 days, prostaglandins proceed into the uterine muscle where they build up quickly at menstrual onset and act as smooth muscle contractors that aid in the expulsion of the endometrium. (7) The prevalence of dysmenorrhea worldwide ranges 15.8 - 89.5%, with higher prevalence rates reported in the adolescent population. (6) Dysmenorrhea is the most common gynecological disorder affecting more than half of menstruating women worldwide. (10,11) It was the most prevalent (93 %) menstrual disorder, followed by premenstrual symptoms (65 %), and abnormal cycle lengths (43 %)**.** Menstrual disorders hindered with the social and academic life of 33% and 7.7 % of respondents respectively. (12) Dysmenorrhea is found to be highly prevalent among college going girls. It was reported in 84.2% of the studied girls and 15.8% of them reported no dysmenorrhea. Using visual analog scale, 34.2% of girls experienced severe pain, 36.6% moderate and 29.2% of them had mild pain. (13) So, the researchers and healthcare providers should consider primary dysmenorrhea as a highly prevalent gynecological complaint and intervention studies should give attention on methods of reducing the intensity as well as the prevalence of primary dysmenorrhea in young female students. (14)

Dysmenorrhea is a common menstrual disorder experienced by adolescents and its major symptom including pain adversely affect daily life and school performance. (15) Pain or cramping sensations in the lower abdomen may be accompanied by headache, dizziness, diarrhea, a bloated feeling, nausea and vomiting, backache, and leg pains. (16, 17&18) These symptoms are reported to be the most common causes for adolescents visiting the physician and are thus a major public health problem. (18) Menstrual cramps are made worse by stress; exercise is a well-known natural way to lower the level of stress and menstrual cramp. (19)

Worldwide there is a wide range of strategies for management of dysmenorrhea. (11) A pharmacological and non-pharmacological strategy was used for managing premenstrual symptoms. Good menstrual hygiene is essential for the health and dignity of girls. Equipping adolescent girls with adequate information and skills about menstrual hygiene and its management helps in empowering them with knowledge which enhances their self-esteem and positively impacts their academic performance. Nurses should provide counseling and support to adolescent girls on how to improve their diets; weekly iron and folic acid supplementation. (20) Also, nurses can play an active role

in pain management through posing comfort measures and reassurance to relief pain. Their role includes as well, offering therapies for symptoms relief, checking safety or side effects of these therapies and refer female students to a physician if severe symptoms such as intense pain or vomiting occur regularly for 3 months or more. [21] Self-care practices as well as menstrual hygiene are basic requirements for promoting a satisfied life and personal esteem in a woman. [22]

The scientific evidence mentioned that, exercises considered another strategy for reducing the dysmenorrhea. It can help to relieve menstrual cramps in a few ways. It increases blood circulation, which helps cramps to go away. [19] Stretching exercises are one of the non-pharmacological methods for management of primary dysmenorrhea. [23, 24] Also, Change, [25] reported that women who have premenstrual symptoms are often encouraged to increase their activity level. It has been hypothesized that exercise increases endorphin levels, which in turn improves mood and quality of life. Descriptive studies indicate that women who exercise regularly have fewer premenstrual symptoms than sedentary women. One randomized controlled unblinded trial involving 23 women found that women randomized to an aerobic exercise group reported fewer premenstrual symptoms after three cycles than women who were in a nonaerobic exercise group. [26] A recent study stated that both aerobic and stretching exercises were effective in reducing the severity of dysmenorrhea. Therefore, women could choose one of these two methods with regard to their interest and lifestyle. [27] According to Saleh and his colleagues [28] added that, active stretching or core strengthening exercises seem to be an easy, non-pharmacological method for managing primary dysmenorrhea. It reduces pain intensity and duration of primary dysmenorrhea. So, these can be safely used as a non-pharmacological method for pain relief in primary dysmenorrhea. [28]

Significance of the study

Dysmenorrhea refers to painful menstruation in the absence of an identifiable pathological condition. [29] It is the most common gynecologic disorder among the female adolescents that affects more than half of women of 18-25 years old. [28, 30] The incidence of primary dysmenorrhea was reported to be between 20% and 90% in different communities. [28] It refers to the painful cramps in the lower abdomen and associated with one or more symptoms as; sweating, lower backache, fatigue, diarrhea, headache, nausea, vomiting, and dizziness. It is one of the leading causes of the females' recurrent short-term absenteeism in schools and workplaces. [30] Self-care practices as well as menstrual hygiene are basic requirements for promoting a satisfied life and personal esteem in a woman. [22] It is essential for the health and dignity of girls. So, equipping adolescent girls with adequate information and skills on menstrual care helps in empowering them with knowledge which enhances their self-esteem and positively impacts their academic performance. [20] Added to that, exercises can reduce the primary dysmenorrhea and associated symptoms. Home-based exercises recommended as an effective intervention and seemed to provide a significant improvement in pain intensity of primary dysmenorrhea. [29, 31] It has an analgesic effect. [28] Exercises also stimulate the production of endorphins, which act as the body's natural painkillers. Generally stretching the abdominal muscles can help to ease the period cramps. [32] So, the current study focuses on evaluating the effect of practicing home based stretching exercises and menstrual care on reducing pain intensity of primary dysmenorrhea and premenstrual symptoms for the adolescent girls.

II. Aim of the study

The aim of the current study was

1- To evaluate the effect of practicing home based stretching exercises and menstrual care on reducing pain intensity of primary dysmenorrhea.
2- To reduce premenstrual symptoms for the adolescent girls.

I. Research Hypothesis

To fulfill the aims of the current study the following research hypotheses are formulated

H1. Adolescent girls who will practicing home based stretching exercises and menstrual care will have a reduction in pain intensity during menstruation as compared to those who don't.
H2. The stretching exercises and menstrual care will reduce the premenstrual symptoms for the studied group.

III. Subjects and Methods

Research design

Quasi-experimental research design with pre- posttest was used to evaluate the effect of practicing home based stretching exercises and menstrual care on reducing pain intensity of primary dysmenorrhea and premenstrual symptoms for the adolescent girls. This design is one type of the quasi-experimental designs in which data collected from research subjects both before and after introducing the intervention. [33]

Setting

The study was conducted at the first and second secondary schools and college of applied medical science at Shaqra city, Kingdom of Saudi Arabia.

Sample

A Purposive sample of 80 girls was used for this study. They randomly assigned into two groups. The control group who practiced the usual menstrual care only consists of 40 adolescent females, and the study group (40 students) who practiced regularly the home based stretching exercises for 8 weeks combined with the usual menstrual care. The researchers selected the adolescent girls who met the following inclusion criteria include; single girl, age from 16-21 years old, suffered from primary dysmenorrhea, and didn't have any history of gynecological disease, has a regular menstrual cycle length 28-30 day, and cycle bleed from 3 to 7 days. While, female under hormonal therapy, and who had secondary dysmenorrhea were excluded from the current study.

Tools for data collection: three tools were used to collect data from the adolescent girls and included the following;

1). Adolescent girls structured interviewing questionnaire: this tool was developed and used by the researchers after extensive literature review and it included the personal data as; age, residence, socioeconomic level, weight, and height.

2). Menstruation assessment questionnaire: this tool was developed and used by the researchers after extensive literature review and it included two parts: ***the first part*** contained questions related to age of menarche, duration of menstruation, menstrual interval, the number of pads, premenstrual symptoms such as poor concentration, mood sewing, irritability, fatigue, frequent urination, headache, and constipation. As well, ***the second part*** contained data related to personal habits for relieving menstrual pain.

3). Visual Analogue Scale: Visual analogue scale (VAS) is simple to use but it requires that the student be able to conceptualize pain in this assessment tool. [34] The visual analogue scale is adopted from Gift, [35] and consisted of a blank line anchored at each end of the line by adjectives that describe the extremes of pain. For ease of measurement a 10 cm line usually is used. The anchoring adjectives commonly used are "no pain "and "severe pain" (worst possible pain). The adolescent female is asked to place a mark on the line that

best indicates the pain being experienced. Measuring from the end of the line to mark made by the female gives a numeric rating of the intensity of the pain. Scoring: the score zero (0) indicates no pain and the top score (10) indicates the worst possible pain. The VAS was divided into 3 mains parts: the first part graded from 1-3 cm which reflects mild pain, the second part graded from 4-7 cm for moderate pain and the third part graded from 8-10cm for severe pain.

Validity and reliability of the tools

The tools were developed by the researchers after reviewing the related literature and tested for its content validity. Validity indicated the degree to which the tool measures what it is expected to measure. Therefore, in this study, questionnaires content validity was determined by four experts in maternity health nursing and community health nursing. Then the necessary modifications were done. Reliability of the tool was measured for testing the internal consistency of the tools by administrating the same tools to the same subjects under the similar condition on one or more occasion (test-retest reliability).

Pilot study

A pilot study was conducted on 10 % of the sample that was not used for the final study to ensure clarity of the questions and then modifications were done and to test the research feasibility, clarity, and objectivity of the tools as well to estimate the time needed for data collection. Based on its result the changes were carried out. The sample included in the pilot study was excluded from the study sample.

Procedure

Before conducting the study, permission was obtained from the administrators of the two secondary schools and college of applied medical science personnel after that, acceptance of the students who were participated in the study was obtained. Data collection procedure has been done through three phases; **assessment and interviewing, implementation, and evaluation phase**.

***Assessment and interviewing phase*:** During the assessment phase, all students who met the inclusion criteria were interviewed individually for clarifying the purpose of the study. Data collected over a period of 6 months from beginning of January 2015 to the end of June of 2015 at two secondary schools and the College of Applied Medical Sciences at Shaqra University, Kingdom Saudi Arabia three days per week and one day interval. Each student was interviewed to collect the personal data which included age, educational level, residence, height, weight, and telephone number. This interview took about 15-20 minutes with each female student. The baseline data were collected from both groups.

***Implementation phase*:** During the implementation phase, the researchers conducted of the planned instructional sessions for the 80 female students. The selected adolescent girls were randomly assigned into two groups. The intervention group comprised of 40 adolescent girls who were encouraged to practice the stretching exercises and nursing instructions about the usual menstrual care. The control group comprised of 40 adolescent girls who were encouraged to follow the usual menstrual care only.

The study group comprised of 40 adolescent girls who were encouraged to practice the stretching exercises and nursing instructions about the usual menstrual care. They were interviewed for the nursing instructions as small groups with an average number of 5-10 students attending the instructional and practical sessions. The nursing instructions contained two instructional sessions per week for each group, and one day interval between each session, every session consumed about 30-45 minutes and extra time allowed for the students for asking any question or clarification related to the sessions. The investigators used a power point presentations and video during the explanation to grasp the student's attention. After that, the female students were asked to practice the stretching exercises for 8 weeks at home (3 days per week and 2 times per day for 20-30 minutes).

The first instructional session: the researchers gave a brief discussion about menstruation and hormonal changes during adolescent phase by using a power point presentation, pictures, and video to help of understanding the topics. As well, gave the students the following instructions regarding the usual menstrual care that included: use sanitary napkins, always wash hands before put in new napkins to prevent infection, wash hands after changing the pads, and change the pad every 3 to 4 hours to keep the blood from soaking through the clothes. Also, it is very important to maintain good hygiene during the period to avoid vaginal and urinary tract infections. Sanitary pads can cause some irritation on the inner thighs. So, the genitals should be kept clean and dry. Wash the genital area with plain water (no soap) after each use of the toilet. Don't wear a panty with loose elastic. Good elastic secures the pad and the panty in place. Take a warm water bath twice a day during the menses or at least once a day to stay fresh and healthy. Also, rest, exercise, eat healthy foods, eat lots of fruits and vegetables, limit the caffeinated fluids, and drink at least 8-10 glasses of water. At the end of the first session, the researcher's handout the booklet for each student with clears Arabic language.

***The second session*:** the researchers started the session by welcoming the students and revising the content of the first session and start the second session which contained the following: five types of stretching exercises in the abdominal, pelvic, and groin regions. The female students were asked to practice the active stretching exercises for 8 weeks at home (3 days per week and 2 times per day for 20-30 minutes). Furthermore, they were asked to avoid performing the stretching exercises during the menstrual cycle. The correct techniques of acting the stretching exercises were explained and practiced first by the researchers in front of them, by using the computer and colored handouts.

In the current study, the researcher was selected only five types of exercises after extensive review to reduce pain intensity of primary dysmenorrheal and premenstrual symptoms for the adolescent girls. [28, 49] ***the first stretching exercise***: the student was asked to stand behind a chair, bend trunk forward from the hip joint so that the shoulders and back were positioned on a straight line and the upper body was placed parallel to the floor. Duration of holding time was 5 seconds; repetition was 10 times (Figure 1).

The second stretching exercise: the student was 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 was performed 20 times (Figure 2).

The third exercise: the student was asked to spread her feet wider than shoulder width. Then the student was asked to touch left ankle with her right hand while putting her left hand in a stretched position above her head so that, the head was in the middle and her head was turned and looked for her left hand. This exercise was repeated for the opposite foot with the same method. The exercise was repeated alternatively 10 times for each side of the body (Figure 3).

The fourth exercise: the student was asked to lie down in the supine position so that the shoulders, back, and feet were kept on the floor. In this position, the knees were bent with the help of her hands and reached to her chin. The repetition frequency was 10 times (Figure 4).

And ***the fifth exercise***: the student was 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 was contracted for 10 seconds. This exercise was repeated 10 times (Figure 5).

Fig (1) Fig (2) Fig (3) Fig (4) Fig (5)

The second group: the control group was comprised of 40 adolescent girls who were encouraged to do the usual menstrual care only. After 8 weeks, the researchers asked the second group to complete the posttest questionnaire. The researchers gave the booklet for each student in the control group after the 8 weeks with clear Arabic language.

Evaluation phase

All students were followed up for evaluating the effect of practicing the home based stretching exercises on reducing the intensity of the menstrual pain and the other premenstrual symptoms. Posttest was examined after 8 weeks for pain intensity, pain duration, and the use of sedative drugs for both groups. They were asked to avoid regular physical exercises during the menstruation.

Human rights and ethical considerations

The students were chosen according to the inclusion criteria and they were interviewed after their informed consent was obtained from the subjects who were willing to participate in the study. The participants were informed that participation in this study is voluntary; they can withdraw at any time from the study without giving reasons. The investigators explained the aim of the study to all girls in the study sample. They reassured that any obtained information would be strictly confidential.

Statistical Analysis: Statistical package for the social science (SPSS) version 20 was used for statistical analysis of data, as it contains the test of significance given in standard statistical books. Collected data were summarized and tabulated by using descriptive statistics. Parametric inferential statistics (independent sample t-test, paired sample t- test & chi- square test) was used to examine the differences and similarities. The level of significance was set at $p < 0.05$.

IV. Results

A total of 80 female students were recruited into the present study. Their demographic data were presented in (table, 1). It shows that the mean age of the studied adolescent girls was 18.1 ± 2.34 years old. Regarding the place of residence, 92.25% of the control group versus 90% of the study group was lived in an urban area. Fifty percent in both groups had a middle socioeconomic status. As regards to the body mass index, the table reveals that 46.2% of the sample had a normal body weight, and 38.7% of them had overweight and obesity.

Regarding the characteristics of menstruation for the two groups, table (2) illustrates that the age of menarche for the sample was about 13 years old (12.55± 2.08) for the control group compared to 13.22±1.16 years old for the study group. Regarding the number of pads, this table shows that 70% of the study group compared to 52.5% in the control group used about 3 pads per day during the menstruation.

As concerning the premenstrual symptoms, 61.2 % of the participants mentioned that fatigue is the most physical premenstrual symptom. Also, more than one-third (38.8 %) of the students had a headache, constipation (16.2 %), and excessive sweating (12.5%) (Table, 3). As regards to the psychological premenstrual symptoms, more than two-thirds of the girls (71.2%) suffered from mood changes (sadness and restlessness) and 51.2% of them had nervousness before menstruation.

Table (4) shows that more than half of the sample (50.0%, 57.5%) suffered from moderate dysmenorrhea and one-quarter of them (25.0%) had severe dysmenorrhea. As regards to the site of pain, more than one-third of the participants (41.2%) had abdominal pain while 26.2% of them suffered from pain in the suprapubic area. This pain generally still most time of the month for 12.7% of them and occurred sometimes for about two-thirds of the adolescent girls.

Table (5) reveals that pain score before menstruation, one day after menstruation, and two days after menstruation were significantly reduced from the pretest to posttest ($p< 0.001$*). Added to that, the premenstrual symptoms reduced after practicing the stretching exercises. The most reported premenstrual symptoms that reduced include fatigue (50.0% pre, 25.0% post), headache (35.0% pre, 20.0% post), mood changes (67.5% pre, 25.0% post), constipation (10.0% pre, 7.5% post), and excessive sweating (10.0% pre, 7.5 % post).

Figure (1) illustrates that the pain intensity (percentage of severe dysmenorrhea) for the studied group reduced from 37.5% during the pretest to 12.5 % during the posttest. Also, the percent of mild dysmenorrhea (30.0%) increased in a comparison to the percent measured during the pretest (12.5%). These results indicated that the stretching exercises beside the menstrual care can reduce the intensity of primary dysmenorrhea.

The pain duration and use of medications recorded in both groups before and after completion of the exercises presented in table (6). It was found that after practicing the exercises along eight weeks, pain duration and amount of consumed analgesic medications decreased significantly ($p<0.001$*) in the study group as compared to the control group. Also, pain duration during the menstrual days reduced significantly from the pretest (7.73± 0.67 hours) to the posttest (4.13± 0.69 hours).

Table (1) Distribution of Socio-demographic Characteristics of the Studied Sample.

Socio-demographic Characteristics	Study group (n = 40)		Control group (n = 40)		Total N=80	
Age (year)	No	%	No	%		
Mean + SD	17.67 ± 2.46		18.52 ± 2.16		16.9 ± 2.3	
Residence:						
Rural	3	7.5	13	32.5	16	20.0
Urban	37	92.5	27	67.5	64	80.0
Level of Education:						
Secondary	23	57.5	17	42.5	40	50.0
University	17	42.5	23	57.5	40	50.0
Socioeconomic level:						
Low	8	20.0	15	37.5	23	28.8
Middle	20	50.0	22	55.0	42	52.4
High	12	30.0	3	7.5	15	18.8
Weight(kg)	49.38 ±7.6		54.01 ±11.3		51.7± 9.9	
Height(cm)	154.5 ± 4.4		156.7 ± 5.1		155.6 ± 4.9	
BMI categories:						
Under weight	6	15.0	5	12.5	12	15.1
Normal weight	14	35.0	16	40.0	37	46.2
Over weight	10	25.0	10	25.0	13	16.2
Obese	10	25.0	9	22.5	18	22.5

Table (2): Distribution of Menstrual Characteristics for the Studied girls (n=80)

Menstrual characteristics	Study group (n=40)		Control group (n=40)		p. value
Age of menarche	No	%	No	%	
<13	13	35.5	18	45.0	P > 0.05
>13	27	67.5	22	55.0	
Mean + SD	13.22 +1.16		12.55 +2.08		
Duration of Menstruation					
3-5	9	22.5	2	5.0	P <0.05
>5	31	77.5	38	95.0	
Interval of Menstruation					
<28	37	92.5	35	87.5	P > 0.05
>28	3	7.5	5	12.5	
Rhythm of Menstruation					
Regular	29	72.5	31	52.5	P >0.05
Irregular	11	27.5	9	22.5	
Number of pads/dya					
>3	28	70.0	21	52.5	P > 0.05
3 and more	12	30.0	19	47.5	

Table (3): Distribution of Premenstrual Symptoms for the Two groups (n= 80)

Premenstrual symptoms	Study group (n=40)		Control group (n=40)		Total n=80	
Physical symptoms:						
Headache	15	35.0	17	42.5	31	38.8
Constipation	4	10.0	9	22.5	13	16.2
Diarrhea	3	7.5	4	10.0	7	8.8
Fatigue	20	50.0	29	72.5	49	61.2
Frequent urination	2	5.0	6	15.0	8	10.0
Excessive sweating	4	10.0	6	15.0	10	12.5
Psychological symptoms:						
Mood changes	27	67.5	30	75.0	57	71.2
Nervousness	19	47.5	22	55.0	41	51.2

Table (4) Distribution of Menstrual Pain Characteristics for the Sample (n= 80)

Pain characteristics	Study group (n=40)		Control group (n=40)		Total (n=80)	
Frequency of dysmenorrhea						
Always	3	7.5	6	15.0	9	11.25
Sometimes	26	65.0	27	67.5	53	66.25
Rarely	11	27.5	7	17.5	18	22.50
Severity of dysmenorrhea						
Mild	5	12.5	12	30.0	17	21.2
Moderate	20	50.0	23	57.5	43	53.8
Severe	15	37.5	5	12.5	20	25.0
Site of pain						
Abdomen	21	52.5	12	30.0	33	41.2
Lower back	6	15.0	9	22.5	15	18.8
Lower abdomen and back	1	2.5	10	25.0	11	13.8
Suprapubic area	12	30.0	9	22.5	21	26.2

Table (5) Pre and Post Mean Pain Score and Premenstrual Symptoms for the Study Group (n=40)

Pain score and premenstrual symptoms	Pre	Post	P – value
-Pain Score before menstruation	3.22 + 1.09	1.97 + 0.89	P < 0.001
-Pain score one day after menstruation	2.92 + 0.62	2.10 + 0.95	P < 0.001
-Pain score two days after menstruation	2.70 + 1.09	1.82 + 1.03	P < 0.001
Premenstrual symptoms:			
Physical symptoms			
Headache	15 35.0	8 20.0	P < 0.001
Constipation	4 10.0	3 7.5	
Diarrhea	3 7.5	0 0.0	
Fatigue	20 50.0	10 25.0	
Frequent urination	2 5.0	6 15.0	
Excessive sweating	4 10.0	3 7.5	
Psychological symptoms			
Mood changes	27 67.5	10 25.0	
Nervousness	19 47.5	0 0.0	

Figure (1): the Pre and Post Intensity of Menstrual Pain in the Studied Group

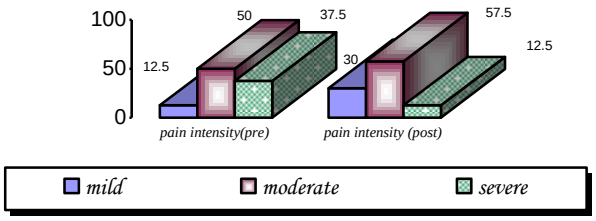

Table (6): Pain Duration and the Use of Analgesic Medications Recorded by the studied participants

Variables	Study group (n=40)		Control group (n=40)	
	Before	After	Before	After
Pain duration (h)	7.73± 0.67	4.13± 0.69	6.92± 1.12	6.07 ± 1.64
Use of medication(n)	1.33± 0.94	0.56 ±0.87	1.43 ±1.08	1.075± 0.73

V. Discussion

Dysmenorrhea is a severe painful cramping sensation in the lower abdomen. [(36)] It is characterized by lower abdominal pain that may radiate to the lower back and upper thighs and it is associated with nausea, headache, fatigue, and diarrhea. Physical exercises have been recommended as a non-pharmacological approach to the management of these symptoms. [(37)] It appears that exercises have analgesic effects that act in a non-specific way. [(28)] Exercises also stimulate the production of endorphins, which act as the body's natural painkillers. Stretching the abdominal muscles can help ease the period cramps. [(32)] The aim of the current study was to evaluate the effect of practicing home based stretching exercises and menstrual care on reducing pain intensity of primary dysmenorrhea and premenstrual symptoms for the adolescent girls.

Regarding demographic characteristics of the studied sample for the current study, the mean age of the studied girls was 18.10 ± 2.34 years old. Regarding the place of residence, most of the sample lived in urban areas. Also, fifty percent in both groups had a middle socioeconomic status. These results come in agreement with Abd EL-Hameed et al., [(38)] who made an assessment of dysmenorrhea and menstrual hygiene practices among the adolescent girls in some nursing schools at EL-Minia governorate, Egypt. Their results showed that the age of the adolescent sample ranged from fifteen to nineteen years old with mean age 17.2 ± 1.1 years old. As regards to the body mass index, the results of the present study reveals that forty six percent of the sample had a normal body weight, and thirty eight percent of them had overweight and obesity. In contrast, a study performed to find out the relation between dysmenorrhea and body mass index in adolescents with rural versus urban variation, they found that the prevalence of dysmenorrhea in adolescent girls was very high, resulting in disruption of their social and personal activities. Also, Indian adolescents have a very poor nutritional status, as reflected by their low BMI. Their study establishes a positive correlation between dysmenorrhea in adolescents and low BMI reflecting their poor dietary intake. [(39)]

Regarding the characteristics of menstruation for the two groups, the results of the present study illustrated that the age of menarche for the sample was about thirteen years old. This comes in accordance to Abd EL-Hameed et al., [(38)] who illustrated that the age of menarche for the respondents was more than or equal thirteen years old. In the same line, El-Gilany et al., [(40)] illustrated that the mean and median ages at menarche were about thirteen years old respectively. As regards to the number of pads, the current study showed that seventy percent of the study group compared to fifty-two percent in the control group used about three pads per day during the menstrual period. This comes in agreement with a study done in Egypt which mentioned that more than two-thirds of the students use more or equal three pads per day. This may be related to the Egyptian female students had enough information regarding the menstrual care practices. [(40)] The present study revealed that the adolescent females' duration of menstrual flow was more than five days and menstrual cycle length from twenty to thirty days. This finding was supported by the study carried out by Christensen and kochrow, [(41)] as most of the girls had menstrual cycle varies from twenty-four to thirty-two days.

Menstrual symptoms are a set of physical, emotional, and behavioral symptoms that occur a week before menstruation in most cycles. [(36)] Dysmenorrhea is a severe painful cramping sensation in the lower abdomen. It may be associated with other symptoms. As concerning premenstrual symptoms, more than half of the participants mentioned that fatigue is the most physical premenstrual symptom. More than one-third of the students had headache. Also, they suffered from constipation and excessive sweating. As regards to the emotional premenstrual symptoms, more than two-thirds of the girls suffered from mood changes (sadness and restlessness) and fifty-one percent of them had nervousness before menstruation. This comes in accordance with Deligeoroglou et al., [(42)] They mentioned that the physical symptoms of dysmenorrhea include breast tenderness or swelling, weight gain due to fluid retention, abdominal bloating, fatigue, dizziness, nausea and vomiting, acne or worsening of an existing skin disorders, muscle aches, pelvic heaviness, appetite change, constipation, headache, and backache. The emotional symptoms are insomnia, sadness, irritability, nervousness, anxiety, restlessness, loneliness and food cravings. There are also behavioral symptoms such as difficulty concentrating, forgetfulness and social avoidance. A recent study mentioned that depressed mood was the commonest symptom accompanying dysmenorrhea. Regarding the outcome of dysmenorrhea, sixty-seven percent of the sufferers reported emotional instability, while twenty-eight percent of them reported absenteeism from the university. [(43)] While Busari, [(44)] reported that more than half of the participants had abdominal pain, fifty percent had cramps, twenty-five percent had backache, twenty percent had pain in the thighs while fifteen percent had nausea during premenstrual period. During the menstrual period, 56% of the participants had abdominal pain, 62% had cramps, 30% had backache, 23% had pain in the thigh while 28% had nausea.

Results of the current study showed that more than half of the sample suffered from moderate dysmenorrhea and one-quarter of them had severe dysmenorrhea. As regards to the site of pain, more than one-third of them had abdominal pain while twenty-six percent of them suffered from pain in the suprapubic area. This pain generally still most time of the month for more than twelve percent of them and occurred sometimes for about two-thirds of the adolescent girls. In similar studies, the prevalence of dysmenorrhea was more than sixty percent. Logistic regression showed that heavy period was the first predictor of dysmenorrhea, followed by stress. The prevalence of severe dysmenorrhea among the sufferers was thirty-eight percent. [(43)] Also, during a study performed to identify the prevalence of menstrual pain in healthy university students. They stated that thirty percent of the surveyed students reported the occurrence of moderate pain during menstruation, and one-quarter of them reported the occurrence of severe menstrual pain. A significant percentage of young women complain of menstrual pain. Menstrual pain is associated with early age of menarche, obesity, and abdominal obesity. [(45)]

The pain score before menstruation, one day after menstruation, and two days after menstruation were significantly reduced from the pretest to posttest ($p< 0.001$*). Added to that, the premenstrual symptoms reduced after practicing the stretched exercises. The most reported premenstrual symptoms that reduced include fatigue, headache, mood changes, constipation, and excessive sweating. Another study mentioned that primary dysmenorrhea increases the uterine muscle contractions and nerve by the sympathetic nervous system is forming, thus reducing sympathetic activity, aerobic activity can reduce stress and pain. Thereby, the intensity of menstrual pain and other related symptoms may be reduced as well. [46]

The pain intensity (percentage of severe dysmenorrhea) for the studied group reduced from thirty-seven percent during the pretest to twelve percent during the posttest. Also, the percent of mild dysmenorrhea increased in a comparison to the percent measured during the pretest. This means that the pain intensity reduced. These results indicated that the stretching exercises can reduce the intensity of primary dysmenorrhea. Concerning the duration of menstrual pain, the finding of this study showed that the duration of menstrual pain was reduced significantly in our study group after 8 weeks training. This finding supported by previous studies carried out by Iorno et al., [47], Shavandi et al., [48] ; Shahrjerdi & Sheikh Hoseini, [49] and Mahvash et al., [24]. The decreased duration of the menstrual pain in the posttest for the study group indicated that physical activity can help a faster transfer of massive products and prostaglandins as a root of menstruation pain. According to Direkvand-Moghadam & Khosrav, [50] prostaglandin E2 stimulates cervical narrowing and increase vasopressin release lead to ischia and pain.

During the current study, it was found that after practicing the stretching exercises and menstrual care along eight weeks, pain duration and amount of consumed analgesic medications decreased significantly ($p<0.001$*) in the study group as compared to the control group. Also, pain duration during menstrual days reduced significantly from the pretest to the posttest. The results of different studies performed by Shahrjerdi & Sheikh Hoseini, [49] and Mahvash et al., [24] supported our results. At last, the recent studies supported that the stretching exercise had a positive effect on the intensity of primary dysmenorrhea. Vaziri et al., [27] stated that before the intervention, the mean intensity of dysmenorrhea was 40.38 ± 5.5, 37.40 ± 3.8, and 38.45 ± 3.3 in aerobic, stretching, and control groups, respectively, but the difference was not statistically significant. After the intervention, however, a significant difference was found among the three groups regarding the mean intensity of dysmenorrhea in the first and second menstrual cycles. Also, 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. [27]

VI. Conclusion and Recommendations

Based on the findings of the present study, it was concluded that primary dysmenorrhea is the most common complaint of adolescent girls. More than half of the participants mentioned that fatigue was the most premenstrual symptom. More than one-third of the students had a headache, mood changes (sadness and restlessness), nervousness, constipation, and excessive sweating before menstruation. The pain score before menstruation, one day after menstruation, and two days after menstruation were significantly reduced from the pretest to posttest ($p< 0.001$*). Added to that, the premenstrual symptoms reduced after practicing the stretching exercises. So, practicing the stretching exercises beside the usual menstrual care reduced the intensity of pain during menstruation for the studied group compared to those who did not practice it. Also, it reduced the premenstrual symptoms.

Based on the findings of the present study, it was recommended that:

- The nurses should provide health educational sessions to the adolescent girls about menstruation, the usual menstrual care, primary dysmenorrhea and premenstrual symptoms.
- Adequate books and magazines which include materials related to menstruation, menstrual care, and types of stretching exercises should be available to the school and college students.
- Secondary school curricula should contain items about menstruation, dysmenorrhea, and methods of management.
- Identification of abnormal menstrual patterns in adolescent females may improve early detection of potential health concerns for adulthood.

References

[1]. Steinberg L. (2014). Age of opportunity: Lessons from the new science of adolescence. Boston, MA: Houghton Mifflin Harcourt.

[2]. Agarwal AK. & Agarwal A. (2010). A study of dysmenorrhea during menstruation in adolescent girls. Indian J Community Med ;35:159-64.

[3]. AAP.(2015). Bright futures guidelines for health supervision of infants, children and adolescents. Journal of Adolescent and Family Health, Vol. 7, Iss. 2, Art. 2 Retrieved from https://brightfutures.aap.org/Bright%20Futures%20Documents/18 -Adolescence.pdf

[4]. Eswi A., Helal, H. & Elarousy W. (2012). Menstrual Attitude and Knowledge among Egyptian Female Adolescents. Journal of American Science, 8(6), 555-565.

[5]. Saudi Arabia Demographics Profile.(2014). Available at http://www.indexmundi.com/saudi_arabia/demographics_profile.html. Accessed on 9 March 2016.

[6]. Calis KA, Popat V, Dang DK & Kalantaridou SK. (2011). Dysmenorrhea. Available athttp://www.emedicine.medscape.com/article. Accessed on 9 March 2016.

[7]. Unsal A., Ayranci U., Tozun M., Arslan, G. & Calik E. (2010). Prevalence of dysmenorrhea and its effect on quality of life among a group of female university students. Upsala journal of medical sciences, 115(2), 138-145.

[8]. Marzouk T. M., El-Nemer, A. M. & Baraka H. N. (2013). The Effect of Aromatherapy Abdominal Massage on Alleviating Menstrual Pain in Nursing Students: A Prospective Randomized Cross-Over Study. Evidence-Based Complementary and Alternative Medicine.

[9]. Esimai O.A. & Esan G.O.(2010). Awareness of menstrual abnormality amongst college students in urban area of Ile-Ife, Osun state, Nigeria. Indian Journal of Community Medicine, 35:63–66.

[10]. Valiani M., Babaei E., Heshmat R. & Zare, Z. (2010). Comparing the effects of reflexology methods and Ibuprofen administration on dysmenorrhea in female students of Isfahan University of Medical Sciences. Iranian journal of nursing and midwifery research, 15(Suppl1), 371.

[11]. Kabirian M., Abedian Z., Mazlom S. R., Mahram B. & Jalalian M. (2011). Self- management in Primary Dysmenorrhea: Toward Evidence-based Education. Life Science Journal, 8(2),13-8.

[12]. Abdelmoty H.I., Youssef M.A., Shimaa abdallah S., Abdel-Malak K., Hashish N.M., Samir D., Abdelbar M., Hosni A.N., Abd-El Ghafar M., Khamis Y. & Seleem M. (2015). Menstrual patterns and disorders among secondary school adolescents in Egypt. A cross-sectional survey. BMC Womens Health; 15: 70.

[13]. Kural M., Noor N.N., Pandit D., Joshi T. & Patil A. (2015). Menstrual characteristics and prevalence of dysmenorrhea in college going girls. J Family Med Prim Care. Jul-Sep; 4(3): 426–431.

[14]. Habibi N., Huang M.S.L., Gan W.Y., Zulida R. & Safavi S.M .(2015). Prevalence of Primary Dysmenorrhea and Factors Associated with Its Intensity Among Undergraduate Students: A Cross-Sectional Study. American Society for Pain Management Nursing. Published by Elsevier Inc. Volume 16, Issue 6, December, Pages 855–861.

[15]. Kazama M., Maruyama K. & Nakamura K. (2015). Prevalence of dysmenorrhea and its correlating lifestyle factors in Japanese female junior high school students. Tohoku J Exp Med;236(2):107-13.
[16]. Dawood M. Y. (2006). Primary dysmenorrhea: advances in pathogenesis and management. Obstetrics & Gynecology, 108(2), 428-441.
[17]. Cakir M., Mungan I., Karakas T., Girisken I. & Okten A. (2007). Menstrual pattern and common menstrual disorders among university students in Turkey.Pediatrics International, 49(6), 938-942.
[18]. Parker M.A., Sneddon A.E. & Arbon P. (2010) .The menstrual disorder of teenagers (MDOT) study: determining typical menstrual patterns and menstrual Physical agents: theory and practice. Filadelfia: FA Davis Company.
[19]. Uzoma K. (2015). Can Exercising Stop Menstrual Cramps? Available at http://www.livestrong.com/article/384938-can-exercising-stop-menstrual-cramps/. Accessed on 9 March 2016.
[20]. Ministry of drinking water and sanitation. (2015). Menstrual hygiene management. National guidelines. December 2015. Government of India. Available at http://unicef.in/Uploads/Publications/Resources/pub_doc107.pdf. Accessed on 10 March 2016.
[21]. Poureslami M. & Osati-Ashtiani F.(2007). Attitudes of female adolescents about dysmenorrhea and menstrual hygiene in Tehran suburbs. Archives of Iranian Medicine, 5:219–224.
[22]. AdikaV.O, Ayinde M.O. & Jack-IdeI.O. (2013). Self-care practices of menstrual hygiene among adolescents school going girls in Amassoma Community, Bayelsa State. International Journal of Nursing and Midwifery. vol.5(5),pp.99-105, August.
[23]. Wong L.P & Khoo E.M. (2010). Dysmenorrhea in a multiethnic population of adolescent Asian girls. International Journal of Gynecology and Obstetrics, 108:139–142.
[24]. Mahvash N., Eidy A., Mehdi K., Zahra M. T., Mani M. & Shahla, H. (2012). The effect of physical activity on primary dysmenorrhea of female university students. World Applied Sciences Journal, 17(10), 1246-52.
[25]. Chang Y.T & Chen Y.C. (2010). Menstrual health care behavior and associated disturbance in a large population-based study of Australian teenagers. British Community Medicine, 35:63–66.
[26]. Sanyal S., & Ray S.(2011). Variation in the menstrual characteristics in adolescents of West Self-management in Primary Dysmenorrhea: Toward Evidence-based Education Life Science Journal; 8(2):13-18] (ISSN:1097–8135). http://www.lifesciencesite.com.
[27]. Vaziri F., Hoseini A., Kamali F., Abdali K., Hadianfard M. & Sayadi M. (2015). Comparing the Effects of Aerobic and Stretching Exercises on the Intensity of Primary Dysmenorrhea in the Students of Universities of Bushehr. J Family Reprod Health Mar; 9(1): 23–28.
[28]. Saleh H.S., Mowafy H.E. & Abd El Hameid A.A. (2016). Stretching or Core Strengthening Exercises for Managing Primary Dysmenorrhea. J Women's Health Care, 5(1).
[29]. Onur O., Gumus I., Derbent A., Kaygusuz I., Simavli S., Urun E., Yildirim M., Gok K. & Cakirbay H. (2012). Impact of home-based exercise on quality of life of women with primary dysmenorrhea. South African Journal of Obstetrics and Gynaecology. Vol 18, No 1.
[30]. Sehar N., Ahmad T., Ahmad V. & Sajwan S. (2015). Diagnosis and Management of Dysmenorrhea in Unani (GreekoArab) System of Medicine. International Journal of Advanced Ayurveda, Yoga, Unani, Siddha and Homeopathy, Volume 4, Issue 1, pp. 252-261, Article ID Med-243.ISSN: 2320 – 0251.
[31]. Gamit K.S., Sheth M.S. & Vyas N.J. (2014). The effect of stretching exercise on primary dysmenorrhea in adult girls. Int J Med Sci Public Health; 3(5): 549-551.
[32]. Ronning A.L. (2016). Get Rid of Menstrual Cramps. Available at: http://www.getridofthings.com/health/womens-health/get-rid-of-menstrual-cramps/. Accessed on 10 March 2016.
[33]. Nieswiadomy R. (2012). Foundations of Nursing Research. 6th ed. Person prentice hall. Upper Saddle River.pp:114-1129.
[34]. Jorgensen K. M. (1999). Pain assessment and management in the newborn infant. Journal of PeriAnesthesia Nursing, 14(6), 349-356.
[35]. Gift A. G. (1989). Validation of a vertical visual analogue scale as a measure of clinical dyspnea. Rehabilitation Nursing, 14(6), 323-325.
[36]. Yassin S. A. (2012). Herbal Remedy used by Rural Adolescent girls with Menstrual Disorders. Journal of American Science, 8(1), 467-473.
[37]. Rasoolzadeh N., Zebardast J., Zolphagari M. & Mehran, A. B. (2007). Effects of Relaxation on Primary Dysmenorhea among First Year Nursing and Midwifery Female Students. Hayat, 13(2).
[38]. Abd El-Hameed N.A., Mohamed M.S., Ahmed H.N. & Ahmed E.R. (2011). Assessment of Dysmenorrhea and Menstrua Hygiene Practices among Adolescent Girls in Some Nursing Schools at EL- Minia Governorate, Egypt . Journal of American Science;7(9)216-223].(ISSN:1545-1003 Medicine, 2002, 5:219–224.Nursing Research, 2008, 16:8–16.
[39]. Chauhan M. & Kala J. (2012). Relation Between Dysmenorrhea and Body Mass Index in Adolescents with Rural Versus Urban Variation. J Obstet Gynaecol India. Aug; 62(4): 442–445. Published online 2012 Jun.
[40]. El-Gilany A., Badawi K. & El-Fedawy S. (2005). Epidemiology of dysmenorrhoea among adolescent students in Mansoura, Egypt. Eastern Mediterranean Health Journal, 11(1/2), 155.
[41]. Christensen B.L. & Kockrow E.O.(2006). Foundation of nursing London, Toronto, Vol.926,pp 121-35.
[42]. Deligeoroglou E., Tsimaris P., Deliveliotou A., Christopoulos P. & Creatsas G. (2006). Menstrual disorders during adolescence. Pediatric endocrinology reviews: PER, 3, 150-159.
[43]. Ibrahim N.K., AlGhamdi M.S., Al-Shaibani A.N., AlAmri F.A., Alharbi H.A., Al-Jadani A.K. & Alfaidi R.A. (2015). Dysmenorrhea among female medical students in King Abdulaziz University: Prevalence, Predictors and outcome. Pak J Med Sci. Nov-Dec; 31(6): 1312–1317.
[44]. Busari A.O. (2012). Menstrual Knowledge and Health Care behavior among Adolescent Girls in Rural, Nigeria. International Journal of Applied Science and Technology. Vol. 2 No. 4; April.
[45]. Teul I., Kliś K., Jarzębak K., & Wronka I. (2014).THE PREVALENCE AND CORRELATES OF MENSTRUAL PAIN IN HEALTHY UNIVERSITY STUDENTS. Ann Acad Med Stetin.;60(2):89-94.
[46]. Dehghanzadeh N., Khoshnam E. & Nikseresht A. (2014). The effect of 8 weeks of aerobic training on primary dysmenorrhea. European Journal of Experimental Biology, 4(1), 380-382.
[47]. Iorno V.R., Burani B., Bianchini E., Minelli F., Martinelli & Ciatto S. (2007). Acupuncture treatment of dysmenorrhea resistant to conventional medical treatment. Creative Commons Attribution Non-Commercial License, http://creativecommons.org/ licenses/by-nc/2.0/uk/
[48]. Shavandi N., Taghian F. & Soltani V. (2009). The effect of isometric on primary dysmenorrhea. Arak Medical University Journal (AMUJ), 13(1): 71-77.
[49]. Shahr-jerdy, S., Hosseini, R. S., & Gh, M. E. (2012). Effects of stretching exercises on primary dysmenorrhea in adolescent girls. Biomedical Human Kinetics, 4, 127-132.
[50]. Direkvand-Moghadam A. & Khosravi A. (2012). Comparison of Verbal Multidimensional Scoring system (VMS) with Visual Analogue Score (VAS) for evaluating of Shirazi Thymus Vulgaris on menstrual pain. Journal of Pharmaceutical and Biomedical Sciences (JPBMS), 23(23).