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Effect of Home based Stretching Exercise on Dysmenorrhea among Adolescent Girls

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Abstract: *Primary dysmenorrhea is a difficult menstrual flow in the absence of any pelvic pathology where pain is spasmodic in character and felt mainly in the lower abdomen .It can influence females' daily-life activities. Stretching exercises has been advocated to reduce the pain of primary dysmenorrhea. Methods: A quasi – experimental design was utilized. Sample: Purposive sample of 164 adolescence girl. Setting: The study was carried out at two secondary schools at Menouf city (Martyr Pilot Ezzat secondary school and co-secondary developed school. Instrument: Adolescent girls structured interviewing questionnaire, a menstruation assessment questionnaire, and a Numerical Rating Scale (NRS) and a home based stretching exercises checklist. Result: there is a highly statistically significant difference and reduction on menstrual pain score, duration of pain and use of painkiller to relive this pain between the study and the control group. Conclusion: Stretching exercises are effective in reducing pain in young females with primary dysmenorrhea. Recommendations: Secondary school curricula should contain items about menstruation, dysmenorrhea, and methods of management including stretching exercise.*

Key Words: *Exercise, Stretching, Primary dysmenorrhea, Adolescents Girl.*

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I. Introduction

One of the major physiological changes that occur in adolescent girls' life is the onset of menarche, which is often associated with problems of irregular menstruation, excessive bleeding, and dysmenorrhea(Nag,2013). Dysmenorrhea is one of the most common problems experienced by adolescent girls (Agarwal&Agarwal, 2015). Physical exercise has been suggested as a non-medical approach to the management of symptoms. The idea that various types of active or passive exercise might help in alleviating pain in primary dysmenorrheal is not a new issue. It is widely thought that the exercise reduces the frequency and/or the severity of dysmenorrheal syndrome (Daley et al., 2013).

Home-based stretching exercises recommended as an effective intervention and seemed to provide a significant improvement in pain intensity of dysmenorrhea. It has an analgesic effect (Gamit, Sheth&Vyas, 2014). 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. Nurses should provide counseling and support to adolescent girls on how to improve their diets; weekly iron and folic acid supplementation. (Ministry of drinking water and sanitation, 2015). Also, nurses can play an active role in pain management through posing comfort measures and reassurance to relieve pain. Their role includes as well, offering therapies for symptoms relief, checking safety or side effects of these therapies and referring female students to a physician if severe symptoms such as intense pain or vomiting occur regularly for 3 months or more. (Poureslami&Osati-Ashtiani,2017).

Appropriate counseling and management should be instituted among female students. This aim to help them cope with the challenges of dysmenorrhea. Information, education and support should also be extended to parents, school peer leaders, and hostel administrators in order to address the reproductive health needs of the female students (Kenneth et al., 2013).

Significance of the study:

According to Onur et.al.(2013), menstrual disorders present a major health problem among adolescent girls because they influence not only future fertility, but also mental health and quality of life. The incidence of primary dysmenorrhea was reported to be between 20% and 90% in different communities. Self-care practices as well as menstrual hygiene are basic requirements for promoting a satisfied life and personal esteem in a woman (Adika, Ayinde& Jack-IdeI, 2013).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 (Ministry of drinking water and sanitation, 2015). Home-based stretching exercises recommended as an effective intervention and seemed to provide a significant improvement in pain intensity of dysmenorrhea. It has an analgesic effect (Gamit, Sheth&Vyas, 2014). 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. Therefore, this research is intended to study the effect of practicing home based stretching exercises on reducing pain intensity of primary dysmenorrhea for the adolescent girls.

Purpose of the Study:
The purpose of the study is to investigate the effect of practicing home based stretching exercises on reducing pain intensity of primary dysmenorrhea among adolescent girl.

Research Hypotheses:
Adolescent girls who practice home based stretching exercises have less menstrual pain intensity than those who do not practice such exercises.

II. Methods

Research design:
A quasi-experimental design was used to carry out the present study where there were two groups; (Study& control).

Setting:
The present study was conducted in a selected secondary school at Menouf city (Martyr Pilot Ezzat secondary school and co-secondary developed school) .Both schools are affiliated to the ministry of education, in Menouf city, Menoufia Governorate in Egypt.Such settings were selected because this setting easy to access and contains a large number of female adolescents.The students were not subject to any of nursing instruction or health guidelines .They also have a lack of health awareness and these settings were governmental school.

Martyr Pilot Ezzat secondary school:-It is affiliated to the Ministry of Education; it was established in 1973in Menouf city and consists of three sections. Each section contains four classes; three classes for ordinary students and the fourth for mentally disabled students. The school has a park surrounding it and there is a sports stadium and a building dedicated to theatrical and musical activities. The school has three grades: first grade has 200 female students, the second grade has 200 students, and the third grade has 150 students, bringing the total number of female students to 550.The co-secondary developed school:-It is affiliated to the Ministry of education. It was established in 1968 in Menouf city and consists of five sections; each section contains six classes for ordinary students. The school has a park surrounding it and there is a sports stadium and a building dedicated to theatrical and musical activities. The school has three grades: first grade has 150 female students and 100 male students, the second grade has 150 female students and 150 male students, and the third grade has 100 female students and 100 male students, bringing the total number of female students to 400 and male student to 350 students.

Sampling:
A Purposive sample of One hundred and sixty- four adolescent girls (110 adolescent girls from Martyr Pilot Ezzat secondary school and 54adolescent girls from Co-secondary developed school) fulfilled the inclusion criteria and were enrolled in the current study. Forty girls were selected from the first grade; forty were selected from the second and thirty from the third grade. Twenty girls were selected from the first grade; twenty girls were selected from the second and fourteen girls from the third grade The cases were then randomly assigned to two groups, according to list of students names as girls that had odd numbers in the list were enrolled in group A (intervention group).As for girls who had even numbers in the same list were enrolled in group B (control group). This technique avoided sample contamination and bias.This technique helped in avoiding sample contamination and bias.

Sample size: Based on the past review of the literature that examines the same outcomes and found significant differences, a sample size has been calculated using the following equation:-
At power 80%and CI 95%the sample size was conducted to be 164 adolescent girls with dysmenorrhea.

$$n = \frac{z^2 \times \hat{p}(1-\hat{p})}{\varepsilon^2}$$

Where

z is the z score **ε** is the margin of error

N is population size **p̂** is the population proportion

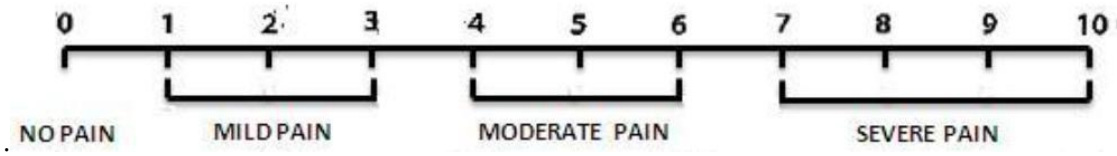
The target population was 164 adolescent girls. Based on the sample size measured, a total of 164 adolescent girls (82 for each group) participated in the study. Using a purposive sampling the whole populations (164 participants) were recruited.

Instruments:

Instrument I: Adolescent girls structured interviewing questionnaire: the researcher developed the interview questions based on an extensive literature review. It consisted of three parts: the first part contained questions related to the socio-demographic characteristics, the second part contained data related to the past medical and family history and the third part contained data related to the physical characteristic of girl.

Instrument II: Menstruation assessment questionnaire: That was developed by the researcher based on pertinent literature and guidance of supervisors. It consisted of two parts: the first part contained questions related to age of menarche, regularity of menstruation, duration of menstruation, interval of menstruation , the second part contained data related to the amount of menstrual blood loss.

Instrument III: Numerical Rating Scale (NRS): It issimple to use but it requires that the student be able to conceptualize pain in this assessment tool developed by (Lafoy and Goden, 2000) for description student self-rating of pain. The scale was used to assess pain intensity and severity before and after intervention. The students were asked to write the number from (0 to 10) or mark a spot on the line corresponding to the intensity of their pain at a particular time on a possible scale of (0 to 10) on a horizontal line. Rating took place as follows: No pain (Score 0), Mild pain (Score 1), from 1-3 was characterized by painful menstruation but seldom inhibits the normal activity, analgesics are seldom required, moderate pain (Score 2) from 4-6 was characterized by daily activity affected and analgesics are required to give relief .Severe pain took score 3 where 7-10 was characterized by no tolerance to pain and activities are clearly inhibited and poor effect of analgesic.



A numerical rating scale (NRS) measurement of pain level

It was adopted from **Goda (2015**). It was used to assess the accuracy of applying home- based stretching exercises and follow up of application. The instrument consisted of the following two parts:

Part I: A follow up of exercise application: It includes the type of exercise and the number of weeks of exercise application, the number of exercise frequency per day and the duration of each contraction and relaxation.

Part II: A checklist for exercise application : It contained 5 items to assess the accuracy of the home-based stretching exercises .The researcher used this instrument for adolescent girls in the study group for each follow up visit (4 weeks).

Scoring of Home-based stretching exercises checklist:

The home-based stretching exercises checklist was assessed through 5 questions that were scored as follows: (0) not done, (1) done but not accurate and (2) done and accurate. The total score of home based stretching exercises checklist questions ranged from 0-10 and was categorized into four levels, according to **Goda(2015)** as follows:

- Poor application of home-based stretching exercises< 2 scores.
- Fair application of home-based stretching exercises (= 3-5 scores).
- Good application of home-based stretching exercises (= 6- 8 scores).
- Excellent application of home-based stretching exercises (= 9-10 scores).

These scores were recorded after each follow-up visit for adolescent girls in the study group .Girls who scored less than (5) were excluded from the study because they did not apply the exercise well.

Validity of the instrument:

The validity of the instrument was done by five qualified experts (three experts in Maternal and Newborn Health Nursing department at the Faculty of Nursing and two physicians from the Obstetrics and Gynecology department at the Faculty of Medicine).They reviewed the instrument for content accuracy and internal validity. They were also asked to judge the items for completeness and clarity (content validity). Suggestions were incorporated into the instrument.

Reliability of the instrument:

The reliability of the instrument was done by the researchers for testing the internal consistency of the instrument, using test retest reliability. It was done through the administration of the same instrument to the same subjects under similar conditions on one or more occasions. Scores from repeated testing were compared to test the consistency of the results over the time.Its reliability was assessed by piloting & measuring the related Cronbach's alpha value (Alpha = 0.88).

Administrative Approvals: An official latter was taken from the dean of the Faculty of Nursing , Menoufia University and submitted to the director of Martyr Pilot Ezzat secondary school and Co-secondary developed school) at Menouf city. An official permission was obtained to carry out the study from the directors of the above mentioned settings. Also, the approval of the Ethical Committee of the Faculty of Nursing, Monoufia University was obtained.

Ethical Consideration:

An approval from the committee of Hearing and Ethics was obtained from Faculty of Nursing, Menoufia University on 21/3/2018 (Appendix). Approaches to ensure ethics were considered in the study regarding confidentiality and the informed consent. The researcher introduced herself to the study participants and explained the purpose of the study and its nature of the research to obtain their acceptance to be recruited in the study as well as to gain their cooperation. Confidentiality was achieved by the use of closed sheets with the names of the participating girls replaced by numbers. All participating girls were informed that the information they provided during the study would be kept confidential and used only for statistical purposes. After finishing the study, the findings would be presented as a group data with no personal participant's information remained.

Pilot study

A total of 10% of the participants (17girls) were included in the piloting. They were recruited from Martyr Pilot Ezzat secondary school in order to assess the feasibility and clarity of the instruments and determine the needed time to answer the questions. All adolescent girls participated in the pilot study excluded from the study sample because the researcher made some modification of the instruments.

Field work: The current study was carried out on four phases:

1- Preparatory phase: The researcher prepared educational session as well as home based stretching exercise training booklet which included three chapters to provide adolescent girls information about home based stretching exercise and its effect on dysmenorrhea.

2. Interviewing phase: The researcher collected the data from the adolescent girls in both groups (study and control groups) through an interview and physical assessment.

3) Implementation phase(for the study group only): The researcher provided the instructions to the adolescent girls about home based stretching exercise training through two educational setting:

First seession:-Immediately started after assessment and contained two educational sessions, each session took about 30-45 minutes and there are 15 minutes break between the two sessions. Extra time allowed for the students for asking any question or clarification related to the sessions.Provide adolescent girls simple information about definition, types, causes and signs and symptoms of dysmenorrhea. Discussed with the adolescent girls what are dysmenorrhea, the main sign and symptom of dysmenorrhea, the causes of dysmenorrhea and the types of dysmenorrhea as Primary dysmenorrhea which occurs without an associated underlying condition, while secondary dysmenorrhea has a specific underlying cause, typically a condition that affects the uterus or other reproductive organs as endometriosis, leiomyoma , adenomyosis, ovarian cysts, and pelvic congestion. After finishing the first session all girls took break for 15 min to eat some snacks and drink juice.

Second session Provide adolescent girl's simple information about mechanism and general principles of home based stretching exercise .Discussed to the adolescent girls what home based stretching exercise is, its importance and its contraindications. Also explained how to apply home based stretching exercise accurately and safely by using home based stretching exercise checklist. The researcher provided instructions to adolescent girls about five types of home based stretching exercise. 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) and must avoid performing the home based stretching exercise during the menstrual cycle. The researcher explained the correct techniques of home based stretching exercise by practiced it first in front of them and by using the computer and colored handouts. The researcher selected the five types of exercises after extensive review to reduce the pain intensity of primary dysmenorrhea. First, stretching exercise in which the girl 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. The duration of holding time was 5 seconds; repetition was 10 times (Figure 1). The second stretching exercise in which the girl was requested to stand 10-20 cm behind a chair, then raise one heel off the floor and repeat the exercise with the other heel alternatively. The exercise was performed 20 times (Figure 2). In the third exercise, the girl was asked to spread her feet wider than shoulder width. Then, the girl 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). In the fourth exercise, the girl 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).In the fifth exercise, the girl 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).

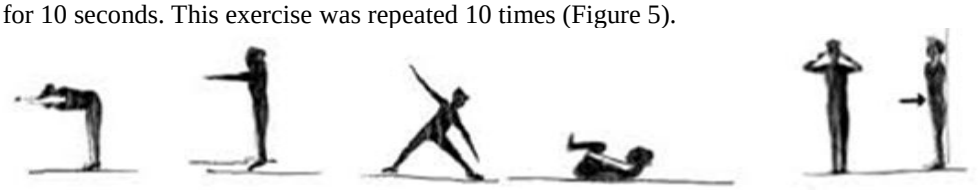


Fig (1) **Fig (2)** **Fig (3)** **Fig (4)** **Fig (5(**

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) as starting at end of menstruation and avoid performing the stretching exercises during the menstrual cycle. At the end of the sessions, each girl was given a booklet with clear Arabic language. The researcher scheduled with each girl for the next visit after four weeks to follow-up the severity of menstrual pain.

4) Evaluation phase:

In this phase, all the adolescent girls recruited in the study were evaluated for the intensity of the menstrual pain by the researcher using the follow-up form (instruments 4) every four weeks for two cycles. Home-based stretching exercises were carried out for adolescent girls in the study group whereas routine care was given to the control group. The posttest was used to examine pain intensity, pain duration, and the use of sedative drugs for both groups. The researcher received the data by a telephone contact to assess the effectiveness of the intervention in some cases. This post assessment took about 15-20 min for each woman and the telephone call took about 15 minutes. The researcher found that study group had less pain than the control group revealed from the numerical rating scale.

1. STATISTICAL ANALYSIS

Data analysis

The collected data were scored, tabulated and analyzed using (SPSS) version 22. Descriptive as well as nonparametric statistics were utilized to analyze the data pertinent to the study. The level of significance was set at $p < 0.05$. Chi square test, Independent sample t-test, Fischer exact test (FE), Mean and Mann-Whitney test (nonparametric test) were used to analyze the data.

2. RESULTS

Table (1): Socio-demographic characteristics of the study participants (N =82)

Variables :	Study (n=82)		Control (n=82)		X^2	P -value
	No	%	No	%		
Age group						
a) 14 - <17 years	30	36.6%	30	36.6%	$0.00^{(NS)}$	1.00
b) 17- <19 years	52	63.4%	52	63.4%		
Residence Rural	82	100%	82	100%	A	-

The level of academic year						
- 1st year	30	36.6%	30	36.6%	0.00 (NS)	1.00
- 2nd year	30	36.6%	30	36.6%		
- 3rd year	22	26.8%	22	26.8%		

Table (1) shows the socio-demographic characteristics of the studied participants. There was no statistical significant deference (P –value = .55) between two group (study and control group) regarding to age, residence and level of academic year.

Table (2): Menstrual History for the Study Participants:-

Variables :	Case (n=82)		Control (n=82)		X^2	P – value
	No	%	No	%		
Your age at menarche?						
- Less than10years	3	3.7%	4	4.9%	**0** .15 (NS)	0.69
- 10- <16 years	79	96.3%	78	95.1%		
Regularity of menstruation						
- Regular	82	100%	82	100%	NA	
Duration of menstruation (days)						
- 3 - 6 days	82	100%	82	100%	NA	
Interval of menstruation (days)						
a- 21-28 days	82	100%	82	100%	NA	
Amount of menstrual blood loss						
- Light bleeding :Need to change the pad three times a day	69	84.1%	70	85.4%	**0** .05 (NS)	0 .83
- Moderate bleeding: Need to change the pad from three to four timesa day.	13	15.9%	12	14.6%		
While changing the pad ;it is totally socked with blood						
- Totally soaked	66	80.5%	56	68.3%	3.20 (NS)	0.07
- Partially soaked	16	19.5%	26	31.7%		
Hygienic practice used during the menstruation						
- Medical disinfectant lotion	7	8.5%	12	14.6%		
- Bathing daily	27	32.9%	33	40.2%	8.48 (NS)	0 .07
- Change the underwear frequently	28	34.1%	25	30.5%		
- Sitting in the warm water	11	13.4%	11	13.4%		
- Others	9	11.0%	1	1.2%		

Table (2) shows menstrual history for the studied participants. All participants in both control and study groups were having regular menstruation and used to experience menstruation every 21-28 days and reported 3-6 days duration.There was no statistical significant deference(P –value = .83) between two group (study and control group) regarding to age of menarche, amount of menstrual blood loss, saturation of pad changed during the day and hygienic practice used during the menstruation.

Table (3): Home Based Stretching Exercise follow up for the studied girls in the study group on pre, post and follow-up intervention.

Variables	Pre (n=82)		Post (n=82)		Follow-up (n=82)		X^2	P - value
	No	%	No	%	No	%		
Did you practicing home based stretching exercises for eight weeks regularly?								
- Yes	0	0.0%	82	100%	82	100%	$\chi^2$1= 164.0 (HS)	P1= .000
- No	82	100.0%	0	0.0%	0	0.0%	$\chi^2$2=NA	P2=
If yes what is the type of home based stretching exercises you are practice ?(you may choose more than one answer)	82	100.0%	0	0.0%	0	0.0%		
	0	0.0%	1	1.2%	0	0.0%		
	0	0.0%	1	1.2%	0	0.0%	$\chi^2$1=164.0 (HS)	P1=.000
	0	0.0%	1	1.2%	0	0.0%	$\chi^2$2= 5.16 (NS)	P2= .39
- None of the following	0	0.0%	1	1.2%	0	0.0%		
- The first exercise	0	0.0%	1	1.2%	0	0.0%		

- The second exercise - The third exercise - The forth exercise - The fifth exercise - allfive exercise	0	0.0%	77	93.9%	82	100.0 %		
Did you practicing home based stretching exercises 3 days per week? - Yes - No	0 82	0.0% 100.0%	82 0	100% 0.0%	82 0	100% 0.0%	$\chi^2$1=164.0(HS) $\chi^2$2= NA	P1= .000 P2=-
Did you practicing home based stretching exercises 2 times per day for 20-30 minutes? - Yes - No	0 82	0.0% 100.0%	82 0	100% 0.0%	82 0	100% 0.0%	$\chi^2$1= 164.0(HS) $\chi^2$2= NA	P1=.000 P2= -
Did you start practicing home based stretching exercises at end of menstruation - Yes - No	0 82	0.0% 100.0%	82 0	100% 0.0%	82 0	100% 0.0%	$\chi^2$1= 164.0(HS) $\chi^2$2= NA	P1= .000 P2=-

Table (3):shows that there is highly statically significant difference between pre and post intervention regarding distribution of home based stretching exercise follow up for the studied girls in the study group. Mean whilethere were no statically significant difference between post and follow up intervention regarding home based stretching exercise follow up for the studied girls in the study group.

Table (4): Checklist for home based stretching exercises for the studied girls in the study group on pre, post and follow-up intervention.

Home based stretching exercise	**Pre (n=82)**		**Post (n=82)**		**Follow-up (n=82)**		**X^2**	**P - value**
	No	%	No	%	No	%		
First stretching exercise - Not done - Done but not accurate - Done and accurate	82 0 0	100.0% 0.0% 0.0%	0 13 69	0.0% 15.9% 84.1%0	0 0 82	0.0% 0.0% 100.0%	$\chi^2$1=151.0(HS) $\chi^2$2=14.12(HS)	P1=.000 P2=.000
Secondstretching exercise - Not done - Done but not accurate - Done and accurate	82 0 0	100.0% 0.0% 0.0%	0 0 82	0.0% 0.0% 100.0%	0 5 77	0.0% 6.1% 93.9%	$\chi^2$1= 164.0(HS) $\chi^2$2=5.16 (S)	P1= .000 P2=.02
Third stretching exercise - Not done - Done but not accurate - Done and accurate	82 0 0	100.0% 0.0% 0.0%	0 0 82	0.0% 0.0% 100%	0 0 82	0.0% 0.0% 100%	$\chi^2$1= 164.0(HS) $\chi^2$2= NA	P1= .000 P2=-
Fourth stretching exercise - Not done - Done but not accurate - Done and accurate	82 0 0	100.0% 0.0% 0.0%	0 11 71	0.0% 13.4% 86.6%	0 7 75	0.0% 8.5% 91.5%	$\chi^2$1= 164.0(HS) $\chi^2$2= .99(NS)	P1= .000 P2=.32
Fifth stretching exercise - Not done - Done but not accurate - Done and accurate	82 0 0	100.0% 0.0% 0.0%	0 0 82	0.0% 0.0% 100%	0 0 82	0.0% 0.0% 100%	$\chi^2$1= 164.0(HS) $\chi^2$2= NA	P1= .000 P2= -

Table (4):shows that there is highly statically significant difference between pre, post andfollow up intervention regarding checklist for home based stretching exercises for the studied girls (first exercise) in the study group. Regarding second exercise there is highly statically significant difference between pre and post intervention mean while there were statically significant difference between post and follow up intervention.As for third, fourth and fifth exercise there is highly statically significant difference between pre and post intervention mean while there were no statically significant difference between post and follow up intervention.

Table (5): Comparison of menstrual pain follow up between study and control group on post and follow-up intervention.

Variables	Post				Follow-up				X^2	P -value
	Control		Study		Control		Study			
	No	%	No	%	No	%	No	%		
Pain score										
a) No pain =0	0	0.0%	0	0.0%	0	0.0%	16	19.5%	$\chi^2$1= 117.8(HS)	P1= .000
b) Mild pain =(1-3)	0	0.0%	68	82.9%	0	0.0%	58	70.7%		P2=.000
c) moderate pain =(4-6)	26	31.7%	8	9.8%	34	41.5%	5	6.1%	$\chi^2$2=135.29(HS)	
d) Severe pain=(7-10)	56	68.3%	6	7.3%	48	58.5%	3	3.7%		
On average, how many hours has this pain lasted?									$\chi^2$1= 125.0(HS)	P1= .000
- 1-2 hours	0	0.0%	0	0.0%	0	0.0%	28	34.1%	$\chi^2$2=160.10(HS)	P2=.000
- 3–5 hours	0	0.0%	57	69.5%	0	0.0%	44	53.7%		
- 6–8 hours	0	0.0%	12	14.6%	0	0.0%	9	11.0%		
- 9–12 hours	38	46.3%	13	15.9%	36	43.9%	1	1.2%		
- 12-18 hours	17	20.7%	0	0.0%	15	18.3%	0	0.0%		
- 18-24 hours	27	32.9%	0	0.0%	31	37.8%	0	0.0%		
Site of pain										
- Abdomen	7	8.5%	14	7.1%	7	8.5%	14	17.1%		
- Lower back	9	11.0%	13	15.9%	11	13.4%	13	15.9%		
- Lower abdomen and back	47	57.3%	38	46.3%	54	65.9%	38	46.3%	$\chi^2$1= 4.13(NS)	P1=.248
- Suprapubic area	19	23.2%	17	20.7%	10	12.2%	17	20.7%	$\chi^2$2=12.27(S)	P2=.015
Other symptom associated with menstrual pain										
- None	20	24.4%	11	13.4%	19	23.2%	20	24.4%		P1=.098
- Vomiting	14	17.1%	15	18.3%	14	17.1%	15	18.3%	$\chi^2$1= 10.70(NS)	P2= .351
- Diarrhea	12	14.6%	21	25.6%	15	18.3%	18	22.0%	$\chi^2$2=6.68(NS)	
- Stress	23	28.0%	17	20.7%	23	28.0%	13	15.9%		
- High temperature	3	3.7%	2	2.4%	2	2.4%	2	2.4%		
- Headache	9	11.0%	9	11.0%	8	9.8%	8	9.8%		
- Breast pain	1	1.2%	7	8.5%	1	1.2%	6	7.3%		
Use of painkillers to relieve this pain?									$\chi^2$1= 71.29(HS)	P1=.000
- Yes	70	85.4%	16	19.5%	73	89.0%	6	7.3%	$\chi^2$2=109.6 (HS)	P2= .000
- No	12	14.6%	66	80.5%	9	11.0%	76	92.7%		

Table (5):show that there is highly statically significant difference between study and control group on post and follow-up intervention regarding menstrual pain score, use of painkiller to relive this pain and number of hours has this pain lasted. Regarding to site of pain there is no statically significant difference between study and control group on post intervention mean while there is statically significant difference between study and control

group on follow up intervention.As for symptom associated with menstrual pain there is no statically significant difference between study and control group on post and follow-up intervention

III. Discussion

The aim of the current study was to evaluate the effect of practicing home based stretching exercises on reducing pain intensity of primary dysmenorrhea for the adolescent girls. The discussion encompasses the socio-demographic characteristics and menstruation characteristics also; the effect of practicing home based stretching exercise on severity of pain in the primary dysmenorrhea. Regarding demographic characteristics of the studied sample for the current study, more than half of the study participants were 17-19 years in both groups. This may reflect girls in the study groups at this age were more likely to have menstruation and suffer from primary dysmenorrhea than older ones. This may be rationalized as there is high prevalence of primary dysmenorrhoea among adolescents especially in the first years of their reproductive life also because older women there are high prevalence of secondary dysmenorrhoea than adolescents and they are at important stage in their lives as they need more support and care. This come in agreement with Abd EL-Hameed et al, (2011) who assessed dysmenorrhea and menstrual hygiene practices among the adolescent girls in some nursing schools at EL-Minia governorate, Egypt. They reported that the age of the adolescent sample ranged from (15-19) with mean age 17.2 ± 1.1 years old. As regards to residence all of study participants were from rural areas. This may be rationalized as there were many girls residing in rural areas are unaware of what actually happens during menstrual cycle although menstruation is a natural process, it is linked with several perceptions and practices within the community, which sometimes may result in adverse health outcomes and there were have a lack of health awareness. Also in a traditional family setting in developing countries, mothers are usually the care takers of their daughters during these critical phases of physical and emotional development. In a conservative society and in rural population, the subject of menstruation and its hygiene is still considered a taboo subject for discussion. This comes in agreement with Chauhan & Kala, (2012) who assessed relation between dysmenorrhea and body mass index in adolescents with rural versus urban variation at Rajkiya Balika Uchh Prathmik Vidyalaya, Bedla in India. Their findings reveal that of the total 200 girls in the rural setup (100%), 52 % had mild, 26.5 % had moderate, and 3 % had severe dysmenorrhea. As regards to education, all of study participants were from secondary schools where more than one third were in first and second year while about one quadrant were in the third year in both control and study group. This may be rationalized as public secondary school students are in the teen's stage where they undergo many changes that occur to them and they do not have full health awareness to deal with these problems that face them and the student have not been subject to any of nursing instruction and health guidelines and have a lack of health awareness than students at the vocational school of nursing. Also, because Teachers leave a positive impact and greatly influence the minds of children. But the issue of menstrual hygiene is seldom being discussed in the school curriculum. Therefore, to understand the consequences and importance of menstrual hygiene practices among adolescent girls, it is important to study the current practices. This was supported by Hanan et al, (2013) who investigated the effect of dysmenorrhea on quality of life of technical secondary schools girls in Mansoura, Egypt. Their findings reveal that the study includes a total of 1092 technical secondary school girls. Their age ranged from 15 to 19 years with a mean of (16.8 ±0.876) years. These findings are in disagreement with Abd EL-Hameed et al, (2011) who assessed dysmenorrhea and menstrual hygiene practices among the adolescent girls in some nursing schools at EL-Minia governorate, Egypt. They reported that a total of 160 students were recruited into the study, 86 students from Mallway nursing school, and seventy-four from Abu-Korkas nursing school. Regarding the age at menarche almost of participants had experience menarche at the age of 10-<16 years. This may be rationalized as this discrepancy may be due to lifestyle changes in female adolescents.This comes in agreement with Kural et al, (2015) who assessed menstrual characteristics and prevalence of dysmenorrhea in college going girls in Madhya Pradesh, India. Their findings reveal that The average age of menarche was reported as 13.8 ± 1.6 years (ranging from 9 to 19), majority of the participants (97.6%) fall between 10 and 17 years, remaining 1.6% had started menstruating after the age of 18 and only 0.7% were had started menstruating below 10 years.Regarding the characteristics of menstruation all of study participants in were having regular menstruation. All of study participants in the study and control groups used to experience menstruation every 21-28 days and reported 3-6 days duration. This may be related to improvement of nutritional and socioeconomic status of the adolescents in recent decades. Also, normalizing menstruation, empowering girls to highlight the right of women and girls to manage their periods correctly.This comes in agreement with Eittah et al, (2014) who investigated the effect of breakfast skipping on young females' menstruation at Shebin Elkom, Menofiya ,Egypt . Their findings reveal that (85%) of the sample had regular cycle, but only 15% had irregular cycle. Regarding the duration of menses, the majority of the sample's (85.7%) duration ranged between three to seven days. Additionally, more than two thirds of the sample had moderate menstrual flow (72.3%)..As for symptom associated with menstruation about one third of participants in the control group had headache while one quadrant of participants in the study group had diarrhea. This may be rationalized as a variety of factors are

indicated to influence menstruation , most importantly are the psychological factors like stress, nutritional factors and hormonal effects and also because the uterine contraction that occurs during menstruation is painful is generally accompanied with other symptoms, including tiredness, painful/tender breasts, supra pubic cramping, backache, general pain and vomiting.This comes in agreement with a study performed by Hanan et al, (2013) who investigated the effect of dysmenorrhea on quality of life of technical secondary schools girls in Mansoura, Egypt. Their findings reveal that more than two third of participants (8 8. 1 %) with dysmenorrhea reported some associated symptoms. The most frequently reported symptoms loss of appetite (n=576, 51.9%), decrease in concentration (n=511, 46.8%), headache (n=510, 46.7%), dizziness (n=484, 44.3%). The other symptoms reported were nausea and vomiting (n=287, 26.3%), diarrhea (n=182, 16.7%), fainting (n=74, 68%) and sweating (n=27, 2.5%).Regarding to hygienic practice used during menstruation about one third of study participants used bathing daily respectively. This may be rationalized as now, there is some openness toward menstruation, but differences in attitude still persist between different populations .There are differences between countries, cultures, religions, and socioeconomic class. And also because, young girls has believe that taking a bath with warm water in the early days of menstrual period, would lead to the development of positive mental and physical health. This comes in agreement with a study performed by Choeden etal, (2017) who assessed knowledge, attitude and practices of menstrual hygiene management by adolescent school-going girls and nuns in Bhutan that landlocked country in South Asia. Their findings reveal that when asked whether they take bath during period, more than half (58.1%) reported that they do so. Around 13 % reported that they take bath only on second day followed by 10 % who bathe on the very first day. Around 4 %of them do not bath any time. It was also, these findings are in disagreement with study by El-Gilany et al, (2005) that assessed menstrual hygiene among adolescent schoolgirls in Mansoura, Egypt.Regarding menstrual pain the majority of study participants reported severe menstrual pain respectively. This may be rationalized as that many factors are related to this pain. These factors include: age below 20, low body mass index, smoking, early menarche, prolonged or aberrant menstrual flow, pelvic infections, somatization, psychological, and genetic factors; all of these factors can influence it .This comes in agreement with a study performed by Abu Helwa et al, 2018 that assessed prevalence of dysmenorrhea and predictors of its pain intensity among Palestinian female university students. Their findings reveal that students with dysmenorrhea reported 654 (80.34%) having moderate to severe pain and more than half 57.9% reported seeking medications.Moreover, the present findings revealed that the majority of study participants reported that menstrual pain lasted for 9-12 hours. This may be rationalized as that pain perception and expression of pain is influenced by genetics, psychological, developmental, familial, social and cultural factors. Therefore, the aforementioned factors as well as variability of pain threshold of the different categories of respondents who participated in all these studies could account for the differences in the description of their pains. This comes in agreement with a study performed by Abu Helwa et al, 2018 that assessed prevalence of dysmenorrhea and predictors of its pain intensity among female university students in Palestine. Their findings reveal that for the duration of pain, the majority reported having pain in the first day of menses only (44.5%).Moreover, the present findings revealed that the majority of study participants reported pain in lower abdomen and back respectively. This may be rationalized as that pain perception and expression of pain is influenced by many factors as well as variability of pain threshold of the different categories of respondents who participated in all these studies could account for the differences in the description of their pains. This is in agreement with a study conducted in Seoul, South Korea done by Sang Yum, (2017) who found out that regarding the most painful site, 116 students out of 125 complained pain in the lower abdomen, 80 in the back, and 25 in the pelvic area.Regarding to use painkiller the majority of study participants used to use painkiller for menstrual pain respectively. This is a delightful finding and revealed some regional differences in medication use among girls. In some Middle Eastern countries like Palestine, a study performed by Abu Helwa et al, 2018 that assessed prevalence of dysmenorrhea and predictors of its pain intensity among female university students in Palestine there are approximately 58% of dysmenorrheal students with moderate and severe pain selected for medications to decrease symptoms of painful menstruation. The findings of the present study showed that there was a highly statistically significant difference after practicing home based stretching exercises on primary dysmenorrhea in terms of pain intensity, pain duration, and the amount of painkillers used by girls. It is not entirely clear why home based stretching exercises reduce primary dysmenorrhea pain but, the exercise analgesic effect is thought to be applied through nonspecific mechanisms. Dysmenorrhea has a dose-response association with stress. Stress accelerates uterine contractions and menstrual pain. As a result, by decreasing stress and psychological pressures, and enhancing mood, exercise may decrease pain Sheikhhoseini &Shahrjerdi, S, (2012). Moreover, exercise can cause the release of endorphins, which are pain-relieving factors Chenget al, (2011). Another potential mechanism is the improvement of pelvic blood circulation and local metabolism during exercise. Consequently, exercise may prevent prostaglandin accumulation, which results in uterine contraction, ischemia, and pain Bolton et al, (2012).Some believe that stretching exercises can be effective in removing abdominal spasms that stimulate nerve routes Blakey et al, (2010).Many studies have been conducted to investigate the effects of practicing home based stretching

exercises on primary dysmenorrhea in various ways, in an attempt to work out why exactly they are believed to reduce dysmenorrhea pain. One solution is that they have an analgesic effect. By contrast, study conducted in southeast Augusta, Georgia by Metheny et al, (1989), who assess the relationship among exercise, stress, and primary dysmenorrhea. Their findings revealed that menstrual symptom severity increased with regularity in exercise, nearly a 30% increase over being sedentary and there is 30% increase in dysmenorrhea cases among women who performed vigorous exercise. Brown J& Brown S, (2013) suggested that the different results can be due to the use of various exercise protocols or studies with methodological weaknesses. Additionally, the difference in dysmenorrhea type may influence the results and difference in age of participants.In addition, the study of Abaraogu et al (2016) in University of Nigeria Teaching Hospital to investigate effective of exercise therapy on pain and quality of life of patients with primary dysmenorrhe also, demonstrated that exercise intervention caused a statistically significant reduction in pain severity and some other menstrual symptoms.Sheikhhoseini et al, (2012) performed a quasi-experimental design was performed in 2 groups that were selected from 6 secondary schools in Arak, in central Iran on effects of stretching exercises on primary dysmenorrhea . The authors enrolled 519 students had primary dysmenorrhea .Pre and post treatment test scores measured the pain intensity of the primary dysmenorrhea .It is concluded that stretching exercises were effective in decreasing the pain intensity, pain duration, and the amount of painkillers used by girls with primary dysmenorrhea.Ponmathi et al, (2016) also compared the efficacy of aerobic versus stretching exercise programmes over pain and menstrual symptoms in 100 girls with primary Dysmenorrhea in College of Physiotherapy at (SRM) Institute of Science and Technologyin India. Their findings revealed that both the groups achieved equal reducing the physical and psychological symptoms of primary dysmenorrhea. Saleh et al, (2016) also compared the efficacy of core strengthening versus stretching exercise on managing primary dysmenorrhea on 150 participants who came to outpatient clinic complained from painful menstruation of the Zagazig University Hospitals, Egypt and concluded that performing exercise in various forms including stretching and core strengthening safely used as an alternative therapy for pain relief in dysmenorrhea as we are not selling with a disease state but with a functional problem. During the current study, it was found that after practicing the stretching exercises along eight weeks, pain duration and amount of consumed analgesic medications decreased significantly (P1= .000) in the study group as compared to the control group. Also, pain duration during menstrual days reduced significantly from the pretest to the posttest .These results were similar to a study conducted in by Mahvash et al, (2012) to see the effect of physical activity on primary dysmenorrhea among female students at Azad University-Karaj Branch in Iran and concluded that length of menstruation pain was reduced significantly in experimental group after 8 weeks of practicing exercise. Mahvash suggested that mechanism for reducing the length of menstruation pain in post-exercise group is physical activity may help a faster transfer of vast products and prostaglandins as a root of menstruation pain from uterine muscle.

IV. Conclusion

Based on the findings of the present study that investigated the effect of home-based stretching exercises on primary dysmenorrhea among young adolescent girl, it is concluded that: performing 8 weeks of the selected stretching exercises reduces pain intensity, diminishes pain duration, and decreases the consumption of analgesics drugs in students with moderate-to-severe primary dysmenorrhea during the menstruation cycle. Regular stretching exercises can be useful as an easy, accessible, inexpensive approach that yields a positive effect on pelvic alignment. Also they are effective non-medication interventions for improving menstrual pain and dysmenorrhea, which cause discomfort in daily life. This supported the study hypothesis stating that adolescent girls will have less menstrual pain intensity after practicing home-based stretching exercises than before. Based on the present study findings, the research hypothesis was accepted.

V. Recommendations

In the light of the study findings, the following recommendations are proposed:-

1- The school nurse should provide adequate books and magazines which include materials related to menstruation, menstrual care, and stretching exercises to school students.
2- The school nurse should provide health educational sessions to adolescent girls about menstruation, the usual menstrual care, primary dysmenorrhea, healthy lifestyle, exercises and consultation with physiotherapist for the effective relief of pain. Home-based stretching exercises are recommended as an effective treatment method.

Suggestions for future studies:-

1- Comparing the effect of stretching and other type of exercises on primary dysmenohrrea.
2- A further study can be conducted with more samples, different populations and with other menstrual disorders like secondary dysmenohrrea& premenstrual disorder.
3- Evaluating secondary school curricula and integrating items concerning menstruation, dysmenorrhea, and methods of management.

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