Effectiveness of an Educational Program on Female Students' Knowledge toward Premenstrual Syndrome in Secondary Schools in Third Al- Rusafa Education Directorate, Iraq

فاعلية البرنامج التعليمي على معارف طالبات المدارس الثانوية نحو متلازمة ما قبل الطمث في مديرية تربية الرصافة الثالثة، العراق

Sarab Mansoor Mahdi, PhD.*

Suhad H. Khairi, PhD**

---

*Academic Nurse Specialist, High Institute of Health Vocations, Ministry of Health, e-mail: Sarab_Mansoor@yahoo.com.

**Assistant Professor, Maternal and Neonatal Nursing Department, College of Nursing, University of Baghdad, e-mail: suhadhikmat55@yahoo.com.

المستخلص

الهدف: لتقويم فاعلية البرنامج التعليمي في معارف الطالبات تجاه متلازمة ما قبل الطمث.

المنهجية: اجريت دراسة شبه تجريبية تضمنت (140) عينة عمدية مشخصة في أربع مدارس ثانوية في مدينة الصدر (مجموعة الدراسة (70) والمجموعة الضابطة (70) طالبة). تم اختيار مدى انتشار متلازمة ما قبل الطمث بين الطالبات من خلال معايير الكلية الأمريكية لأطباء التوليد وأمراض النساء (2015) قبل البرنامج. تم تنفيذ البرنامج التعليمي في أربع خطوات ، تتمثل الخطوة الأولى (الاختبار المسبق) لتقييم ممارسات الطالبات حول متلازمة ما قبل الطمث قبل تنفيذ البرنامج ، والخطوة الثانية هي تنفيذ البرنامج ومن ثم أجراء اختبارين والفترة الزمنية بين الاختبار الاول والثاني أسبوعين. تم تحديد صدق وثبات الاستبانه من خلال مجموعة من الخبراء ومن خلال دراسة تجريبية لعشرة طالبات. وتم استخدام الاحصاء الوصفي والاستدلالي لتحليل البيانات.

النتائج: تشير نتائج الدراسة إلى أن عدد عينة الدراسة التي تمتلك اعراض متلازمة ما قبل الطمث كان (140) طالبة. كانت هناك فروق ذات دلالة إحصائية عند (0.01 ≥ P- value) بين الاختبار القبلي والاختبار البعدي الأول والثاني وهنالك فرق كبير بين نتائج الاختبار الأول قبل تنفيذ البرنامج والاختبارين بعد تنفيذ البرنامج فيما يخص معارفهن نحو متلازمة ماقبل الطمث ، مقارنة مع المجموعة الضابطة.

التوصيات: أوصت الدراسة بأن تكون هنالك دورات تعليمية مبكرة في المرحلة الابتدائية تتعلق بالطمث، ومتلازمة ما قبل الطمث، وتدابير الرعاية الذاتية لهم.

الكلمات المفتاحية: فاعلية، البرنامج التعليمي، معارف، المدارس الثانوية، متلازمة ما قبل الطمث.

Abstract

Objective: To evaluate the effectiveness of educational program on female students' knowledge toward premenstrual syndrome.

Methodology: A quasi-experimental design study conducing on (140) student purposely in four secondary schools at Al-sadder city (70) student for study group and (70) for control group. The prevalence of PMS selected through American College of Obstetricians and Gynecologists (ACOG) (2015) criterias to select PMS students before program. The education program were set in four steps, the first step (pre-test) is to assess the knowledge , before the implementation of the program, the second step is implementing the program, following two steps post-test I and II between each test two weeks. Validity is determined through a panel of experts, and the reliability of the questionnaire is determined through pilot study of ten students. Data analyzed through descriptive inferential statistics.

Results: The current study indicates that the number of study sample that reported having premenstrual syndrome was (140). There were significant differences at (P- value≤ 0.01) between pretest, posttest I and posttest II. A significant difference results were found between the first test before implementation the program and the two tests after implementation the program regarding their knowledge about premenstrual syndrome, compared to the control group.

Recommendations: The study recommended that early education courses in primary school regarding menstruation, premenstrual syndrome, and self-care measures.

Keywords: effectiveness, educational program, knowledge, secondary schools, premenstrual syndrome.

Introduction

Menstruation is regarded as a normal event in most of females' life through their reproductive age. Some of them affected by problems happened during menstruation, and one of the most common problems is premenstrual tension syndrome (PMTS) which was first indicated by Frank and Harney in 1931, who explained that hormonal disturbances are the main causes of it [1]. Women have known for thousands of years that physical and emotional symptoms related to their menstrual cycle occur. Premenstrual syndrome (PMS) is a group of symptoms come and go in relation to the monthly menstrual cycle. It can be defined as a disorder that occurs during the luteal phase of the menstrual cycle (1 to 2 weeks prior to menses) producing a diverse number of physical and emotional changes. About (5%) of women experience severe symptoms called premenstrual syndrome (PMS), only in the two weeks before their menstrual periods [2]. Premenstrual syndrome (PMS) is one of the most prevalent disorders at reproductive age and has a negative impact on emotions and performance of women. It negatively affects the quality of life of millions of women [3]. It is the emergence of periodic one or more symptoms of symptoms before menstruation and in the first few days of menstruation. A series of factors that affect the health of people, activity, smoking, and food intake are factors associated with lifestyle, and evidence suggests that women and girls with PMS do not have an adequate life span [4]. No study has been previously conducted in regarding educational program toward premenstrual syndrome, that educate of women who are experiencing PMS with those who perceive they are experiencing the syndrome, although they do not meet the clinical criteria of PMS. Along with this, the purpose of this study is to evaluate how many females going to secondary school are aware of the risk factors and the treatment options. The aim is to evaluate the effectiveness of educational program on female students' knowledge toward premenstrual syndrome.

Methodology:-

A quasi-experimental design study was carried out through the application of (pre-test and post-test) approach for the study and control groups. The study was carried-out in four secondary schools at Third Al-Rusafa education directorate in Al-Sadder city which include; Al-Fadila secondary school, Al – Misra secondary school, Al–Rabab secondary school and Al – Estiqama secondary school. Al-Sadder city contains two judicial (first Al-Sadder judicial and second Al-Sadder judicial) .The study conducted in first Al-Sadder judicial and divided to three districts (Al-Markaz, Al-Seddik Al-Akbar, Furat). It is contains seven secondary schools. The study was conducted in four schools, out of seven schools the remaining three schools, two of Al Mutamayizeen schools and does not contain the literary branch and the third school is an evening shift school. The filling of the questionnaire and presentation of program carry on in the computer lab and class room, which contain screen for viewing videos and presentation of the program. The sample of the study non- probability sampling (purposive sample) of (140) female students' (74) students from scientific branch and (66) students literary branch was selected from four secondary schools and based on the study criteria. The sample divided into two group (70) female students (study group) who participated in the educational program and (70) female students (control group)

who didn't participate in the program the groups are almost matched relative to their characteristics. The primary assessment for diagnostic premenstrual syndrome was chose according to American College of Obstetricians and Gynecologists (ACOG)[5] and a questionnaire format and educational program was constructed to assess knowledge and evaluate the effectiveness of educational programs concerning premenstrual syndrome on female student's knowledge. The questionnaire format composed from three major parts as follows (Part one / socio-demographic characteristics, part two / menstrual cycle information, and part three: student's practices about premenstrual syndrome. The validity of the instrument is determined through a panel of (17) experts from in different fields. The pilot study was carried out in December 30th 2018 to January 13th 2019. Ten students in the Al – Estiqama School were participated in the program to determine the reliability of the questionnaire through the use of test and retest approach the duration between two tests was two weeks. The data was collected through the self-reporting technique (pre-test) by using the questionnaire form after obtaining

permission from their families. The data was collected through the period from (December 20th 2018 to the February 27th 2019). Data collection started for (70) student for study group divided in to two group and for control group (70) student divided, into two group. Time needs to filled questionnaire (15-20) minutes. The methods that used in educational program (lectures with the discussion, a booklet containing all lectures, posters, video clips, and measuring devices such as (Tape measure and Digital weight device) for measure (body mass index). Data are analyzed through the use of SPSS (Statistical Process for Social Sciences) version (24) application statistical analysis system and excel application. Statistical data analysis approaches to analyze and interpret the results of the study (Descriptive and Inferential) for data analysis.

Ethical Considerations
The Institutional Review Board (IRB) at the University of Baghdad, College of Nursing approved the study to be conducted. The study protocol meets both the global & the Committee on Publication Ethics(COPE) standards of respecting humans subjects' rights.

Results:

Table (1): Distribution of the Study and Control Group Sample According to the Socio-demographic Characteristics

Variables	Study (N = 70)		Control (N = 70)	
	F	%	F	%
Age/Year				
14	1	1.4	0	0.0
15	3	4.3	0	0.0
16	27	38.6	29	41.4
17	31	44.3	28	40.0
18	7	10.0	7	10.0
19	1	1.4	4	5.7
20	0	0.0	2	2.9
Mean (SD)	**16.89 ± .89**		**13.88 ± 1.0**	
***Monthly Income (Iraqi Dinar)**				
< 200.000	5	7.1	3	4.3

201.000-400.000	12		17.1		10		14.3	
401.000-600.000	13		18.6		26		37.1	
601.000-800.000	23		32.9		21		30.0	
801.000-1.000.000	11		15.7		10		14.3	
> 1.000.000	6		8.6		0		0.0	
Level of education	**Father**		**Mother**		**Father**		**Mother**	
	F	**%**	**F**	**%**	**F**	**%**	**F**	**%**
Unable to read and write	4	5.7	7	10.0	2	2.8	2	2.9
Read and write	6	8.6	3	4.3	13	18.6	**20**	**28.5**
Primary school graduate	8	11.4	15	21.4	4	5.7	4	5.7
Intermediate school graduate	14	20.0	**17**	**24.3**	9	12.9	9	12.9
Secondary school graduate	**16**	**22.9**	**12**	17.2	17	24.3	13	18.6
Diploma	8	11.4	8	11.4	7	10.0	7	10.0
Bachelor's degree and above	14	20.0	8	11.4	**18**	**25.7**	15	21.4
Occupation								
Governmental employee	**47**	**67.1**	11	15.7	**30**	**42.9**	16	22.9
Freelancer	15	21.4	4	5.7	**30**	**42.9**	4	5.7
Retired	2	2.9	3	4.3	2	2.8	0	0.0
Not working/ house wife	6	8.6	**52**	**74.3**	8	11.4	**50**	**71.4**

*Estimated from Ministry of Planning: Central Statistical Organization (CSO)

Table (1) shows that the mean age for students in the study group (16.89 ± .89); less than a half (44.3%) of the sample was reported at age 17-years. Family monthly income around a third (32.9%) of the study group reported that their monthly income ranges between (601.000-800.000 I.D.). As per fathers' level of education, more than a fifth (22.9%) of the study group is secondary school graduates. Concerning mothers' level of education, less than a quarter (24.3%) of the study group are intermediate school graduates. As per occupation fathers' Almost half of the study group (67.1%) is governmental employees. Concerning mothers' occupation, most of the study groups (74.3%) is housewives.

Table (2): Distribution of the Study and Control Group Sample According to the Menstrual History

Variables	**Study (N = 70)**		**Control (N = 70)**	
	Frequency	**Percent**	**Frequency**	**Percent**
Menarche Age (Years)				
9	1	1.4	1	1.4
10	3	4.3	10	14.3
11	10	14.3	22	31.4
12	28	40.0	23	32.9
13	10	14.3	8	11.4
15	16	22.9	6	8.6
16	2	2.9	0	0.0
Mean (SD)	**12.4 ± 1.3**		**11.6 ± 1.2**	

Duration of menstrual flow (Days)				
< 4	5	7.1	8	11.4
4-5	28	40.0	39	55.7
6-7	28	40.0	23	32.9
≥ 8	9	12.9	0	0.0
*Amount of menstrual flow (Pad)				
Mild (≤ 3 pads per day)	41	58.6	4	5.7
Moderate (4-5 pads per day)	20	28.6	45	64.3
Heavy (≥ 6 pads per day)	9	12.8	21	30.0
Menstruation Interval (Days)				
< 28	26	37.1	19	27.1
29-30	25	35.7	28	40.0
> 31	19	17.1	23	32.9
History of PMS in the family				
Yes	26	37.1	13	18.6
No	44	62.9	57	81.4
If yes, who?				
Mother	11	42.3	6	46.2
Sister	7	26.9	7	53.8
Both	8	30.8	0	0.0

*Each soaked normal sized pad hold a teaspoon (5ml) of blood normally to soak (1-7) normal sized pads in whole period [8].

Table (2) shows that the mean age for students of the study group is (12.4 ± 1.3); more than one third (40.0%) reported that they have menarche on the age of 12-years. Duration of menstruation for students of the study group is more one third of the study group (40.0%) reported that their menstruation lasts for 4-5-days and 6-7-days for each of them. Menstruation amount for students of the study group is more than a half (58.6%) reported that their menstruation is mild. Menstruation interval for students of the study group is more than a third of the study group (37.1%) reported that their menstruation interval is less than 28-days. History of PMS in the family for students of the study group is more than a third (37.1%). Lastly, more than two-fifth of those in the study group (42.3%) who reported that there is such a history reported that their mothers experiences' with PMS.

Table (3): Distribution of the Study and Control Group Sample According to their Knowledge throughout the Different Periods of Applying Educational Program (n-70)

List	Domains Items	Pretest			Posttest			t-test	P-value
		MS	R.S%	Ass.	MS	R.S%	Ass.		
1.	**Genital system**	2.21	73.5	L	2.97	99.29	H	-7.325	.000(HS)
2.	**PMS Definition**	1.91	63.6	L	2.84	94.6	H	-8.287	.000(HS)
3.	**PMS Causes**	1.41	47.0	L	2.95	98.4	H	18.124	.000(HS)
4.	**PMS Risk factors**	1.83	61.0	L	2.89	96.47	H	-9.072	.000(HS)
5.	**Physical Symptoms**	1.89	63.2	L	2.90	96.75	H	-8,925	.000(HS)

6.	Psychological Symptoms	1.96	65.42	L	2.52	84	M	-8.914	.000(HS)
7.	Mental symptoms	1.95	65.22	L	2.97	99	H	-8.972	.000(HS)
8.	Complication of PMS	1.71	57.17	L	2.90	96.84	H	-17.749	.000(HS)
9.	Effects of PMS on female student	1.77	59.05	L	2.91	97.11	H	-10.38	.000 (HS)
10.	Importance of exercise	2.00	66.88	L	2.93	97.88	H	-17.965	.000 (HS)

Ass.= Assessment, L= Low (R.S = less than 75%), M= Moderate (R.S = 75 % - 87.5%), H= High (R.S = 87.6% – 100%), MS = Mean Score, R.S = Relative Sufficiency, t = t-test, HS = Significant at P- value ≤ 0.05

Table (3) shows that the mean of score of pretest is lower than posttest and throughout of the result posttest is higher than the pretest at p value for statistic (p 0.05) which is a statistically high significant result.

Table (4): Descriptive Statistics for the Values of the Study and Control Group Knowledge Over Time (n=70)

Domains	Pretest				Posttest 1				Posttest 2			
	Mean		SD		Mean		SD		Mean		SD	
	S.G	C.G	S.G	C.G	S.G	C.G	S.G	C.G	S.G	C.G	S.G	C.G
1. genital system	17.70	12.81	5.33	4.05	23.02	12.68	1.37	4.09	23.85	12.68	0.45	4.09
2.Definition of PMS	1.91	1.47	0.86	5.31	2.84	1.48	0.36	5.26	3.11	1.48	2.44	5.27
3. Causes of PMS	7.30	6.48	2.36	2.16	12.84	6.55	1.90	2.24	14.77	6.55	1.03	2.24
4. Risk factors of PMS	12.85	6.48	4.46	2.16	20.28	6.55	2.40	2.24	20.90	6.55	0.54	2.24
5. Physical symptoms	28.50	21.44	8.38	4.34	42.50	21.17	2.87	4.53	43.60	21.17	4.22	4.53
6.Psycho smptoms	13.77	8.20	5.46	2.42	20.60	8.05	1.19	2.35	20.68	8.05	0.98	2.35
7. Mental symptoms	5.87	3.58	2.54	1.12	8.77	3.54	0.54	1.13	8.87	3.54	0.33	1.13
8.Complication	22.35	15.22	7.33	3.25	37.05	15.71	2.94	3.19	37.62	15.22	3.07	3.45
9. Effects of PMS	8.67	7.81	0.63	2.47	10.66	7.94	3.92	2.60	17.55	7.94	1.18	2.60
10.Importanceexercise	6.02	4.35	2.40	1.70	8.01	4.37	1.36	1.72	8.67	4.37	0.63	1.72
-Over all Knowledge	12.49	8.78	3.98	2.89	18.66	8.80	1.89	2.94	19.96	8.76	1.49	2.96

S.G: Study Group, C.G: Control Group, SD: Standard Division

The values of the students' knowledge about the overall knowledge for the study group noticeably increase by time compared to the control group (Pretest = 12.49 vs. 8.78, Posttest II = 18.66 vs. 8.80, Posttest II = 19.96 vs. 8.76) respectively. Higher score means better knowledge about the domains over time.

Table (5): Sources of Knowledge for Study and Control Group about Premenstrual Syndrome

Source	Study group		Control group	
	Frequency	Percent	Frequency	Percent
Media	7	10	10	14.2
School curricula	6	8.6	**23**	**32.9**
Relatives	7	10	4	5.7
Family	**31**	**44.3**	11	15.7
Friends	12	17.1	13	18.6
Healthcare professionals	7	10	9	12.9

The most reported source of knowledge about PMS for study group is family (n = 31; 44.3 %), followed by friends (n =12; 17.1%), media (n =7; 10%), relatives (n =7; 10%), healthcare professionals (n =7; 10%), and school curricula (n =6; 8.6%). For the control group, the most (n = 23; 32.9 %) reported source is school curricula, followed by friends (n = 13; 18.6%), family (n = 11; 15.7 %), media (n = 10; 14.2 %), healthcare professionals (n =9; 12.9 %), and relatives (n = 4; 5.7 %).

Discussions:

Part I: Socio-demographic Characteristics of the Study Sample Table (1)

Regarding to the student's age the study sample aged 17 years old (16.89 ± .89). Concerning to Family monthly income, around one third of them reported that monthly income is ranges between (601.000-800.000 I.D) (32.9%) approximately (400-600) US Dollars, more than half (55.7%) of study sample from their point of view considered as some sufficient. Concerning to educational level of the study sample mothers are intermediate school graduated (24.3%).

Part II: Reproductive History (Table 2)

In respect to student age on menarche the mean age for students in the study group is (12.4 ± 1.3); more than one third (40.0%) reported that they have menarche on the age of 12-years. Most girls reached menarche between 12-13 years (minimum of 9 years and maximum of 17 years) [10] [11]. More than one third (40.0%) of the study group reported that their menstruation lasts for (4-5-days and 6-7-days) respectively which considered normal duration [12]. Regarding to

While their fathers graduated from secondary school (22.9%). The majority (67.1%) of study groups father are governmental employee, for mothers occupation for study group the majority (74.3) is house wife [6][7][8][9]. Finally, Adolescence is an important and vulnerable period between childhood and adulthood. It is a common menstrual problems in adolescents and should be treated as dysmenorrhea according to Iraq circumstances that occur previously (war and economic sanctions....etc.), these may causes and since stress associated with PMS, this may play and increased PMS according to these factors.

menstruation amount the highest percentage (58.6%) of the study group reported that their menstruation is mild. The findings of the study agree with this study who reveals that more than three quarter of the studied sample (83.7%) had normal amount of the menstrual bleeding [10]. Regarding to menstruation interval the result shows that highest percentage (37.1%) of the study group reported that their menstruation interval is less than 28-days and 29-30-days respectively which considered as a normal interval [12]. Regarding to history of PMS in the family more than one third (37.1%) of the study group

reported that there is previous family history especially their mothers (42.3%). The findings of this study agree with this study who mention that

Part III: Assessment of knowledge toward PMS through the Period of the Program (Pre, Post Test) Table (3)

The result of the table (3) indicated to summary of the subjects responding at the items level that are done by using the observed frequencies for the initial responding of questionnaire's items, and since average of post-test is higher than the average of pre-test at P.value for statistic (p < 0.01) which is the significant result, this result shows that the program is effectively improve knowledge for the study sample throughout the time. in the pre-test,

Part IV: The Values of the Study and Control Group knowledge about Domains over Time Table (4)

The result of table (4) indicated that the overall Knowledge about domains over time for the study group noticeably increase by time (Pretest =12.49, Posttest II =18.66, Posttest II =19.96). For the control group, such values slightly decrease by time (Pretest =8.78, Posttest II =8.80, Posttest II =8.76) the lack of knowledge in control group due to the effectiveness of the educational program for study group comes from the control group findings of no significant differences between pre and post total PMS knowledge scores. As rational the overall knowledge of PMS had significantly increase knowledge and can help adolescent girls to manage their PMS symptoms in future. The study tried to evaluate the effect of education program regarding this knowledge toward premenstrual syndrome. These results are comparable with the study which mention that studied the efficacy of educational program in increasing the knowledge

there are relationship between PMS and addressed reproductive factors which significantly associated risk factor was family history of PMS[4][8][13]. Level of physiological symptoms Mean is (55.4, SD 5.83) and Mean percentage (79.1%), Level of emotional symptoms Mean is (19, SD 5.21) and Mean percentage (76%), Level of behavioral symptoms Mean is (21.4, SD 4.89) and Mean percentage (71.3%), Over all pretest level Mean is (95.8, SD 6.79) and Mean percentage (76.6%). The results of study agreement with this study mentions that (53.3%) were had moderate symptoms during pretest but during posttest (8.3%) of the students had moderate symptoms and (20%) of students had only mild symptoms of premenstrual syndrome [10][12].

and decreasing the severity of symptoms of PMS and found that there is significant improvement in PMS symptoms in the study group when compared to the control group. This result reflected that, the educational program has positive effect in relieving the premenstrual syndrome. This is may be due to increasing in their knowledge regarding the causes of PMS symptoms and teaching them this may play a big role in reducing the severity of the symptoms [4]. Also, this study mentions that a reduction in PMS symptoms severity after application of the program. They suggested that, the education program could have been the source of the reduction in PMS symptoms of the experimental group of young adolescents girls, the study mention that after the intervention, the experimental group showed a significant increase in PMS knowledge (Z=6.32, p=.000) compared to the control group. After the intervention the experimental group showed a significant increase in PMS knowledge (Z=-4.64, p=.000) than before the intervention [14][15].

Part V: Sources of Knowledge for Study and Control Group about Premenstrual Syndrome (Table 5)

The result of the table (5) the highest percentage (n = 31; 44.3 %) of the study sample reported that they know PMS information from their families in compare with the control group (n = 23; 32.9 %) who reported that the source of knowledge is school

- The study recommended that health education programs regarding PMS and other menstrual problems could be included in the curriculum of secondary schools to bring down the prevalence of such problems.

-More school health interventions medical and health follow up for students to learn how to manage

curricula, the result of the study agree with study that indicated only (44.6%) (n=577) of respondents had ever obtained information about PMS, of these, the majority obtained information about PMS from their mothers (31.7%), followed by magazine and newspaper sources (23.4%), peers (22.5%), teachers (17.7%), radio and TV (6.1%), and the Internet (3.4%)[16].

Recommendations:

depression and decreasing the severity of symptoms.

 - Further research that helps in identifying the physical and psychological health needs of adolescent girls would be important to reduce impact of such case on schooling performance.

References:

on premenstrual syndrome in adolescent school girls, International Journal of Reproduction, Contraception, Obstetrics and Gynecology, Mar; 3(1):168-171, www.ijrcog.org.

1. Jasim M. W., (2018). Assessment of the Clinical Features Associated with Premenstrual Tension Syndrome among Kirkuk Technical Institute Students with Possible Preventive Strategies, Medical Journal of Babylon, Volume 15, Issue 1, January-March, http://www.medjbabylon.org. pp: 69.

5. American College of Obstetricians and Gynecologists (ACOG), (2015), Premenstrual Syndrome, Women's Health Care Physicians, https://www.acog.org.

2. Habib F., Allayed A., Al Humedi H., and Al Msalem I., (2014). Impact of an Educational Session about Premenstrual Syndrome Management Using Complementary and Alternative Medicine on Young Adult females' knowledge and Practice, IOSR Journal of Nursing and Health Science (IOSR-JNHS), Volume 3, Issue 2, PP: 63, www.iosrjournals.org.

6. Abeje A. and Berhanu Z., (2019). Premenstrual syndrome and factors associated with it among secondary and preparatory school students in Debremarkos town, North-west Ethiopia, 2016, BMC Research Notes volume 12, Article number: 535.

3. Zendehdel M. and Elyasi F., (2018). Biopsychosocial etiology of premenstrual syndrome: A narrative review, US National Library of Medicine, National Institutes of Health, Journal Family Med Prim Care, volume (7), Number (2).

7. Arslantaş H., Abacigil F., Çinakli S., (2018). Relationship between premenstrual syndrome and basic personality traits: a cross-sectional study, Sao Paulo Med J.; 136 (4):339-45.

4. Ramya S., Rupavani K., Bupathy A., (2014). Effect of educational program

8.Rad M., Sabzevary T. M., and Dehnavi M. Z., (2018). Factors associated with premenstrual syndrome

in Female High School Students, Journal of Education and Health Promotion, volume 7, (May 3.), Number (64).

9. Buddhabunyakan N., Kaewrudee S., Chongsomchai C., Soontrapa S., Somboonporn W., Sothornwit J., 2017. Premenstrual syndrome (PMS) among high school students, Journal Women's Health, Jul 21; 9: 501-505. doi: 10.2147/IJWH.S140679.

10. Mohib A., Zafar A., Najam A., Tanveer H., and Rehman R., (2018). Premenstrual Syndrome: Existence, Knowledge, and Attitude among Female University Students in Karachi, Cureus Journal, Mar; V. 10(3): e2290.

11. Nisar N., Zehra N., Haider G., and Munir A. A., (2008). Frequency, Intensity and Impact of Premenstrual Syndrome in Medical Students, Journal of the College of Physicians and Surgeons--Pakistan: JCPSP 18(8):pp: 481.

12. Patel B. S., (2017). A Study to Evaluate the Effectiveness of Guided Imagery Technique in Alleviating Premenstrual Syndrome among First Year B.Sc. Nursing Students in Selected Nursing Colleges at Bangalore, Asian J. Nursing Edu. And Research 7(3): July-September, www.anvpublication.org.

13. Seedhom E. A., Mohammed S. E., and Mahfouz M. E., (2013). Life Style Factors Associated with Premenstrual Syndrome among El-Minia University Students, Egypt, ISRN Public Health, Volume 2013, Article ID 617123, pp: 6.

14. Ather A., (2014). Effects of health education program on teenagers with premenstrual syndrome, EPMA Journal, volume 5 (Suppl1):A158, http://www.epmajournal.com/content/5/S1/A158.

15. Mohamed M. S., Mohamed A. K., Mohamed I. I., and Abd Elhameed A.

N., (2018). Premenstrual syndrome and quality of life among Sohag University female students, Assiut Scientific Nursing Journal, Vol (6), No (13) April.

16. Wong L., (2011). Attitudes toward Menstruation, Menstrual-Related Symptoms, and Premenstrual Syndrome Among Adolescent Girls: A Rural School-Based Survey, Women & Health Journal, Volume 51, 2011 - Issue 4.