Relationship between Menstruation Signs and Anxiety, Depression, and Stress among Adolescent Girls at Assiut City

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Abstract: *Intense physical and psychological changes define the symptoms of menstruation. The most common symptoms include anxiety, depression, pressure on the symptoms impact women's quality of life and impairment in many aspects of life..Aim of the study: to define the association between menstruation signs and anxiety, depression, and stress among adolescent school girls. Subject and Methods: Cross sectional descriptive design was used in this study. The study included 600 students from public and private preparatory schools for girls at Assiut city. Four schools were selected randomly which namely; El-waledia, HodaSharawy, Dar-Heraa and Elslam schools. Three tools were used to accomplish this work. Tool IA structured Questionnaire was developed by the investigators and included two parts: Part I: personal characters; Part II: data related to menstruation: Tool II: Menstrual Distress Questionnaire (MDQ), Tool III: Depression, Anxiety, and Stress Scale (DASS).Fieldwork: Data was collected in the period from the middle of February 2019 until the middle of May 2019. Results: half of the studied students 42% were age less than 15 years old with mean ± SD 14.80 ± 1.38, 44.2% of them menstruation duration less than 5 days with mean ± SD 4.85 ± 1.63. More than half of them (58%) within normal body weight. Nearly two third of them (71.8%, 60.5%) had average regular menstruation rhythm with premenstrual pain (63.7%). The majority of them did not complain from either bleeding nor breast engorgement (87.3%, 83.0%) respectively. (74.5%, 53.2% and 50.5%) of them had mood swings, depression and acne respectively. There is statistically significant difference between level of severity of distress before during and after menstruation p 0.000.There is a significant correlation between menstrual distress before, during and after menstruation and depression, anxiety and stress at p=0.000. Conclusions and recommendations: high prevalence of increased signs of menstruation before, during and after menstruation, as well as the high incidence of signs of depression, anxiety and stress among students. Research using longitudinal studies with ongoing evaluation and evaluation of educational interventions for adolescent girls with menstrual severity-related psychological problems would be of great value in primary health promotion. Early diagnosis, reassurance and management of symptoms will go a long way towards smoother passage of adolescence into stable adult identity formation.*

Keywords: *menstruation signs, anxiety, depression, stress, Adolescent Girls*

1. INTRODUCTION

There are menstrual disorders among women at different ages. These disorders are more prevalent among girls in early puberty, especially during the first 2 years of menstruation, where many periods are ovulation-free.

One of the most common disorders at this time are menstrual symptoms (Flug et al 2000) that include irritability, tender breasts, low back pain, skin outbreaks, tiredness, palpitation, social isolation, nausea and vomiting, abdominal pain (cramps) and general weakness (Zegeye et al, 2009) that occur before, during, or after menstrual period. (Thomas and Narayanan, 2006) the prevalence of these signs was documented by retrospective and prospective research over 60% and 23-67% respectively. Such symptoms influence not only the quality of life, but are also the main reasons for the school absenteeism of adolescents and teenagers. Based on the menstrual cycle phases and societies, the intensity and frequency of menstrual signs vary,

according to the World Health Organization (WHO) study, menstrual signs are more common in Asian countries than in Western countries(Carr-Nangle et al, 2006). Based on a biopsycho-social model, menstruation-related signs are affected not only by biological factors such as hormonal disorders and lifestyle (sport and nutrition) but also by environmental and social factors such as contact with peers, family and colleagues and menstrual and psychological factors such as anxiety, depression, and stress (Davydov et al,2005) Psychological disorders may activate corticotrophin releasing hormone (CRH) from the nervous system, accompanied by elevated cortisol and prolactin, resulting in signs of menstruation(Lee et al, 2009).

Today, more effort is being made to evaluate the menstruation issues of adolescent girls in terms of improving the health status of individuals, including physical and psychological well-being. Several scholars argue that ignoring signs of menstruation in adolescence can have an effect on the health and quality of life (Halas, 1987; Wilson and Keye, 1989). An adolescent can develop an altered image of the body, decrease in self-esteem, lack of self-confidence, and ultimately affect relationships with significant others. When these effects reach adulthood, deterioration of engagement, marital distress and difficulty in pursuing educational goals or withdrawal and social isolation can result (Wilson and Keye, 1989).Thus the study aimed to define the association between menstruation signs and anxiety, depression, and stress among high school girls.

1.1. Aim of the study

The aim of this study was to define the association between menstruation signs and anxiety, depression, and stress among adolescent school girls.

1.2. Research Question

- Is there a relationship between menstruation symptoms and depression, anxiety, and stress among adolescent girls at Assiut city?

- What is the level of Depression, Anxiety, and Stress Scale during menstruation symptoms among adolescent girls at Assiut city?

2. SUBJECT AND METHOD

This is a cross-sectional study conducted on 600 governmental school girls in the school year 2018.

2.1. Setting

This study was conducted in the public and private preparatory schools for girls at Assiut city. The total number of these schools were (32); it's divided into West city included (11) schools and East city included (21) schools; four schools were selected randomly which namely; El-waledia, HodaSharawy, Dar-Heraa and Elslam schools

2.2. Sampling

The students were selected using convenient sampling technique.

2.3. Sample size

The total number of students in the selected schools were1145; sample size was calculated by using Epi info version 3.3withexpected frequency of 50% and confidence level 99.9%; the estimated sample size was (557) ; to avoid dropout the sample size expand to become (600).

3. TOOLS

Three tools were used to accomplish this*after* reviewing the relevant literature to elicit information; the researchers design self-administer questionnaire that included the following: personal characteristics, data related to menstruation cycle,Menstrual Distress Questionnaire (MDQ) and Depression, Anxiety, and Stress Scale (DAS).

3.1. Tool I

It divided into two parts

- **Part (1):** it included personal characteristics of the students' age, level of education, Weight and Height.

- **Part (2):** it included data related to menstruation cycle as No. of day, amount, regularity, pain, breast engorgement, mood swings, overweight and acne.

3.2. Tool II

Menstrual Distress Questionnaire (MDQ), Rudolf Moos' MDQ (1986) was designed in New York University (Kordi etal, 2011). This questionnaire is scored a four-point Likert scale (no sign = zero, very severe = 4) and contains 16 questions in four dimensions [pain, control, autonomic reactions, and (water) weight gain], and records the menstrual signs a week before menstruation, during bleeding, and a week after menstruation. A score of ≤16 is given for minor

menstruation signs, 17 < score <32 for moderate menstruation signs, and 33 < score <48 is for acute menstruation signs. Scores over 49 were considered for very acute menstruation signs.

3.3. Tool III

Depression, Anxiety, and Stress Scale (DASS) (Lovibond & Lovibond, 1995) this questionnaire contains 21 questions measuring depression (7 questions), anxiety (7 questions), and stress (7 questions).These questions are scored by a four-point Likert scale: "never" (zero) to "very much" (three). The depression-related questions were questions 17, 16, 13, 10, 5, 21 and 3, anxiety-related questions were 20, 19, 15, 9, 7, 4, and 2, and stress-related questions were 18, 14, 12, 11, 8, 6, and 1. A score of 5-6 showed minor depression, 7-10 moderate, 11-13 acute, and over 14 showed very acute depression.

3.4. Validity& Reliability of the tools

- Validity of tools: to evaluate the content validity of the tools .It was reviewed by three academicexperts in medical and nursing science to measure validity; all comments and suggestions were done.

- Reliability of tools: to evaluate the tool reliability was analyzed by Cronbach's alpha to measure reliability which was 0.881

4. PROCEDURE

- Administrative phase: An official approval letters were obtained from the Dean of Faculty of Nursing, Assiut University to Ministry of Education and to directors of selected schools. These letters includes a permission to carry out the study and explains the purpose and nature of the study.

- Pilot study: Before the start of data collection, a pilot study was conducted on (10 percent) of the participants, which included some adjustment in the research sample for non-presence. The goal of the

pilot study was to ensure the clarity of the products and the applicability and relevance of the tools, In addition to recognizing hurdles and issues that may arise during data collection; also checking wording questions and calculating the time required for research sample collection.

- Data was collected in the period from the middle of February 2019 until the middle of May 2019.

- The researchers first introduced themselves for the participants, explained the purpose of the study and getting their oral consent. Then the sheet was distributed to be answered within (25-30 minutes) according to the participants' response.

- It consumed around 3 months through two days weekly for collecting the questionnaire sheet; every week about (25), sheets were collected.

4.1. Ethical Considerations

The research proposal was approved by the Faculty of Nursing at Assiut University's ethical board. During the implementation of research, there was no risk of study topic, the study followed standard ethical principles in clinical research, Oral consent was obtained from students who participated in the study after specifying the nature and purpose of the study, privacy and anonymity, and study participants were allowed to reject or withdraw from the study.

4.2. Statistical design

Upon completion of data collection, data entry was done using Epi-Info 6.04 computer software package, while statistical analysis was done using SPSS 16.0 statistical software packages. Data were presented using descriptive statistics in the form of means and standard deviations for quantitative variables.

5. RESULTS

Table1: *Distribution of demographic data among study sample (No=600)*

	No. (600)	%
Age: (years)		
< 15	252	42.0%
15 - 16	134	22.3%
> 16	214	35.7%
Mean ± SD (Range)	14.80 ± 1.38 (12.0 – 22.0)	
Educational level:		
Preparatory	378	63.0%
Secondary	222	37.0%

BMI:		
Underweight	84	14.0%
Normal	348	58.0%
Overweight	142	23.7%
Obese	26	4.3%
Menstrual duration: (days)		
< 5	265	44.2%
5 - 6	222	37.0%
≥ 7	113	18.8%
Mean ± SD (Range)	4.85 ± 1.63 (1 – 12)	
Menstrual rhythm:		
Regular	363	60.5%
Irregular	237	39.5%
Pain:		
Present	488	81.3%
Absent	112	18.7%
Pre-menstrual pain:		
Present	382	63.7%
Absent	218	36.3%
Amount:		
Heavy	121	20.2%
Average	431	71.8%
Little	48	8.0%
Breast engorgement:		
Present	102	17.0%
Absent	498	83.0%
Bleeding:		
Present	76	12.7%
Absent	524	87.3%
Mood swings:		
Present	447	74.5%
Absent	153	25.5%
Depression:		
Present	319	53.2%
Absent	281	46.8%
Overweight:		
Present	88	14.7%
Absent	512	85.3%
Acne:		
Present	303	50.5%
Absent	297	49.5%

Table 1 This table show that nearly half of the studied students 42% were age less than 15 years old with mean ± SD14.80 ± 1.38, 44.2% of them menstruation duration less than 5 days with mean ± SD4.85 ± 1.63. More than half of them (58%) were within normal body weight. Nearly two third of them (71.8% and 60.5% respectively) had average regular menstruation rhythm with premenstrual pain (63.7%). The majority of them did not complain from either bleeding nor breast engorgement (87.3% and 83.0% respectively). Finally, (74.5%, 53.2% and 50.5% respectively) of them had mood swings, depression and acne.

Table2: Severity *of menstruation distress before during and after menstruation among the study sample*

Menstrual distress	**Before (n= 600)**		**During (n= 600)**		**After (n= 600)**		**P-value[1]**	**P-value[2]**
	No.	**%**	**No.**	**%**	**No.**	**%**		
Minor menstruation signs	302	50.3	202	33.7	186	31.0	0.000*	0.000*
Moderate menstruation signs	229	38.2	309	51.5	349	58.2		
Acute menstruation signs	59	9.8	81	13.5	59	9.8		
Very acute menstruation signs	10	1.7	8	1.3	6	1.0		

Table 2 This table reveal that the severity of menstruation distress before during and after menstruation there is statistically significant difference between level of severity of distress before during and after distress at p 0.000*
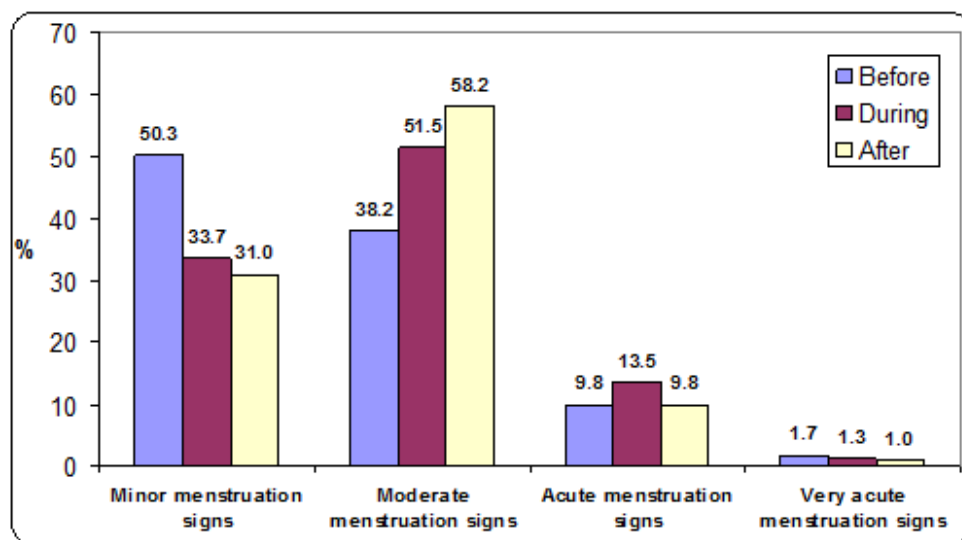
Figure 1: *the severity of menstruation distress before during and after menstruation among study sample*

Figure 1 This figure clarify that the severity of menstruation distress in minor menstruation signs increased before, then decrease during and become more intense after (50.3, 33.7, and 31.0 respectively). While, in moderate menstruation signs the severities started mild then moderate and finally sever after menstruation (38.2, 51.5, 58.2 respectively). Finally, the acute menstruation signs were vague in severity.
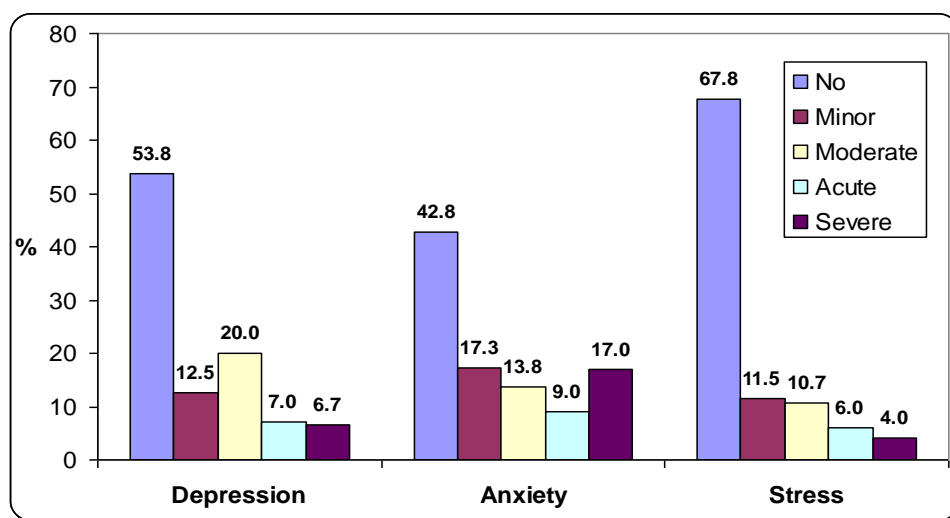
Figure 2: *the relation between anxiety, depression and stress of students during menstruation.*

Figure 2 this figure shows that the relation between anxiety, depression and stress of students during menstruation. It revealed that during menstruation, the students with moderate menstruation signs had more depression (20%) than anxiety and stress (13.8% and 10.7%, respectively).While the students with minor menstruation signs were more anxious (17.3) than depression and stress (12.5%, 10.7%respectively.

Table 3: *Correlation of menstrual distress before, during and after menstruation with depression, anxiety and stress scores*

Menstrual distress	Depression		Anxiety		Stress	
	r-value	P-value	r-value	P-value	r-value	P-value
Before menstruation	**0**.508	0.000*	0.500	0.000*	0.479	0.000*
During menstruation	0.467	0.000*	0.445	0.000*	0.457	0.000*
After menstruation	0.488	0.000*	0.460	0.000*	0.474	0.000*

Table 3 this table shows that there is a significant correlation between menstrual distress before, during and after menstruation and depression, anxiety and stress at p=0.000*
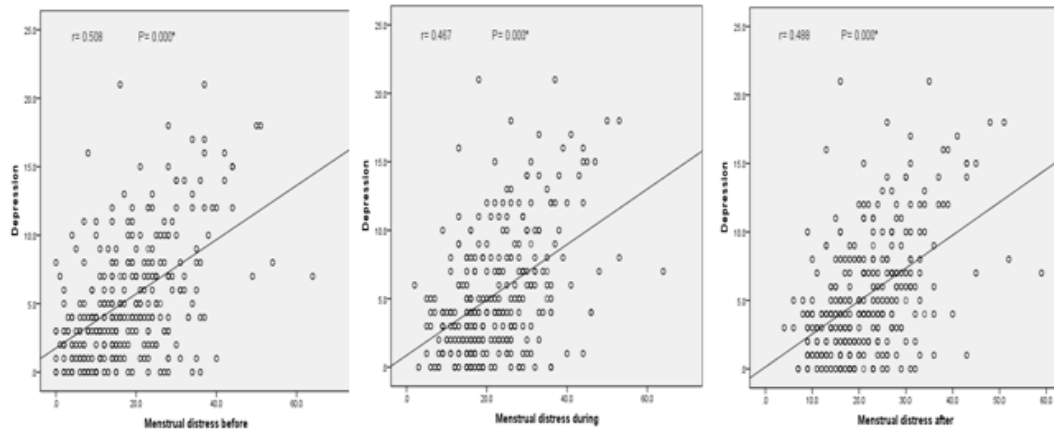
Figure 3: *Correlation between depression score and menstrual distress before, during and after menstruation*

Figure 3 described the correlation between depression score and menstrual distress before, during and after menstruation. There was a positive correlation between the depression score, and menstrual distress before, during, and after menstruation, therefore a higher intensity of menstruation distress lead to increased depression with highly statistically significant differences before, during and after (P=0.000 / r=0.508, P=0.000/ r=467, P=0.000 / r=488respectively).
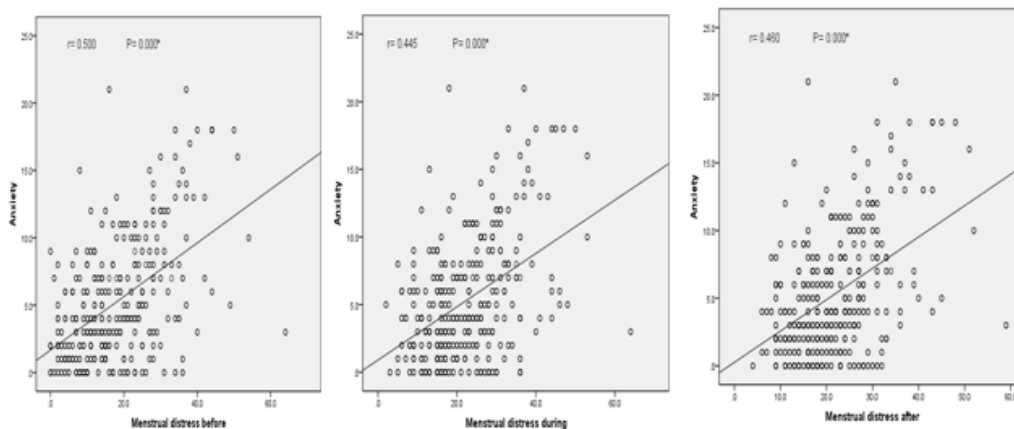

Figure 4: *Correlation between anxiety score and menstrual distress before, during and after menstruation*

Figure 4 described the correlation between anxiety score and menstrual distress before, during and after menstruation. There was a positive correlation between the anxiety score, and menstrual distress before, during, and after menstruation, therefore a higher intensity of menstruation distress lead to increased, anxiety, with highly statistically significant differences before, during and after (P=0.000 / r=0.500, P=0.000/ r=455, P=0.000 / r=460respectively).
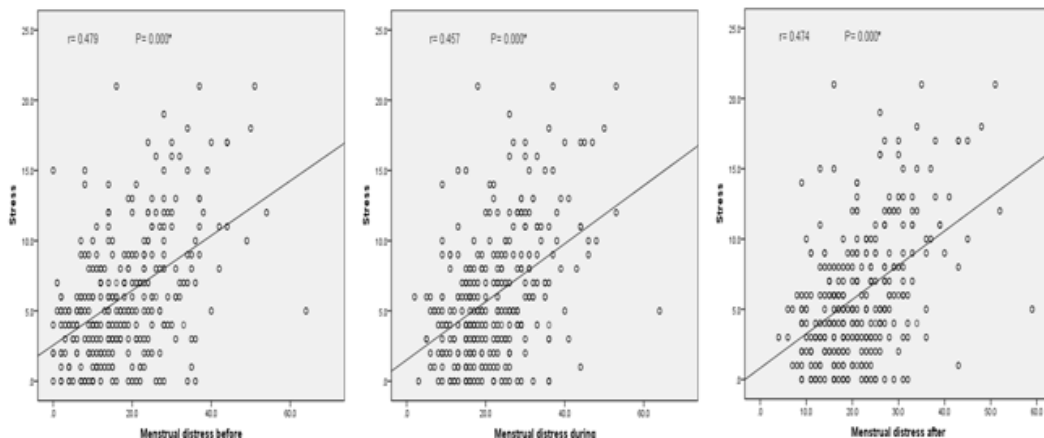

Figure 5: *Correlation between stress score and menstrual distress before, during and after menstruation*

Figure 5 described the correlation between depression score and menstrual distress before, during and after menstruation. There was a positive correlation between the stress scores and menstrual distress before, during, and after menstruation, therefore a higher intensity of menstruation distress lead to increased stress with highly statistically significant differences before, during and after (P=0.000 / r=0.479, P=0.000/ r=457, P=0.000 / r=474respectively).

Table 4: *Relation between DAS (yes, No) and menstrual distress categories) (before, during and after with: Severity of menstruation*

Menstrual distress	Depression		No depression		Anxiety		No anxiety		Stress		No stress	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Before menstruation												
Minor	79	26.2	223	73.8	123	40.7	179	59.3	50	16.6	252	83.4
Moderate	144	62.9	85	37.1	161	70.3	68	29.7	95	41.5	134	58.5
Acute/ very acute	54	78.3	15	21.7	59	85.5	10	14.5	48	69.6	21	30.4
P-value	0.000*				0.000*				0.000*			
During menstruation												
Minor	54	26.7	148	73.3	84	41.6	118	58.4	26	12.9	176	87.1
Moderate	155	50.2	154	49.8	184	59.5	125	40.5	107	34.6	202	65.4
Acute/ very acute	68	76.4	21	23.6	75	84.3	14	15.7	60	67.4	29	32.6
P-value		0.000*			0.000*				0.000*			
After menstruation												
Minor	46	24.7	140	75.3	74	39.8	112	60.2	28	15.1	158	84.9
Moderate	177	50.7	172	49.3	212	60.7	137	39.3	111	31.8	238	68.2
Acute/ very acute	54	83.1	11	16.9	57	87.7	8	12.3	54	83.1	11	16.9
P-value	0.000*				0.000*				0.000*			

Table (4) illustrated the relation between DAS (yes, No) and menstrual distress categories) (before, during and after with severity of menstruation, its clarified that before menstruation, students with minor menstruation signs majority of them hadn't complain from stress, depression and anxiety (83.4%, 73.8% and 59.3%respectively). While students with moderate menstruation signs nearly two third of them complain from anxiety and depression (70.3% and 62.9%respectively), with no stress (58.5%). As well as students with acute / very acute menstruation signs, majority of them complain from anxiety, depression and stress (85.5, 78.3, and 69.6respectively), with highly statistically significant differences.

During menstruation, the results showed that, Also students with minor menstruation signs majority of them had no signs of stress, depression and anxiety (87.1%, 73.3% and 58.4%respectively). On the other hand, students with moderate menstruation signs more than half of them complain from anxiety and depression (59.5% and 50.2%respectively), with no stress (62.4%). In the same line, students with acute / very acute menstruation signs, majority of them complain from anxiety, depression or stress (84.3%, 76.4, and 67.4respectively), with highly statistically significant differences. After menstruation. As mentioned before, students with minor menstruation signs majority of them had no signs of stress, depression or anxiety (84.9%, 75.3% and 60.2%respectively). On the other hand, students with moderate menstruation signs more than half of them complain from anxiety and depression (60.7% and 50.7%respectively) with no stress (68.2%). In the same line, students with acute / very acute menstruation signs, majority of them complain from anxiety, depression or stress (87.7%, 83.1, and 83.1respectively) with highly statistically significant differences.

6. DISCUSSION

Menstruation is usually a common occurrence during a woman's reproductive life, up to 90% experience one or more signs during the days prior to menstruation, and almost all components of women's normal functioning can be negatively or positively affected by changes in the menstrual cycle process Partoazam, (2009).Nowadays, menstruation sign study and consideration is widely spread and coordinated and is considered an important research topic. Although signs of menstruation are of great

importance, they are still not addressed adequately Navabinejad and Lotfi, (2011). The current study showed that 50% of students 42% were less than 15 years of age. And most students have an average regular menstrual period (71.8%, 60.5%) with premenstrual pain (63.7%) and most of them had mood swings, depression, and acne (74.5%, 53.2% and 50.5%) This result is consistent with Vichin et al, (2006), who estimated that the prevalence of pre-menstruation symptoms was 59% among students aged 13-18 in the United States. In the same line Mohamadirizi and Kordi, (2013) who reported that their study showed a high percentage of students suffering from psychological disorders despite pre-menstrual menstrual pain.

As regarding the severity of menstruation distress the present study revealed that there was nearly half of the students had minor menstruation signs before, during, and after menstruation with statistically significant difference p 0.000*. In the same line of these results, Chen,(2005), and Lee, (2011) reported that most symptoms of menstruation among students are abdominal cramps (46.5%), low back pain (28.4%), acne (21.4%), and tender breasts (17.5%). Also in the Chang and Chen,(2009) which stated that dysmenorrhea, acne, and tiredness were the most common signs. Bakhshani et al, (2009) in her study of 18-28 year-old students in Zahedan, she described low back pain, abdominal bloated feeling, and tender breasts as the most prevalent symptoms of pre-menstruation. The variability in these measures could be correlated with the variety of methods for collecting information, the choice of testing choices and the non-attendance of a widely recognized concept of menstrual frequency.

Furthermore, the students with moderate menstruation signs had depression (20%) more than anxiety and stress (13.8%, 10.7%) during menstruation, while students with minor menstruation signs complain from anxiety (17.3) then depression and stress (12.5%, 10.7%) respectively during menstruation. This observation was supported by the fact that psychological menstrual problem remains a major public health concern among adolescents Mohamadirizi and Kordi (2013) demonstrated similar findings. Meanwhile, the results of the health and disease research project on mental

health among Iranians over the age of 15 reported the prevalence of mental disorders to b21% in the total population of Iran.

In addition, in these results there was a positive correlation between menstrual distress before, during and after menstrual distress and depression, anxiety and stress at p=0.000, hence a rise in menstrual symptoms increased depression, anxiety and stress frequency. Mohamadirizi and Kordi, (2013) and Ionelli, (2010) showed a positive correlation between pre-menstruation signs and depression, anxiety, and stress disorders.

The results of this study showed that there was a positive correlation between depression, anxiety and stress levels, and menstrual distress before, during, and after menstruation, resulting in increased menstrual distress intensity leading to increased depression with highly statistically significant differences before, during, and after menstruation. This can be attributed to women experiencing higher levels of premenstrual or postmenstrual symptoms, but feeling that they have little or no control over such changes, may be more susceptible to depression or anxiety development. Such findings are consistent with the findings of Morse et al. (1988) and Christensen and Oei (1989), who found that women with menstrual symptoms were more likely to develop greater levels of anxiety and depression.

The current study found that most of them had no symptoms of tension, depression or anxiety before, during and after menstruation. While nearly two-thirds of students with moderate signs of menstruation complain of anxiety and depression without stress. As well as students with acute / very acute signs of menstruation, most of them complain with highly statistically significant differences from anxiety, depression and stress. Similar findings have been shown by Vichnin, et al, (2006) who documented more signs of depression, anxiety, and stress in most extreme signs of menstruation. Finally, this study may formulate longitudinal data on menstruation signs and anxiety, depression, and pressure among adolescent girls in Upper Egypt for future research. The advantages of this study included its prospective nature and multi-center analysis, including a fair number of cases. In addition, early detection of menstrual and anxiety, depression, and stress symptoms in adolescent girls leads to early intervention that can reduce psychological issues and improve the quality of life.

Limitations of study: As with any research, there are certain limitations of the study firstly, the nature of data was self-reporting, and it may have resulted in under-reporting of the conditions in few cases. Secondly, lack of students' cooperation, and interference of the study with their school assignments

7. CONCLUSION

We may conclude that with regard to the high prevalence of increased menstrual signs before, during and after menstruation, as well as the high incidence of depression, anxiety and signs of stress among students, research using longitudinal studies of adolescent girls with psychological problems with ongoing assessment and examination of educational approaches. For primary health promotion, study using longitudinal studies of continuous assessment and review of academic strategies for adolescent girls with psychological issues linked to menstrual frequency would be of great value. In addition, a lack of general menstrual awareness as demonstrated in the results and checked by the students themselves suggests a need to expand the curriculum.

RECOMMENDATION

Early diagnosis, reassurance and symptom management will go a long way towards a smoother transition from puberty to healthy development of adult identity. More effective and appropriate interventions should be incorporated into additional programs to help adolescents manage symptoms of depression and menstrual pain.

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