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Menstrual Disorders and Body Mass Index among Adolescent Girls at Secondary School in Baghdad City

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ARTICLEINFO

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Abstract

Background: Scientific evidence indicates that BMI is an important factor affecting irregular menstrual cycles.

Objectives: To assess Body Mass Index among secondary school adolescent Girls and to identify the effect of Body Mass Index on menstrual pattern.

Methodology: A descriptive analytic study has been conducted to adolescent girls from the period of March 6th 2022 to June 8th 2022. A purposive (non-probability) sample which consisted of (150) student's. The sample which collected from Al-Rafidain Secondary School, Haifa Secondary School and AL-Khansa Secondary School. The data has been collected through a questionnaire format through interview with the study sample. Data are analyzed through the use Excel (Statistical package) and Descriptive statistic was used to analyze data.

Results: The results of the study revealed that the highest percentages (150%) at age group (13-21) years, (66.66 %) were Normal BMI (18.50-25Kg/m^2), (56.66%) were drinking and eating everything, (60.66%) were no one in the family's overweight, (73.3 %) at Age of Menarche (11-13) years, (63.33%)of the girls had a normal menstrual cycle, (36.66 %) had frequent periods of 4-7/21 – 28 days with mean and SD is 5.33 ± 1.531. The highest percentages (48%) for study sample were have moderate dysmenorrhea.

The study revealed that the highest mean of score of menstrual disorders signs and symptoms such as pain (abdominal pain (cramps in the lower part of the abdomen)), disturbance and uncomfortable, fatigue, menorrhagia and amenorrhea.

Conclusions: The study concluded that the most adolescent girl's student have normal BMI and have knowledge about menstrual disorders signs and symptoms.

What is already known about the topic? It is known that menstrual disorders, such as irregular cycles and dysmenorrhea, are common among adolescent girls and can be influenced by body mass index (BMI). Both underweight and overweight girls are at higher risk for menstrual irregularities. Hormonal imbalances related to BMI can affect menstrual health, and addressing weight issues may improve menstrual regularity in this population.

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INTRODUCTION

Yesterday's girl is today's adolescent and tomorrow's mother. WHO defines 'Adolescents' as individuals in the 10-19 years' age group and 'Youth' as the 15-24-year age group. While 'Young People' covers the age range 10-24 years. There are about 360 million adolescents comprising about 20% of the population in the countries of the South-East Asia Region (SEAR). Menstrual cycle is a determinant of a woman's reproductive health. Disorders in cycles or its irregularities are a major gynecological problem among female adults especially adolescent and a major source of anxiety to them and their family. Information on a woman's menstrual pattern will aids in clinical evaluation of gynecological problems and will make womanhood easier for adolescent women and adults (Harlow and Campbell, 2004). The transition from childhood to adulthood involves dramatic physical, sexual, psychological and social developmental changes, all taking place at the same time. In addition to opportunities for development this transition poses risks to their health and wellbeing (WHO, 2023). Menstruation is a normal physiological phenomenon among women of reproductive age. Disorders that are usually linked with menstruation affect women from all parts of the world and it's increasingly becoming one of the major reasons for gynecological visits (Ansong et al., 2019). Earlier than average age at menarche has been associated with certain adverse health effects in childhood and Adolescent. These include eating disorders, depression, Substance abuse, sexual exploits and teenage pregnancy (Bhattarai et al., 2018). Among the student population, disturbances arising from menstruation could contribute to absenteeism, exemption from physical exercises and social and emotional distress. Among adolescents however, delayed, irregular, painful and heavy menstruation are extremely common and remain the chief reasons for physician visits (Ansong et al., 2019). This study was conducted to assess Body Mass Index among secondary school adolescent girls and to identify the effect of Body Mass Index on menstrual pattern.

Methodology

Research design: A descriptive analytic study has been conducted to adolescent girls from the period of March 6th 2022 to June 8th 2022.

Sample of study: A purposive (non-probability) sample which consisted of (150) student's.

The sample collected according the student's agreement to participate in the study and the number size of the students in classroom.

Setting of the study: The sample which collected from Al-Rafidain Secondary School, Haifa Secondary School and AL-Khansa Secondary School.

Validity of the Instrument: The validity of the instrument was established through a panel of (9) experts. They were faculty members from College of Nursing University of Baghdad. The experts experience years was 18.33 ± 8.93.

These experts were noted to review the questionnaire format for content relevancy and adequacy. Few recommended modifications were done according to experts' opinions.

Data collection methods: The data has been collected through a questionnaire format through interview with the study sample The questionnaire format is comprised of four parts, Part one: Demographic Characteristics

consists of closed-end questions; it was constructed to collect students age & Body Mass Index.

Part two Food Habits consists of closed-end questions; it was constructed to collect students drinking tea or coffee, eating high-fat foods Junk foods, drinking liquid juices and Is there someone the family is overweight.

Part three Pattern of Menstrual Cycle consists of closed-end questions; it was constructed to collect students age of menarche, regular, frequency, duration of menstrual cycle and dysmenorrhea level and number of pads.

Part Four Symptoms and Signs of Menstrual Disorders such as pain, fatigue, headache, nausea & vomiting…etc.

Statistical analysis

Data are analyzed through the use Excel (Statistical package) and Descriptive statistic was used to analyze data.

A. Descriptive statistical data analysis:

1. Frequencies & Percentage (%)

$$\text{Percentage \%} = \frac{\text{Frequency}}{\text{Sample size}} \times 100$$

2. Mean & Standard Deviation

$$\bar{X} = \frac{\sum X}{N}$$

Where $\bar{X}$ = the mean
$\sum$ = the sum of
X = each individual raw score
N = the number of cases

$$SD = \sqrt{\frac{\sum X^2}{N}}$$

3. Rating & Scoring of the Scale

The part four **Symptoms and signs of menstrual disorders** of Adolescent Girls at Secondary Schoolsabout menstrual disorders questionnaire items were rates and scored to four items as one for not found and two for mild and three for moderate and four for sever, while the numeric values for the negatives items of the scale were 1 for nor found and 2 for mild and 3 for moderate and 4 for sever. Four point Likert scales are used for rating the items as four, three, two and one**.**

$$\text{Cut of point} = \frac{1+2+3+4}{4} = \frac{10}{4} \quad 2.5$$

RESULTS

Table (1): Distribution of the Study Sample according to Socio-Demographic Characteristics.

Age of the study sample: The most study sample at age group (13-21) years with mean age and SD is 15.93 ± 1.932

Concerning the Body Mass Index: The highest percentage (66.67 %) were Normal (18.50-25Kg/m²) with mean age and SD is 22.404 ± 4.585; while the lowest percentage (4.66%)were Obese (≥30 Kg/m²).

Table (2): Distribution of Study Sample According to Student's Food Habits.

shows that the highest percentages (56.66%) were drinking and eating everything.

Concerning the Is there someone the family is overweight: The highest percentages (60.66%) were no one in the family's overweight.

Table (3): Distribution of Study Sample According to Menstrual Cycle.

Age of Menarche: (73.3 %) of the girls had their first menstrual period between

the age of 11 and 13 (mean = 12.60 years, SD of 1.087 years).

Menstrual Pattern: The study sample (63.33%)of the girls had a normal menstrual cycle. (36.66 %) had frequent periods of 4-7/21 – 28 days with mean and SD is 5.33 ± 1.531.

Dysmenorrhea level: The highest percentages (48%) for study sample were have moderate dysmenorrhea.

Number of Pads: The highest percentages (100%) for study sample were use 2-4 pads daily.

Table (4): Distribution of Study Sample According to Student's Knowledge about Symptoms and Signs of Menstrual Disorders.

Table (4) show that the highest mean of score (2.70) in item NO. (1) Pain and (2.59) in item No. (1.1) Abdominal Pain (cramps in the lower part of the abdomen).

The highest mean of score is (2.54) in item NO. (2) Disturbance and uncomfortable; (2.57) in item No. (3) Fatigue, (2.58) in item No. (6) Vertigo. The highest mean of score is (2.55) in item NO. (7): Abdominal distension, and (2.85) in item No. (10) Menorrhagia, (2.62) in item No. (11) Amenorrhea, (2.60) in item No. (13) Desire to sleep.

Table (1): Distribution of the Study Sample according to Socio-Demographic Characteristics.

Socio-Demographic Characteristics	Student's (n=150)	
Age	**No.**	**%**
13-21	150	100
X± SD	15.93 ± 1.932	
BMI		
Normal(18.50-25Kg/m^2)	100	66.67
Underweight(≤18.50 Kg/m^2)	22	14.66
Overweight(25-30 Kg/m^2)	21	14
Obese(≥30 Kg/m^2)	7	4.66
X± SD	22.404 ±4.585	

Table (2): Distribution of Study Sample According to Student's Food Habits.

Items	Student's (n=150)	
	No.	**%**
Drinking tea or coffee	12	8
Eating high-fat foods	12	8
Junk foods	24	16
Drinking liquid juices	17	11.33
All of above	85	56.66
Is there someone the family is overweight		
Yes	59	39.33
No	91	60.66

Table (3): Distribution of Study Sample According to Menstrual Cycle.

Items	Student's (n=150)	
Age of Menarche	**No.**	**%**
≤ 10	7	4.7
11 – 13	110	73.3
14 -16	33	22
X± SD	12.60± 1.087	
Regular menstrual cycle		
Yes	95	63.33
No	55	36.66
Frequency of menstrual cycle		
≤ 21 days	10	6.66
21-28 days	55	36.66
29-35 days	13	8.66
≥35 days	17	11.33
Duration of menstrual cycle		
≤ 3 days	22	14.66
4-7 days	98	65.33
≥ 8 day	30	20
X± SD	5.33 ± 1.531	
Dysmenorrhea level		
Mild	25	16.66
Moderate	72	48
Sever	31	20.66
Not Found	22	14.66
Number of Pads		
2-4	150	100

Table (4): Distribution of Study Sample According to Student's Knowledge about Symptoms and Signs of Menstrual Disorders.

Questions		No.	%	MS
1. Pain	Mild	14	9.33	2.70
	Moderate	28	18.66	
	Sever	62	1.33	
	Not found	46	30.66	
1.1. Abdominal Pain (cramps in the lower part of the abdomen)	Mild	23	15.33	2.59
	Moderate	30	20	
	Sever	52	34.66	
	Not found	45	30	
1.2. Backache	Mild	42	28	2.46
	Moderate	29	19.33	
	Sever	40	26.66	
	Not found	39	26	
1.3. Pain in the legs	Mild	76	50.66	2.40
	Moderate	27	18	
	Sever	27	18	

	Not found	20	13.33	
1.4. Breast tenderness	Mild	87	58	2.46
	Moderate	24	16	
	Sever	28	18.66	
	Not found	11	7.33	
2. Disturbance and uncomfortable	Mild	37	24.66	2.54
	Moderate	27	18	
	Sever	47	31.33	
	Not found	39	26	
3. Fatigue	Mild	23	15.33	2.57
	Moderate	30	20	
	Sever	51	34	
	Not found	46	30.66	
4. Headaches	Mild	52	34.66	2.27
	Moderate	20	13.33	
	Sever	33	22	
	Not found	45	30	
5. Diarrhea	Mild	92	61.33	2.34
	Moderate	32	21.33	
	Sever	15	10	
	Not found	11	7.33	
6. Vertigo	Mild	70	46.66	2.58
	Moderate	40	26.66	
	Sever	29	19.33	
	Not found	11	7.33	
7. Abdominal distension	Mild	66	44	2.55
	Moderate	34	22.66	
	Sever	33	22	
	Not found	17	11.33	
8. Nausea and vomiting	Mild	77	51.33	2.28
	Moderate	22	14.66	
	Sever	24	16	
	Not found	27	18	
9. Constipation	Mild	74	49.33	2.48
	Moderate	22	14.66	
	Sever	35	23.33	
	Not found	19	12.66	
10. Menorrhagia	Mild	37	24.66	2.85
	Moderate	38	25.33	
	Sever	55	36.66	
	Not found	20	13.33	
11. Amenorrhea	Mild	68	45.33	2.62
	Moderate	37	24.66	
	Sever	34	22.66	
	Not found	11	7.33	
12. Dysmenorrhea	Mild	51	34	2.43
	Moderate	34	22.66	

	Sever	32	21.33	
	Not found	33	22	
13. Desire to sleep	Mild	19	12.66	2.60
	Moderate	21	14	
	Sever	60	40	
	Not found	50	33.33	
14. Feeling depressed	Mild	38	25.33	2.32
	Moderate	26	17.33	
	Sever	36	24	
	Not found	50	33.33	

DISCUSSION

The present study reveals that the most study sample at age group (13-21) years with mean age and SD is 15.93 ± 1.932 as shown in table (1). These findings are consistent with Ghazal (2022) who conducted a descriptive analytical study with (300) adolescent's girls age (13-19) years old in Baghdad city.

A study conducted in Egypt by El-Sayed Amr et al., (2012) conducted a cross-Sectional study with (200) female students. Their ages were ranged from 12 years to less than 21 years with mean age of the students was 16.2±1.6 years old, also more than three quarters of the sample were studying in the secondary school, this means that, all students were in an adolescence stage where the transitional from childhood to adulthood is rapid.

The Body Mass Index:

The present study reveals that the highest percentage (66.66 %) were Normal (18.50-25Kg/m²) with mean age and SD is 22.404 ± 4.585; while the lowest percentage (4.66%) were Obese (≥30 Kg/m²) as shown in table (1).

Bassi et al., (2015) conducted a study in India found the BMI, 65.8% females were normal, 20.4% females were underweight, 13.3% were in the pre-obese category and 0.1% were obese. A highly significant correlation was present between the regularity of the cycle and BMI and between menstrual flow and BMI.

which is very close to a finding where 69% females had a BMI between 18.5-24.9 kg/m2, 27% were underweight & 4% were overweight (Dars et al., 2014).

Food Habits of the Study Sample:

The present study reveals that the highest percentages (56.66%) were drinking and eating everything as shown in table (2).

But this finding is in contrast with by Amaza et al., (2012) in Nigeria conducted a cross-Sectional study was carried out among 169 Medical students revealed that the (80%) of study sample had daily fast food habits.

Overweight of the Family:

The present study reveals that the highest percentages (60.66%) were no one in the family's overweight as shown in table (2).

In Egypt conducted a study in 2012 found 40.7% of the over-weight group had history of obesity in the family (El-Sayed Amr et al., 2012).

Menstrual Cycle:

Age of Menarche

The present study reveals that the (73.3 %) of the girls had their first menstrual period between the age of 11 and 13 (mean = 12.60 years, SD of 1.087 years) as shown in table (3).

Age at menarche has largely decreased in most developed countries, the decreased age at menarche is important because of its potential impact on early matured girl's behavior (Ali et al., 2011).

A study conducted in Basrah by Almulla, (2013) conducted a cross-Sectional study with (464) girls who were included in the study their age at menarche was ranged between (9 –14) years with mean and SD (11.7 ± 0.94). A study conducted in Hyderabad, Pakistan by Dars et al., (2014) conducted a cross-Sectional study, a total of four hundred and one adolescent girls aged 12 – 18 from five schools, 67.33 % of the girls had their first menstrual period between the age of 11 and 13 (mean = 12.92 years, SD of 1.41 years).

Menstrual pattern

The present study reveals that the (63.33%) of the girls had a normal menstrual cycle. (36.66 %) had frequent periods of 4-7/21 – 28 days with mean and SD is 5.33 ± 1.531 as shown in table (3).

A study conducted in Hyderabad, Pakistan showed that the menstrual pattern (76%) of the girls had a normal menstrual cycle of 3-7/ 26 – 31 days (Dars et al., 2014).

Dysmenorrhea level

The present study reveals that the highest percentages (48%) for study sample were have moderate dysmenorrheal as shown in table (3).

A study conducted in Baghdad by Ghazal, (2022) who conducted a descriptive analytical study

found more than half of study sample had moderate level of dysmenorrhea status.

The study comprised 900 adolescent students (aged 12-18years old) from preparatory and secondary schools in rural village in Elbehira governorate, Egypt. The results revealed that 89.9% of the adolescent girls had suffered from dysmenorrhea (Yassin, 2012).

Number of Pads:

The present study reveals that the highest percentages (100%) for study sample were use 2-4 pads daily as shown in table (3).

The study in rural village in Elbehira governorate, Egypt conduct in 2012 found that Most of them (84.9%) used to change 2- 4 sanitary pads per day. Nearly one tenth (12.3%) of them used to change only one sanitary pad per day (Yassin, 2012).

Student's Knowledge about Symptoms and Signs of Menstrual Disorders

The present study reveals that the highest mean of score (2.70) in item NO. (1) Pain and (2.59) in item No. (1.1) Abdominal Pain (cramps in the lower part of the abdomen). The highest mean of score is (2.54) in item NO. (2) Disturbance and uncomfortable; (2.57) in item No. (3) Fatigue as shown in table (4).

These findings are consistent with Ghazal, (2022) who conducted a descriptive analytical study with (300) adolescent's girls. This study revealed that the highest mean of score of dysmenorrhea symptoms in cramping pain in lower abdomen. The highest mean of score of adolescent girls' knowledge regarding dysmenorrhea is reported in Cramping pain in lower abdomen, Fatigue, Dizziness, Irritability and restlessness.

Another study of menstrual pattern among adolescent girls revealed that the most prevalent menstrual symptoms was abdominal pain seen in 72.4% (142) subjects which is supported by a study where 78.4% girls had abdominal pain during menstruation followed by cramp in 30% (Patil and Angadi, 2013).

A study conducted at Faculty of Nursing, Ain Shams University by El-Sayed Amr, (2012) conducted a correlational descriptive study design with (636) female students. This study revealed that premenstrual syndrome prevailed in more than third of the sample whom complained of low abdominal discomfort, while less than quarter of them complained of painfully engorged breast and irritable as a psychological upset in comparison to (16.3%) only of them mentioned the moody feelings were associated with premenstrual period.

The present study reveals that the highest mean of score (2.85) in item No. (10) Menorrhagia and the highest mean of score (2.62) in item No. (11) Amenorrhea as shown in table (4).

A study conducted in Uyo, South Eastern Nigeria by Ekpenyong et al., (2011) conducted a cross sectional survey of 393 full time female undergraduates randomly selected from different departments in University of Uyo, South Eastern Nigeria. found that the Menorrhagia was the commonest and the most prevalent menstrual disorder (37.5%) during examination, followed by premenstrual syndrome (PMS) 33.1 % and amenorrhea 5.9%.

CONCLUSIONS

The study concluded that the most adolescent girl's student has normal BMI and have knowledge about menstrual disorders signs and symptoms.

RECOMMENDATION

The study recommended to encourage the adolescent girls to eat healthy diet and avoid fatty foods and soft drinks to avoid obesity and its complications and incorporating the health education programs about effect of obesity on health and importance of maintaining healthy weight in some of school subjects to increase the adolescence girls' awareness.

DECLARATION SECTION

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Ethical Approval Statement

The research study titled "Menstrual Disorders and Body Mass Index among Adolescent Girls at Secondary Schools in Baghdad City," conducted by Rajaa Tareq Hasan and Iqbal M. Abbas received ethical approval from the Nursing College Ethical Committee at the University of Baghdad. All participants provided informed consent, ensuring their understanding of the research's purpose. Participants were assured of anonymity and confidentiality throughout the study.

Conflict of interest

The authors declare that they have no competing interests.

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Data availability:

Data are available by contacting the corresponding author by email.

Authorship

All authors contributed equally to the study's conceptualization and design. They were involved in data collection, analysis, and drafting of the initial manuscript. All authors critically reviewed and revised the manuscript and approved the final version for submission.

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