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Research Article

PATTERN AND DETERMINANT FACTORS OF IRREGULAR MENSTRUATION IN WOMEN OF EASTERN AREA OF SAUDI ARABIA

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Abstract:

Background: Irregular menstruation is a factor that increases the rate of emotional and psychological stresses. This study was conducted to determine the patterns of menstrual cycles and the prevalence of menstrual disorders; menstrual irregularity and prolonged menstrual bleeding among adolescent and adult females.

Methods: This was a cross sectional community-based study, conducted in the Eastern area of Saudi Arabia on 639 females aged 10-52 years, during the period from 1 Abril to 31 June 2018. Data was analyzed using SPSS program, version 20.0. A 5% level was chosen as a level of significance in all statistical tests used.

Results: The mean age of study participants was calculated to be 29.3 ± 8.1 years, the mean length of the menstrual cycle was (18.73±9.9 days), and the mean Length of period is (6.22±1.63 days). Prevalence of menstrual cycle irregularities among the studied sample was (29.7%). Subjects complained of dysmenorrhea were 77.9%, of them 29.1% had irregular cycles with no statistical difference. No statistical difference between age of menarche and menstrual cycle regularity (P>0.05), higher education is associated with more cycle regularity (P<0.05). Menorrhagia was found in **33**% of our study subjects, more abnormal texture of menstrual blood found in subjects with regular cycles (P= 0.037). 54.9% were suffering continuous stress with statistically significant association between suffering from continuous stress and menstrual irregularity (P-value =0.007) with people suffering continuous stress more prone to menstrual irregularity. No statistically significant association between drinking tea or coffee repeatedly and menstrual regularity (P>0.05).

Conclusion: in this study, the prevalence of menstrual cycle irregularities was 29.7%. Higher education is associated with more cycle regularity (P<0.05). Statistically significant association between suffering from continuous stress and menstrual irregularity. No statistically significant association between drinking tea or coffee repeatedly and menstrual regularity **Key words:** Pattern, determinant factors, irregular menstruation, women, Eastern area of Saudi Arabia.

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INTRODUCTION:

Menstrual disorders are common gynecological problem for medical visits among women of reproductive age[1]. Irregular menstruation is a factor that increases the rate of emotional and psychological stresses[2]. It has also been associated with increases in the rate of coronary heart disease and type II diabetes mellitus[3]. Early diagnosis and management of these disorders will not only improve a young woman's current health, sense of well-being and overall quality of life but may also lower her risks for future disease and ill-health[4]

Data on menstrual irregularity in developing countries are limited and specific complaints such as irregular cycles, spotting, heavy bleeding and dysmenorrhea may be as common in developing countries as they are in developed countries.

Dysmenorrhea is one of the most common gynecologic disorders among adolescent girls. It is defined as pelvic pain directly related to menstruation, and is associated with symptoms ranging from headache and back pain to nausea, vomiting and diarrhea. It is classified into two categories: primary when pelvic examination and ovulatory function are normal: and secondary when there is an identifiable gynecological pathology. Primary dysmenorrhea characteristically begins when adolescents attain their ovulatory cycles; generally within the first year after menarche[5]. In the absence of appropriate pain relief medication, women with severe dysmenorrhea may not be able to carry out their normal activities. In the developing world, prolonged and excessive bleeding may enhance or exaggerate anemia and, if left untreated, may be lifethreatening [5].

Oligomenorrhea and amenorrhea may reflect an underlying endocrine disorder, such as polycystic ovaries (PCOS) or hyperprolactinemia. They may be associated with weight loss, malnutrition or obesity, and may also be symptoms of other health problems that require treatment such as endometrial tuberculosis, AIDS wasting, or cancer [4].

This study was conducted to determine the patterns of menstrual cycles and the prevalence of menstrual disorders; menstrual irregularity and prolonged menstrual bleeding among adolescent and adult females in the Eastern area of Saudi Arabia.

PARTICIPANTS AND METHODS:

This was a cross sectional community based study, conducted in the Eastern area of Saudi Arabia on 639 females aged 10-52 years, during the period from 1 Abril to 31 June 2018. The sample size was calculated using the sample size equation: $n=z^2 p(1-p)/e^2$, considering target population more than 1000, study power 95% and the prevalence of menstrual irregularities of 50%.

Data collection:

Data was collected using a pre-designed online questionnaire, which was distributed among the targeted population. It was self-administered by participants after a brief introduction or explanation of the idea of the research. The questionnaire included the relevant questions to collect data about:

- Socio-demographic characteristics, suffering from continuous stress and special habits of the participants as drinking tea or coffee repeatedly and
- Menstrual cycle related data; age at menarche, length of menstrual cycle, length of period and color and texture of the menstrual blood
- Data related to menstrual irregularities, pattern of irregularities and using drugs for menstrual pain.

Statistical analysis:

Data was analyzed using IBM SPSS Statistics for Windows version 20.0. Quantitative data was expressed as means \pm standard deviation, median and range. Qualitative data was expressed as number and percentage. The data were tested for normality using Shapiro-Wilk test. The nonparametric Mann– Whitney test was used for data which wasn't normally distributed. Chi-Square test was used for comparison between qualitative variables. A 5% level was chosen as a level of significance in all statistical tests used in the study.

Ethical considerations:

Participants were informed that participation is completely voluntary and data collectors introduced and explained the research to participants. No names were recorded on the questionnaires and all questionnaires kept safe.

RESULTS:

Table (1) illustrates the distribution of the studied patients by sociodemographic characteristics and special habits. From the table it is clear that, The mean age of study participants was calculated to be 29.3 ± 8.1 years, most of them (61%) had University degree education. More than half (54.9%) of the participants are suffering continuous stress.

Table (2) shows the distribution of the studied females by menstrual cycle related data. Mean age at menarche was (12 ± 1.6). In this study, the mean length of the menstrual cycle was (18.73 ± 9.9 days),

ranged between (5–37days). Our study showed that the mean Length of period is (6.22 ± 1.63 days), ranged between (2–10 days). Prevalence of menstrual cycle irregularities among the studied sample was (29.7%). A significant number of our subjects complained of dysmenorrhea (77.9%).

Table (3) illustrates the relation between sociodemographic characteristics and special habits and menstrual regularity. There is statistical difference between education and menstrual regularity, higher education is associated with more cycle regularity (P<0.05). No statistically significant association was shown in this study between drinking tea or coffee repeatedly and menstrual regularity (P>0.05). Our data showed a statistically significant association between Suffering from continuous stress and menstrual irregularity (P-value =0.007) with people suffering continuous stress more prone to menstrual irregularity.

Table (4) shows relation between menstrual cycle related data and menstrual regularity.

353 (70.9%) of them had regular cycles and 145 (29.1%) had irregular cycles with no statistical difference. Our study didn't show any statistical difference between age of menarche and menstrual cycle regularity (P>0.05) while length of menstrual cycle and length of period show statistical difference (P<0.05). This study showed also a statistically significant association between Texture of menstrual blood and menstrual regularity, with more abnormal texture found in subjects with regular cycles (P= 0.037). In this study, heavy clotted blood (menorrhagia) was found in 33% of our study subjects.

Table (1): Distribution of the studied patients by sociodemographic characteristics and special habits (No.=639).

Characteristics	Summary statistics
Age (in years)	
11-14	5 (0.8 %)
15 -17	12 (1.9%)
18 -21	39 (6.1%)
22 -25	94 (14.7 %)
26 - 30	126 (19.7%)
31 -39	218 (34.1%)
40-49	136 (21.3%)
≥ 50	9 (1.4%)
Mean (±SD)	29.3±8.1
Marital status	
Widow	4 (0.6 %)
Single	148 (23.1%)
Married	470 (73.6%)
Divorced	17 (2.7%)
Education	
Primary	6 (0.9%)
Secondary	210 (32.9%)
Intermediate education	33 (5.2%)
University	390 (61%)
Drinking tea or coffee repeatedly	
No	236 (36.9%)
Yes	403 (63.1%)
Suffering from continuous stress	
No	288 (45.1%)
Yes	351 (54.9%)

Menstrual cycle related data	Summary statistics
Age at menarche (in years)	
≤10	67 (10.5%)
11	114 (17.8%)
12	150 (23.5%)
13	139 (21.8%)
14	99 (15.5%)
15	40 (6.3%)
16	15 (2.3%)
≥17	15 (2.3%)
Mean (±SD)	12 ±1.6
Your birth orders	
The last	90 (14.1%)
The first	108 (16.9%)
No siblings	1 (0.2%)
Middle	440 (68.8%)
Is your menstrual cycle regular?	
No	190 (29.7%)
Yes	449 (70.3%)
Length of menstrual cycle	
Mean± S.D.	18.73 ± 9.9
Median (Range)	21 (5 – 37)
Length of period	
Mean± S.D.	6.22 ± 1.63
Median (Range)	6.22 (2 – 10)
Color of menstrual blood	
Dark red	522 (81.7%)
Light red	91 (14.2%)
Dark brown	26 (4.1%)
Texture of menstrual blood	
Heavy clotted	211 (33%)
Thin	68 (10.7%)
Mucoid	218 (34.1%)
Tissue (the appearance of tissue in the blood)	142 (22.2%)
Do you suffer from menstrual pain?	
No	141 (22.1%)
Yes	498 (77.9%)

Table (2): Distribution of the studied females by menstrual cycle related data (No.=639).

Variables	Menstrual cycle is regular		P-value
	No (N= 190)	Yes (N= 449)	
Age (in years)			
11-14	2 (40%)	3 (60%)	
15 -17	3 (25%)	9 (75%)	
18 - 21	14 (35.9%)	25 (64.1%)	
22 - 25	23 (24.5%)	71 (75.5%)	0.252
26 -30	36 (28.6%)	90 (71.4%)	0.555
31 -39	73 (33.5%)	145 (66.5%)	
40- 49	39 (28.7%)	97 (71.3%)	
≥ 50	0 (0.0%)	9 (100%)	
Marital status			
Widow	1 (25%)	3 (75%)	
Single	47 (31.8%)	101 (68.2%)	0.870
Married	138 (29.4%)	332 (70.6%)	0.879
Divorced	4 (23.5%)	13 (76.5%)	
Education			
Primary	3 (50%)	3 (50%)	
Secondary	75 (35.7%)	135 (64.3%)	0.01
Intermediate education	14 (42.4%)	19 (57.6%)	
University	98 (25.1%)	292 (74.9%)	
Drinking tea or coffee repeatedly			
No	72 (30.5%)	164 (69.5%)	0.743
Yes	118 (29.3%)	285 (70.7%)	
Suffering from continuous stress			
No	70 (24.3%)	218 (75.7%)	0.007
Yes	120 (34.2%)	231 (65.8%)	0.007

Table (3): relation between sociodemographic characteristics and special habits and menstrual regularity.

P-value is calculated by Chi-Square Test

P-value <0.05 is statistically significant

Table (4): relation) between menstrug	l cycle related data	and menstrue	al regularity.
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Chronic diseases	Menstrual cycle is regular		P-value
	No (N= 190)	Yes (N= 449)	
Age at menarche (in years)			
≤10	23 (34.3%)	44 (65.7%)	
11	26 (22.8%)	88 (77.2%)	
12	41 (27.3%)	109 (72.7%)	
13	44 (31.7%)	95 (68.3%)	0.005
14	30 (30.3%)	69 (69.7%)	0.285
15	14 (35%)	26 (65%)	
16	8 (53.3%)	7 (46.7%)	
≥17	4 (26.7%)	11 (73.3%)	

Your birth orders The last The first No siblings Middle	25 (27.8%) 32 (29.6%) 0 (0.0%) 133 (30.2%)	65 (72.2%) 76 (70.4%) 1 (100%) 307 (69.8%)	0.887
Length of menstrual cycle Mean+ S D	16 39 + 10 09	19 72 + 9 66	<i>~</i> 0 001∗
Median (Range)	14(5-35)	22(5-37)	10.001
Length of period Mean± S.D. Median (Range)	6.48 ± 1.66 7 (2 - 10)	6.11 ± 1.6 6 (2 - 10)	0.012*
Do you have menstrual pain No Yes	45 (31.9%) 145 (29.1%)	96 (68.1%) 353 (70.9%)	0.521
Color of menstrual blood Dark red Light red Dark brown	148 (28.4%) 30 (33%) 12 (46.2%)	374 (71.6%) 61 (67%) 14 (53.8%)	0.117
Texture of menstrual blood Heavy clotted Thin Mucoid Tissue (the appearance of tissue in the blood)	77 (36.5%) 16 (23.5%) 54 (24.8%) 43 (30.3%)	134 (63.5%) 52 (76.5%) 164 (75.2%) 99 (69.7%)	0.037

P-value is calculated by Chi-Square Test

* P-value is calculated by Mann–Whitney test

DISCUSSION:

The age of menarche is determined by general health, genetic factors, socioeconomic and nutritional status. It is typically between 12 and 13 years; but with the improvements in the nutritional status and general health it has declined in many populations during the last decades[6]. In this study, the mean age at menarche was (12 ± 1.6) similar to the other studies that have been done in recent years [7]. In Western European countries, the average age at menarche appears to have dropped over the past 150 years from over 16 to under 14 years. In the UK, girls enter puberty around the age of 10 years with a median age at menarche of 12.9 years [8]. In Italy, the mean age at menarche was estimated at 12.4 ± 1.3 years[9, 10]. In this study, the mean length of the menstrual cycle was (18.73 ± 9.9 days), ranged between (5-37 days). Gumanga and Kwame-Arvee, reported that the menstrual cycle length for 86.1% of the girls ranged from 21 to 35 days and the mean length of the menstrual cycle was 27.9 ± 0.9 days with the median and mode being 28 days [11]. Similar results were reported by Zegeye et al [12].

Our study showed that the mean Length of period is $(6.22 \pm 1.63 \text{ days})$, ranged between (2-10 days). In another study where 368 menstrual periods were analyzed, **Dewhurst et al.** reported that menses lasted

between 3 and 7 days in 88% of the cycles, with an average duration of 5 days[13].

In our study the results showed a high percentage of our population suffered from different kinds of menstrual disorders; Prevalence of menstrual cycle irregularities among the studied sample was (29.7%). With the exception of *Karout et al.*,[14] who reported the prevalence of irregular menstruation in 59.4% of their participants, the average incidence of irregular menses was noted to be 5-24% beyond the first 6-12 months after menarche[11, 15].

A significant number of our subjects complained of dysmenorrhea (77.9%), 353 (70.9%) of them had regular cycles and 145(29.1%) had irregular cycles with no statistical difference. The prevalence of dysmenorrhea varies widely between different populations and between different age groups within the same population. Such variation may be due to different etiologies, cultural differences in pain perception and variability in pain threshold[14]. Prevalence rates between 51% and 78% have been reported [11, 12, 16-19]

Our study didn't show any statistical difference between age of menarche and menstrual cycle regularity (P>0.05) while length of menstrual cycle and length of period show statistical difference (P<0.05). There is statistical difference between education and menstrual regularity, higher education is associated with more cycle regularity (P<0.05). This study showed also a statistically significant association between Texture of menstrual blood and menstrual regularity, with more abnormal texture found in subjects with regular cycles (P= 0.037). During a normal menstrual cycle the amount of blood loss ranges between 30 and <80 ml with the first 2 days being the heaviest [14].

In this study, heavy clotted blood (menorrhagia) was found in **33**% of our study subjects, which is identical with a study done in India and showed that the prevalence of menorrhagia was 33% among the studied women between the ages of 25-34 years[**20**]. Another study done by *Coulter et al.* reported that the prevalence of heavy bleeding was 15% in the age group of 30-40 years[**21**].

In our study, 54.9% of the participants are suffering continuous stress. our data showed a statistically significant association between suffering from continuous stress and menstrual irregularity (P-value =0.007) with people suffering continuous stress more prone to menstrual irregularity. Experimental data In animals and humans suggests that chronic or severe stress leads to anovulation and amenorrhea in women[22].

No statistically significant association was shown in this study between Drinking tea or coffee repeatedly and menstrual regularity (P>0.05). *Cooper et al* [23] did not observe any notable relation between caffeine intake and cycle length, variability, and menses length.

STUDY HAS SOME LIMITATIONS:

Information of the menstrual history was assessed by questionnaires rather than menstrual diaries. Other studies have suggested that retrospective self-reports of menstrual history are prone to have errors [24].

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