

Body Mass Index, Sleep Quality, Stress and Menstrual Cycle among Female University Students of Pakistan

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Abstract

Introduction:

Menstrual irregularity is a major health concern that damages a woman's reproductive health and quality of life. The purpose of this research was to examine the association between Body Mass Index (BMI), sleep quality, perceived stress, and menstrual cycle among young women of Pakistan.

Methods

In this cross-sectional study, 286 participants were purposively sampled from multiple universities in Pakistan. Pittsburgh Sleep Quality Index (PSQI) and Perceived Stress Scale (PSS) were used to measure sleep quality and stress among participants. BMI was calculated using the height and weight of the participants. Other demographic characteristics such as age, monthly household income, participant and parents' education, birth order, marital status, age at menarche, family history of menstrual problems, length of menstrual cycle, and length of menstruation were also explored. To avoid the cultural inhibition and sensitivity associated with women's reproductive health, ethical protocols were ensured, and data were gathered from the women without any formal diagnosis of menstrual disorders.

Results

While the majority of women participants had regular menstrual cycles, a substantial number exhibited irregular patterns. BMI, stress, and maternal education significantly predicted the length of the menstrual cycle, whereas sleep quality significantly predicted the length of menstruation. Age at menarche and monthly household income were significantly associated with both menstrual variables.

Conclusion

Therefore, these findings implore public health initiatives to create awareness among women about the detrimental effects of menstrual irregularity and associated risk factors. Further, highlighting the protective factors, such as a healthier lifestyle, for improving menstrual health.

Introduction

During adolescence, females undergo a series of physical and hormonal changes in their bodies, which is known as the menstrual cycle. The important phase of this cycle is menstruation, during which periodic bleeding occurs from the vagina over a week. When adolescents reach puberty, they experience their first menstruation, known as menarche. Menarche begins between the ages of 11 and 14 years. The average age of menarche is 12 to 13 years with menstrual duration of 2 to 8 days, 60–80 ml of blood released [1], and the normal menstrual cycle of 21 to 35 days [36]. Any menstrual cycle lower than 21 days and greater than 35 days is considered abnormal [5, 36, 37]. The menstrual cycle continues till the time of menopause. Menopause marks the end of reproductive age for a woman [11]. This typically occurs in women between the ages of 45 and 55 years, where the menstrual cycle eventually subsides [11, 44]. The menstrual cycle is regulated by a complex functioning of the hypothalamic, pituitary ovarian (HPO) axis and endogenous hormones. However, any imbalance and irregularity in the release of these hormones affects the menstruation resulting in menstrual problems [37] such as irregular periods, abnormal length of menstruation, abnormal blood volume, period cramps, and premenstrual syndrome [14], anemia, psychological problems, infertility, impaired quality of life, and many other medical diseases [5]. There are multiple underlying factors in disturbance of menstrual cycle such as genetics, lifestyle, psychosocial, and nutritional factors such as the age of menarche, hormonal imbalance, and chronic diseases such as diabetes, thyroid-related problems, premenstrual and menstrual disorders such as polycystic ovary syndrome, dysmenorrhea, mental health problems, stress, obesity, alcohol smoking and exercise [14].

Many researchers have linked sleep disturbance with menstrual irregularities that has been further summarized by systematic reviews [18, 32]. According to these systematic reviews, premenstrual syndrome and dysmenorrhea are most common among women with sleep disturbances, further reducing their efficiency, attentiveness, and overall satisfaction with life. For instance, one study linked both poor sleep quality and insomnia with longer menstrual flow, heavy blood volume, and severe pain during the period, and premenstrual syndrome among female university students. However, sleep duration was not statistically linked with but contributed to premenstrual symptoms. Female university students who had sleep disturbances and insomnia symptoms had a higher prevalence of irregular menstruation as compared to those who did not have sleep disturbances [45]. Another recent study linked academic stress levels with higher abnormal menstrual cycles among adolescents [1]. Studies from Pakistan [27] linked unhealthy food and junk food intake with higher BMI index and further linked this

with menstrual abnormalities among female adolescents, emphasizing the investigation of this domain in countries where the aspect of menstruation is still stigmatized and under-researched.

In Pakistan, where the majority of young women experience menstrual irregularity yet unable to seek medical facilitation due to the sensitive nature of the issue [17], its exploration becomes more relevant, thus highlighting the similar challenges with South Asian and similar cultures. In Pakistan, most research regarding menstrual irregularity has been conducted either on clinical or adolescent populations [22, 31, 42]. Since menstruation is an under-discussed issue due to its high cultural sensitivity, we tend to investigate the existence of menstrual issues in the context of body mass index, sleep quality, perceived stress, and menstrual cycle among young adult women from the general population who have never been diagnosed with any menstrual issue. Furthermore, various demographic factors such as age, monthly household income, educational level of participants and their parents, marital status, birth order, age of menarche, and menstrual cycle were also explored. The underlying reason for including a few social factors, particularly household income, is based on the empirical evidence [38] that better financial support provides better living and healthcare facilitation conditions. Based on the aforementioned literature, this study hypothesized the following hypotheses in the context of young adult women:

H1. Women with high or low body mass index will report irregular menstrual cycles as compared to women with a normal body mass index.

H2. Poor sleep quality will be positively associated with irregular menstrual cycles among women.

H3. High level of perceived stress levels will be positively associated with irregular menstrual cycles among women.

H4. Women with early or delayed menarche will report irregular menstrual cycles as compared to women who had menarche at the normative age.

Methodology

The current study employed a correlational and cross-sectional research design for quantitative inquiry of the study variables.

Participant's Selection and Procedure

Following a convenient sampling approach, 286 women aged 18 to 30 years were approached from multiple universities in Pakistan. Any females who suffered from any menstrual disorder, any medical condition that affected their menstrual cycle, or who used any medication/injection to induce their menstruation were not included in the study. The underlying reason was to investigate the existence of menstrual issues among the general population, as the cultural sensitivity intrigued its investigation. After taking approval from the Institutional Ethical Review Board, participants were approached through their educational institutes, where they were first briefed in a session about the aim of the study and the importance of their participation. Participants were informed about anonymity, confidentiality, and the right to withdraw. It took 15 to 30 minutes on average to provide the given information and answer their queries. Many young women follow the cultural and social standards of thinness, beauty, and sexual appeal, thus negating the required health standards for a healthy life that were evident from their questions and discussion. Few women were hesitant to be part of this study, and their decision was respected. On further inquiry, the underlying reason was stigma and backlash associated with reproductive health that made them uneasy to be part of this study. In order to reduce recall bias, participants were also asked whether they had a period tracking application installed on their phones or if they had marked calendars inside their phones that they could use to provide information regarding their menstrual characteristics.

Demographic Characteristics of Sample

The age distribution of the sample indicated that the largest proportion of participants were 21-year-old women (19.6%), followed by those aged 22 (15.7%), 23 (14.0%), and 25 years (13.6%). Lower proportions were observed for other age groups, including 24 years (9.8%), 19 years (8.0%), 20 years (6.6%), 26 years (5.2%), and 27 years (2.4%). The least represented age groups were 28 to 30 years, each comprising approximately 1% of the sample. With respect to monthly household income, 43.7% of participants reported an income of PKR 150,000 or above, 40.2% reported an income between PKR 55,000 and 150,000, and 16.1% reported an income below PKR 55,000.

In context of participants' education, 55.6% of the participants were undergraduate, 32.1% were currently enrolled in postgraduate programs, and 7.7% who had completed postgraduate studies. Regarding maternal education, 28.7% had completed undergraduate, 26.6% had completed matriculation, and 18.2% had completed intermediate, 17.1% were postgraduates while 9.4% were uneducated. On the other hand, the proportion of father's education was reported as 32.5% completed undergraduate, 30.8% were postgraduates, 20.3% had finished their matric, whereas 14.3% had intermediate certificate and 2.1% were uneducated. In context of marital status, 93% of the sample was single and 7% were married. In context of birth order, 39.2% of the female participants were middle child, 29.4% were eldest, 27.6% were the youngest child and 3.8% were the only child.

Menstrual Characteristics of Sample

Among 286 women, 226 (79%) reported a normative age of menarche, 12(4.2%) reported early menarche, whereas 48(16.8%) reported late menarche. In addition, 229 women (80.1%) reported no family history of menstrual problems, and 57 women (19.9%) had a history of menstrual problems. In the context of menstrual cycle length, 59.3% (169 women) had normal cycles, followed by 24.5% (70 women) had short cycles, and 16.4% (47 women) had long cycles. For the length of menstruation, 209 (73.1%) had a regular length of menstruation. 30(10.5) % had a very regular length of menstruation while 47(16.4%) had an irregular length of menstruation.

Measurements

Participants were provided with informed consent, a demographic sheet asking about participants' different demographic and menstrual characteristics.

The sleep quality of the participants was measured by the Pittsburgh Sleep Quality Index [8]. It has a total of 10 items consisting of the following sub-scales: sleep duration, sleep disturbance, sleep latency, day dysfunction due to sleepiness, sleep efficiency, overall sleep quality, and requiring medications to sleep. Items number 1 to 4 on the scale require one-word answers, whereas items number 5 to 10 require choosing the most suitable option on the Likert scale that ranges from 0 to 3, with 0 being better and 3 being the worst. Items number from 1 to 9 were scored. Item number 10 has no scoring and is only added for informational purposes. The total score ranged from 0 to 21 after adding scores of all the subscales. A total score of 5 or less than 5 indicated good sleep quality whereas scores greater than 5 indicated poor sleep quality.

To make the PSQI culturally appropriate, changes were made in item no. 10. The original statement "do you have a bed partner or roommate" was changed into "do you have a roommate or share a room with siblings". The preceding statement "if you have a bed partner or roommate, ask him/her how often in the past month you've had..." was changed into "if you have a roommate or share a room with siblings, ask him/her how often in the past month you've had...". The changes were made after taking expert opinion and approval of the original author.

The stress levels of the female participants were determined using the Perceived Stress Scale [10]. It is 10-item self-report measure recording symptoms experienced during the past month. The items were answered on a 5-point Likert scale ranging from never scored as 0 to very often scored as 4. Item numbers 4, 5, 7 and 8 were reverse-coded before calculating the total score. Overall, the score ranged from 0 to 40, which further categorized the stress level as low when the score is below 13, moderate for scores 14 to 26, and high for scores 27 to 40. BMI was measured through the height and weight reported by participants. Khaskheli et al. (2023) categories were followed for BMI, which are healthy or normal (18.5–24.9), underweight (below 18.5), and overweight (higher than 25).

Menstrual characteristics were categorized based on the menstrual cycle length, which ranges from 21 to 35 days [36] and length of menstruation within 3 days, 5 to 7 days, or more than 8 days, respectively representing short, typical, and prolonged durations. Length of menstrual cycle between 21 to 35 days was considered regular, whereas menstrual cycle less than 21 days or more than 35 days was considered irregular. Length of menstruation of within 3 days, and 5 to 7 days were considered as normal and regular, whereas 8 or more days were considered as irregular [36]. Questions regarding menstrual characteristics were placed in the demographic sheet.

Ethical Considerations and Approval:

Institutional Ethical Review Board approval was obtained before approaching the young women in their respective universities. After acquiring institutional approval, participants were first briefed in a session about the aim of the study and the importance of their participation. Besides they were assured about confidentiality and anonymity of their responses, the right to withdraw from the research at any point, inclusion and exclusion criteria of the study, and were also provided with both verbal and written informed consent along with the study questionnaires. Due to limited resources and lack of funding so researcher and supervisor voluntarily provided 30-minute debriefing and awareness sessions that helped female university students in dealing with menstrual issues and when they should be seeking help from a medical professional. They were further encouraged to seek professional help and connected with relevant health professionals.

Results

Data was analyzed using Statistical Package for the Social Sciences (SPSS) version 26. Cronbach's alpha values were calculated in order to obtain internal consistency of the scales. Furthermore, chi-square analysis was conducted in order to test the association between the categorical variables.

Discussion

The following study revealed a significant association between sleep quality, stress, BMI, age at menarche, and menstrual cycle. Reliability analysis was conducted for both the Perceived Stress Scale and the Pittsburgh Sleep Quality Index. Results from Table 1 indicated that both scales' alpha values are in an acceptable range, that are above 0.70 [13].

Demographic Characteristics and Menstrual Cycle

Due to the smaller sample size of groups, few demographics were explored for association with study variables. Results in Table 2 indicated a non-significant association between the age of participants and both menstrual characteristics (length of menstrual cycle, length of menstruation). Monthly household income had a significant association with both the length of menstrual cycle and the length of the menstruation. Maternal education had a significant association with the length of menstrual cycle, whereas non-significant association with the length of menstruation. On the other hand, family history of menstrual problems did not show any significant association with either the menstrual cycle or the length of menstruation.

Chi-square analysis was carried out between age groups and menstrual characteristics. The age of participants did not have a significant association with the length of the menstrual cycle and the length of menstruation. Contrary findings were reported in a previous study [33] where the sample included a diverse age range from 14 to 57 years. In contrast, the current study sample was young women aged 18 to 30 years who are in prime of their age. Previous study [30] indicated that women's fertility is higher in the aforementioned age bracket, indicating the less associated hormonal concerns. Furthermore, researchers [20, 35] have supported the similar results as achieved in current study.

Age of the participants did not have a statistically significant association with menstrual regularity, suggesting the presence of multiple factors that could contribute to better lifestyle and gynecological health. Moreover, the study participants were mainly young adults, which also limits the presence of menstrual issues [30]. Besides, monthly household income showed a significant association with the length of menstruation, whereas maternal education did not have a significant association with the length of menstruation, as indicated in previous research [26, 29]. The main aim for the exploration of various demographic factors stems from existing literature where mothers' education greatly influences the menstrual health of their daughters in terms of knowledge and practices [6, 15, 30].

Sleep Quality and Menstrual Cycle

In the context of sleep quality and irregular menstrual cycle, the results of our study are similar to previous studies [24, 28, 45], indicating that sleep quality and duration matter as women need sound sleep to pass through this painful process and vice versa. If the sleep time, duration, and bedtime are not appropriate, it affects the circadian rhythm, resulting in hormonal imbalances that become apparent in menstrual irregularity [9, 24].

Stress and Menstrual Cycle

Regarding the association between stress and the menstrual cycle, Table 3 results indicate that women with higher stress levels have irregular menstrual cycles, consequently suggesting stress's effect on hormonal balance. This empirical evidence supports the existing literature [19, 46]

Our results coincide with one study [31], who also revealed a statistically significant association between stress and menstrual irregularities among students and staff nurses. Another study [4] also found stress to be a significant predictor of menstrual cycle regularity. Those adolescents who experienced a high level of stress had 3.1 times more chance of experiencing irregular menstrual cycles. High levels of stress produce high levels of cortisol, which overstimulates the hypothalamus, adrenal, and pituitary (HPA) axis. Since the HPA axis controls the release of reproductive hormones, its overstimulation can disrupt the hormone release and increase the chances of an irregular ovulation, thus leading to an irregular menstrual cycle [31].

Body Mass Index and Menstrual Characteristics

Results from Table 3 suggested that BMI was significantly associated with the length of the menstrual cycle, whereas a non-significant association was apparent with the length of menstruation. Previous studies indicated the same in the context of BMI and length of menstrual cycle [26, 39, 40]. Studies from Pakistan also inferred the same [7, 23], further supporting that a high body mass index delays menarche and causes menstrual irregularity.

Age at menarche had a significant association with both the length of the menstrual cycle and the length of menstruation (see Table 3). Our results align with previous studies [7, 12, 26, 29, 35]. These researchers have reported that earlier age of menarche leads to shorter menstrual cycle and longer bleeding duration, whereas later menarche age leads to longer menstrual cycle and more regular bleeding. Current study findings empirically supported this. Similar results were revealed in one study [16], who found a significant association between age at menarche and the odds of menstrual regularity. Early menarche individuals had higher odds of experiencing shorter cycle length while late menarche individuals had higher odds of experiencing longer cycle lengths.

Limitations and Future Recommendations

Despite substantial contributions in terms of empirical evidence from a sensitive culture where disclosing reproductive health-related issues is challenging and somewhat considered taboo [25, 41]. The participants reported menstrual symptoms by solely relying on their memory. Due to limited space, the researcher wasn't able to place measuring instruments that could provide an accurate measure of their weight, height, and physiological responses. Thus, relying solely on participants reporting their physiological measures. This might raise concerns about recall bias and social desirability. Future studies, along with measuring the aforementioned aspects, can use a period app on a smartphone to exactly track menstrual cycle lengths and menstruation lengths of participants. Thus, providing the most accurate body measures and objective estimates could reduce the response biases, resulting in the most authentic empirical claims.

This study sample only included university students, limiting the aspect that the educated sample's perspective might differ from that of the less educated ones. Moreover, future researchers can focus more on women diagnosed with menstrual irregularities, bringing forth the comparative nature of the issue. Moreover, the sample comprised of a normal population without any diagnosed menstrual problem, thus limiting the generalizability of findings. Further emphasizing the need to collect data from large samples across Pakistan, including both rural and urban areas. This will ensure the generalizability and significance of results.

Since menstrual irregularity is a sensitive issue related to women's reproductive health, collecting data from universities and the general population was a challenge in itself. Thus, the current study findings provide substantial empirical evidence for future researchers and also created the awareness among women about the importance of their gynecological health.

Implications

The following study has given an insight into women's reproductive health and how certain lifestyle factors, including poor sleeping habits, eating habits, diet intake, and stress, can cause reproductive health issues. These factors are modifiable and can be altered by adopting healthy eating habits, a balanced diet, exercise, learning stress management, emotion regulation techniques, and time management to improve sleep and establish a good sleeping routine. If implemented, these measures can help improve female reproductive health as well as create more awareness of the importance of reproductive health among the general population. These lifestyle changes will not only affect reproductive health, but they can also improve overall physical and mental health, reduce the risk of many health conditions, and enhance their quality of life.

The study can provide crucial information on women's reproductive health that can be used by health policymakers for the betterment of women. Since our study emphasizes modifiable characteristics, health policymakers can introduce intervention programs to cater to these characteristics. The intervention programs can incorporate stress management and time management programs to improve sleep quality, psycho-educate mothers regarding female reproductive health, physical exercise programs, healthy eating, and provide awareness on sleep hygiene and adopting a healthy lifestyle. Moreover, along with health care professionals, mothers can play a vital role in educating their daughters for better preparation and understanding of their menstrual symptoms.

The following study also raised awareness about the prevalence of menstrual irregularities, risk factors, their types, and characteristics. Learning about the differences between irregular and regular menstrual cycles and menstrual abnormalities will help females keep a check on their menstrual problems and identify any symptoms that indicate menstrual abnormalities so they can seek the help of a health professional. The present study will also break the taboo regarding the topic of menstruation and pave the way for further research on reproductive health issues of women in Pakistan.

Conclusion

Menstrual irregularity is a major health concern that negatively impacts a woman's reproductive health and quality of life. With the results being discussed, it is necessary to create awareness among the female population about menstrual irregularity, its adverse effects, risk factors, and how changing their lifestyle and habits such as practicing sleep hygiene, stress management, and a healthy diet, can bring a substantial change in their reproductive health and eventually improve their quality of life.

Declarations

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Competing Interests

All authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript. The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Ethical Approval

The study was approved by the Institutional Ethical Review Board (IERB) of Shaheed Zulfikar Ali Bhutto Institute of Science and Technology (SZABIST University), Pakistan, on Dec 21st, 2023 (Ref no. IERB (17)/SZABIST-ISB(SS)/22111161/230221). All the participant data in this research study were handled according to the ethical codes established by the American Psychological Association (APA) and guidelines provided in the Declaration of Helsinki. Permission for data collection was taken from the respective institutions. Both verbal and written informed consent were obtained from the participants.

Clinical Trial Number: Not Applicable

Data Access and Responsibility

The first author Nimrah Naseem had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Data Availability

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Author Contributions

NN was responsible for the methodology, data curation, and interpretation, and writing the original draft. NN also took on project administration and handled the writing review and editing. AH was involved in the conceptualization and formal analysis, as well as project administration. AH also contributed to the writing, reviewing, editing and provided supervision.

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Tables

Table 1 *Descriptive Statistics for Perceived Stress Scale and Pittsburgh Sleep Quality Index (N = 286)*

Scale	No. of items	α	M (SD)	Range		Skewness	Kurtosis
				Potential	Actual		
PSS	10	.72	20.26(5.34)	0-40	5-33	-.07	-0.38
PSQI	10	.77	7.5(.4.14)	0-21	1-19	.94	0.58

Note. PSQI= Pittsburgh Sleep Quality Index, PSS= Perceived Stress Scale

Table 2 *Chi-square for demographic characteristics, LOMC and LOM (N=286)*

		LOMC					LOM				
Variables	Categories	Short cycle	Normal cycle	Long cycle	χ^2 , (2)	ϕc	Very regular	Regular	Irregular	χ^2 , (2)	ϕc
		<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)			<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)		
Monthly household Income	Less than 55k	10(21.7)	24(52.2)	12(26.1)			4(8.7)	28(60.9)	14(30.4)		
	55k-1.5lacs	40(34.8)	59(51.3)	16(13.9)	15.9*	0.17	8(7)	87(75.7)	20(17.4)	13.1*	0.15
	More than 1.5 lacs	20(16)	86(68.8)	19(15.2)			18(14.5)	94(75.2)	13(10.4)		
Maternal Education	Matric/O levels	20(26.3)	46(60.5)	10(13.2)			12(15.8)	50(65.8)	14(18.4)		
		18(34.6)	26(50)	8(15.4)			2(3.9)	40(76.9)	10(19.2)		
	FSC/A levels	21(25.6)	43(52.4)	18(22)	18.4*	0.18	8(9.8)	62(75.6)	12(14.6)	13.6	0.15
	Undergraduate	7(14.3)	39(80)	3(6.1)			8(16.3)	37(75.5)	4(8.1)		
	Postgraduate	4(14.8)	15(55.5)	8(29.6)			0(0)	20(74.1)	7(25.9)		
Age of participants	18-24 years	56(26)	124(57.7)	35(16.3)			26(12.1)	150(69.8)	39(18.1)		
	25-30 years	14(18.7)	45(63.4)	12(16.9)	1.2	0.06	4(5.6)	59(83.1)	8(11.3)	5.0	0.13
Note: * <i>p</i> <.05, ** <i>p</i> <.01, LOMC= Length of Menstrual Cycle, LOM=Length of Menstruation											

Table 3 Chi-square for PSS, PSQI, BMI, AAM, LOM and LOMC (N=286)

LOMC							LOM				
Variables	Categories	Short cycle <i>n</i> (%)	Normal cycle <i>n</i> (%)	Long cycle <i>n</i> (%)	χ^2 , (2)	φc	Very regular <i>n</i> (%)	Regular <i>n</i> (%)	Irregular <i>n</i> (%)	χ^2 , (2)	φc
Body Mass	Low	17(29.3)	39(67.2)	2(3.5)			2(3.4)	46(79.3)	10(17.2)		
Index	Normal	41(23.6)	106(60.9)	27(15.5)	19.5***	0.19	18(10.3)	129(74.1)	27(15.5)	7.8	0.12
	High	12(22.6)	23(43.4)	18(34)			10(18.9)	33(62.3)	10(18.9)		
	Low	2(7.7)	20(76.9)	4(15.4)			2(7.7)	22(84.6)	2(7.7)		
Stress	Moderate	51(23.2)	126(57.3)	43(19.5)	17.9***	0.18	24(10.9)	162(73.6)	34(15.5)	5.7	0.10
	High	17(42.5)	23(57.5)	0(0)			4(10)	25(62.5)	11(27.5)		
Sleep quality	Good	18(18.4)	72(73.5)	18(18.4)	3.1	0.11	6(6.1)	84(85.7)	8(8.2)	12.4**	0.21
	Poor	52(27.8)	106(56.7)	29(15.5)			24(12.8)	124(66.3)	39(20.9)		
Age at Menarche	Early	0(0)	8(66.7)	4(33.3)			0(0)	12(100)	0(6)		
	Normal	60(26.5)	135(59.7)	31(13.7)	9.2*	0.13	24(10.6)	169(74.8)	33(14.6)	11.3*	0.14
	Late	10(20.8)	26(54.2)	12(25)			6(12.5)	28(58.3)	14(29.2)		
FHMP	Yes	18(31.6)	29(50.9)	10(17.5)			2(3.5)	42(73.7)	13(22.8)		
	No	52(22.7)	140(61.1)	37(16.2)	2.3	0.09	28(12.2)	167(22.9)	34(14.8)	5.0	0.13
Note: * <i>p</i> <.05, ** <i>p</i> <.01, *** <i>p</i> <.001 LOMC= Length of Menstrual Cycle, LOM= Length of Menstruation, FHMP= Family History of Menstrual Problem											