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Original Article

Menstrual Disorders and Relationship with Psychological Stress among Medical Students

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Abstract

Background: Menstruation is an inevitable part of a female's life and an important indicator of normal sexual and reproductive health. The changes in the normal menstrual pattern of female in the reproductive age may affect physical, physiological and psychological wellbeing. Stress may affect the pattern of menstrual cycle by stimulating the hypothalamo-pituitary-adrenal axis which is responsible for the production of cortisol hormone.

Objectives: The aim of the study was to evaluate menstrual disorders and their relationship with psychological stress among the students of Rajshahi Medical College, Rajshahi.

Materials and Methods: This cross-sectional type of descriptive study was carried out from January 2023 to December 2023 in the Department of Physiology, Rajshahi Medical College, Rajshahi. The study was conducted on 247 female students who were studying in Rajshahi Medical College after obtaining ethical clearance from the Ethical Review Committee of Rajshahi Medical College and informed written consent from the students. Data were collected by semi-structured questionnaire and analyzed by SPSS software, version-24. A p value < 0.05 was considered statistically significant for all tests.

Results: The students were 21.89 ± 1.44 years old on average, 12.01 ± 1.37 years old when they menarched, BMI 22.07 ± 3.34 kg/m2, they had a monthly family income of 41874.49 ± 20436.26 taka, their menstrual cycle lasted 30.66 ± 6.43 days, and their flow lasted 5.26 ± 1.59 days. Marital status of the students showed that majority (89.50%) of the students were unmarried, (75.70%) of the students were from urban area and majority (85.40%) of the students lived in hostel.Of the students, 20.24% experienced oligomenorrhea, 6.88% hypomenorrhea, 7.29% menorrhagia, and 5.26% polymenorrhea in relation to menstrual disorders. The majority of students (77.30%) experienced moderate stress, followed by high stress (19.00%) and low stress (3.60%). Medical students' psychological stress levels were statistically significantly correlated with both menorrhagia and oligomenorrhea ($p < 0.01$ and $p < 0.001$, respectively). However, neither polymenorrhea nor hypomenorrhea was substantially associated with the medical students' psychological stress levels ($p > 0.05$ in both cases).

Conclusion: Psychological stress was significantly associated with the prevalence of various types of menstrual disorders. Timely diagnosis and management of menstrual abnormalities with proper counselling are necessary for improvement of health, sense of well-being, overall quality of life of students and lower the risks for future diseases.

Keywords: Medical students, Menstrual disorders, Premenstrual syndrome, Perceived stress scale and psychological stress.

Introduction

The normal reproductive years of females are characterized by monthly rhythmic changes in the rate of secretion of female hormones and corresponding physical changes in the ovaries and other sexual organs which is called menstrual cycle. A woman's menstrual cycle usually follows an average 28 day cycle.[1] A normal menstrual cycle leads to formation of a dominant follicle with a mature ovum in the ovary then ovulation. In absence of fertilization, the endometrial lining sheds out resulting in discharge of blood from the uterus through the vagina which is called menstruation - a natural physiological phenomenon

occurring at a more or less regular monthly interval during women's reproductive life.[2]ovulatory, and luteal

Menstruation first occurs in adolescents between 11 and 14 years of age with a period length of average 7 days with a cycle length ranging from 21 to 45 days with an average blood loss of 20 to 80 ml.[3] This phenomenon is not an easy one and is often associated with some degree of suffering. According to several studies, a large proportion of the female population of reproductive age suffer from menstruation related health issues. There are various forms of menstrual disorders. The list of menstrual disorders ranges from dysmenorrhea, premenstrual syndrome (PMS), polymenorrhea, oligomenorrhea, menorrhagia, amenorrhea to irregular menstrual cycle. Dysmenorrhea is the commonest gynecological disorder among women with prevalence of 60% to 93%.[4]

Other abnormalities are also common. Although menstrual disorders are common health problems, they are generally perceived as only minor health concerns and thus irrelevant to the public health agenda particularly for females in developing countries.[5] But menstrual abnormalities not only cause deterioration in quality of life but also have detrimental effects on mental and reproductive health and also carry economic burden. Menstrual disorders over prolonged periods of time can cause anovulation, endometrial hyperplasia, infertility,[4] osteoporosis, breast cancer.[6] Menstrual patterns can be affected by various factors including age, ethnicity, family history, physical activity, dietary habits. Stress can be a major contributor to or cause of menstrual irregularities.[7]

Several studies have shown association of stress with variation in the length of menstrual cycle, anovulation, duration and amount of menstrual bleeding. Multiple pathways have been proposed linking perceived stress with reproductive function. The hypothalamic pituitary adrenal axis is activated during stress that suppresses hypothalamic gonadotropin releasing hormone (GnRH) secretion. GnRH stimulates the production of follicle stimulating hormone (FSH) and luteinizing hormone (LH) which activate the ovary to secrete estradiol and progesterone. Suppression of GnRH secretion suppresses reproductive hormone secretion and also leads to a delay or inhibition of the LH surge. Thus stress can alter hormonal profiles and in turn menstrual outcomes.[6,8]

Stress is prevalent among medical professionals and that is also true for the medical students who have very busy and demanding schedules. Psychological stress is common among medical students for various reasons. High expectations of parents, exhausting work hours, continuous evaluation process, striving for earning high grades, enormous syllabus to be covered in a limited time period, thought of appearing or failing in exams, performance in periodic examinations are potential sources of stress among medical students.[9] Due to the high prevalence of psychological stress among them, medical students are at high risk of developing menstrual abnormalities. Several studies have been done in different countries regarding the proportion of menstrual disorders and their association with psychological stress among the medical students but to the best of our knowledge very few studies has been done in our country. Therefore, the study was designed to assess the proportion of medical students suffering from menstrual disorders and their relationship with psychological stress in our context.

Materials and Methods

This study was a cross-sectional descriptive study. It was conducted in the Department of Physiology, Rajshahi Medical College, Rajshahi during the period of January 2023 to December 2023. Female students of Rajshahi Medical College were enrolled in this study. Before the starting of the study, a questionnaire was prepared according to the objectives of the study. All questions regarding the participants demographics as well as their menstrual pattern (menarche age, flow duration in days and its quantity, cycle length in days) and history of oligomenorrhea, polymenorrhea, hypomenorrhea and menorrhagia were included in the questionnaire. For assessment of stress level, Perceived Stress Scale was used. Then on the basis of inclusion and exclusion criteria history was taken from the students. Individuals who were match according to the selection criteria of the study were informed about

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the purpose of the study. After being informed about the purpose of the study individuals who gave consent to participate in the study were finally selected as a study subject. Then data were collected based on variables of interest.

Sampling:

Stratified random sampling technique was applied to select each individual in this study.As we knew that in Rajshahi Medical College, total 4 phases medical students are available. In this study, students were divided into 4 strata-131 female students in phase 1, 122 students in phase 2, 109 students in phase 3 and 134 students in phase 4. So, total population was 496. As sample size was 247, sampling fraction= [(247÷480) X 100] = 49.80%. So, 65 students from phase 1, 61 students from phase 2, 54 students from phase 3 and 67 students from phase 4 were selected.

Inclusion Criteria:

Female students of Rajshahi Medical College, Rajshahi had been studying medical science for at least 1 year.

Exclusion Criteria:

Medical students with known chronic health problems such as thyroid disorders, students with any history of psychiatric problems, diagnosed pelvic pathology such as fibroids, endometrioses, polycystic ovarian syndrome, adenomyosis, any pregnant and lactating mother among the medical students, hormonal contraceptives users were excluded from the study.

Data Collection Tools:

The data were taken with the help of using a semi-structured questionnaire (research instrument) containing all the variables of interest. For assessment of psychological stress level Perceived Stress Scale was used.

Statistical Analysis:

All data were analyzed by using the 'Statistical Package for Social Sciences (SPSS)' software, 24-version.A Chi-square test was used to observe the relationship of menstrual disorders with the level of psychological stress among the students. A p-value < 0.05 was considered statistically significant for all tests.

Institutional Review Board Statement:

Permission was taken from the Institutional Review Board (IRB) of Rajshahi Medical College (RMC), Rajshahi before the starting of the study regarding the study design, methodology and target population characteristics.

Results

Table I: Distribution of the students by their different variables (n=247).

Variables	Mean±SD	Range
Age (Years)	21.89 ± 1.44	19 – 25
Age of menarche (Years)	12.01 ± 1.37	8 – 16
BMI (kg/m ^{2})	22.07 ± 3.34	14.12 – 34.35
Monthly family income (taka)	41874.49±20436.26	10,000-1,00,000
Menstrual cycle length (days)	30.66 ± 6.43	15-48
Duration of flow (days)	5.26 ± 1.59	1-11

Table I shows the mean age of the students was 21.89 ± 1.44 years, age of menarche was 12.01 ± 1.37 years, BMI 22.07 ± 3.34 kg/m2, monthly family income 41874.49 ± 20436.26-taka, menstrual cycle length 30.66 ± 6.43 days and duration of flow 5.26 ± 1.59 days.

Table II: Marital status, residence and present living situation of the student (n=247).

Variables	Frequency	Percentage (%)
Marital status		
Married	26	10.50
Unmarried	221	89.50
Residence		
Rural	60	24.30
Urban	187	75.70
Present living situation		
With family	36	14.60
Hostel	211	85.40

Table II reveals that 89.50% of students were single and 10.50% married. Most students (75.70%) were urban and 24.30% rural. Currently, 85.40% of students live in hostels and 14.60% with families.

Table III: Distribution of the students by presence of various menstrual disorders and psychological stress level (n=247).

Menstrual disorders	Frequency		Percentage (%)
Oligomenorrhea	Yes	50	20.24
	No	197	79.76
Polymenorrhea	Yes	13	5.26
	No	234	94.74
Hypomenorrhea	Yes	17	6.88
	No	230	93.12
Menorrhagia	Yes	18	7.29
	No	229	92.71
Levelsofpsychological stress	Low stress	9	3.60
	Moderate stress	191	77.30
	High stress	47	19.00

Table III demonstrates that 20.24% of students had oligomenorrhea, 6.88% hypomenorrhea, 7.29% menorrhagia, and 5.26% polymenorrhea. Most of the students (77.30%) were moderately stressed. 19.00% had high and 3.60% had low stress.

Table IV: Relationship between the menstrual disorders and level of psychological stress among the students (n=247).

Variables	Levels of psychological stress			p-value
	Low stress	Moderate stress	High stress	
Oligomenorrhea	1 (11.10%)	25 (13.10%)	24 (51.10%)	< 0.001
Polymenorrhea	0 (0%)	10 (5.20%)	3 (6.40%)	> 0.05
Hypomenorrhea	1 (11.10%)	12 (6.30%)	4 (8.50%)	> 0.05
Menorrhagia	0 (0%)	9 (4.70%)	9 (19.10%)	< 0.01

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In Table IV, oligomenorrhoea and menorrhagia were found to significantly correlate with psychological stress in medical students ($p < 0.001$ and $p < 0.01$, respectively). Both hypomenorrhea and polymenorrhea did not significantly affect psychological stress in medical students ($p > 0.05$).

Discussion

The average age of students in this study was 21.89 ± 1.44 years. Alshdaifat et al.[10] observed similar results, with a mean student age of 21.6±2.2 years. Nagma et al.[11], Alshayeb and Sakka[12], and Khaleel[13] observed similar results. Kollipaka et al.[14] obtained different results.

This study found that 89.50% of students were single and 10.50% were married. Alshayeb and Sakka[12] reported 87.0% of students were single. Alshdaifat et al.[10], Alhammadi et al.[15], and Rafique and Al-Sheikh[7] reported comparable results. In this study, 85.40% of students lived in hostels and 14.60% with families. Alshdaifat et al.[10] and Alshayeb and Sakka[12] found different results.

In the study, students had a mean BMI of 22.07±3.34 kg/m^2. Khaleel[13] reported similar results, with a mean BMI of 22.71 ± 6.369 kg/m^2. The mean student BMI in Nagma et al.[11] was 20.91 kg/m^2, which contradicted the findings. Different eating habits in different regions may explain the differences.

The mean age of menarche in this study was 12.01±1.37 years. Cakir et al.[16] observed similar results, with a mean menstrual age of 12.8 ± 1.3 years. Singh et al.[17], J et al.[18], Alshdaifat et al.[10], Alhammadi et al.[15], Khaleel[13], and Rigon[19] found similar results. In contrast, Esimai and Esan[5] observed a mean menarche age of 14.2 years. Mishra and Mukhopadhyay[20] and Verma et al.[21] observed conflicting results.

This study found a mean menstrual blood flow length of 5.26 ± 1.59 days. Similarly, Lakkawar et al.[4] found a mean menstrual blood flow length of 4.25 ± 0.5 days. Climate and seasonal change may explain these differences. Adolescent females suffer more from hormone imbalances and longer or more frequent periods in summer. The study found 20.24% of students had oligomenorrhea. Lakkawar et al.[4] observed 21% of students experienced oligomenorrhoea, like the study. Alshayeb and Sakka[12] discovered oligomenorrhea in 5% of students, lower than the study. Research found 7.29% of students experienced menorrhagia. Alshayeb and Sakka[12] observed 7% of students experienced menorrhagia, like the study. Alshayeb and Sakka[22] found 8.6% of students had menorrhagia, greater than the research. Also, Houston et al.[23] obtained different results.

The recent study found 5.26% of medical students had polymenorrhea. Lakkawar et al.[4] discovered that 8% of students had polymenorrhoea. Rafique and Al-Sheikh[7] discovered polymenorrhoea in 13% of pupils.

The study found that 77.30% of students had moderate stress, 19.00% had high stress, and 3.60% had low stress, with a mean perceived stress scale score of 22.03 ± 4.78. Khaleel[13] obtained similar results. In contrast, Achmad et al.[24] observed that 55.8% of students had severe stress, 36.5% moderate, 5.8% extremely severe, and 1.9% mild. Kollipaka et al.[14] obtained different results.

A strong correlation ($p < 0.001$) was identified between oligomenorrhoea and psychological stress among students in this study. Alshayeb and Sakka[12] obtained similar results.

This study observed no correlation between hypomenorrhea and student psychological stress ($p > 0.05$). Nagma et al.[11] observed similar results. Researchers found a substantial correlation between menorrhagia and psychological stress in medical students ($p < 0.01$). Khaleel[13] observed a statistically significant association between menorrhagia and psychological stress in medical students. Khaleel[13] obtained similar results. However, Zhou et al.[25], Sood et al.[26], Nagma et al.[11], and Fenster et al.[6] observed different results. Different study methodology and regional variance may explain these inconsistencies.

This study revealed no correlation between polymenorrhea and student psychological stress ($p>0.05$). Alshayeb and Sakka[12] obtained similar results.

Conclusion

There was a really high prevalence of stress among these students and it was also associated with the occurrence of various menstrual disorders. So, all medical faculties should set up procedures for the early detection of students with stress and menstruation disorders which might be helpful for prevention of various diseases.

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Conflict of interest

Authors declared no conflict of interest.

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