ORIGINAL ARTICLE

Association of Menstrual Cycle Pattern with Perceived Stress Score among Student and Staff Nurses

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ABSTRACT

Aims: To determine the menstrual cycle patterns among student and staff nurses and to compare levels of perceived stressed score and determine its association with menstrual cycle pattern.
Study design: Cross-sectional study
Place and duration of study: Shaikha Fatima Institute of Nursing and Health Sciences Lahore from 1st February to 1st July 2021.
Methodology: One hundred and fifty participants aged 18 years containing information related to menstrual cycle patterns and problems related to menstrual cycle and perceived stress scale questionnaire.
Results: Most common premenstrual symptom was generalized pain was found in 20 (26.0%) of student nurses and 12 (16.0%) of staff nurses. Mood swing was found to be highest among the negative effects of menstrual cycle reported by 39 (52.0%) of students and 35 (46.7%) staff nurses. No statistically significant difference was found between perceive stress scores of student and staff nurses.27.3% of participants having high level of perceived stress score were also experiencing irregular cycle. It was observed that irregular patterns of menstrual cycle was highly associated with high perceived stress score (p < 0.0001).
Conclusion: Irregular menstrual cycle among student and staff nurses were strongly related with perceived stress score. Therefore, it was suggested that student and staff nurses should be counselled by psychologist as well as by a gynecologist in order to prevent future complications.
Keywords: Perceived stress score, Menstrual cycle pattern, Menstrual irregularities

INTRODUCTION

The stress is usually being referred as a chronic or acute negative form of stress, which can be due to the death of a loved one or having too much workload and burdens at school or work place[1]. A woman's ability to have a normal menstrual cycle can be hampered by a variety of factors, including abrupt weight loss, excessive exercise, medical issues, and even stress. Major depression is linked to both prolonged menstrual bleeding and irregular menstrual cycles[2]. In response of stress the levels of cortisol and corticotropin-releasing hormone (CRH) are increased in the body help control.[3] The release of cortisol and corticotropin releasing hormone can inhibit reproductive hormones to be released normally which in turn potentially lead to anovulationor amenorrhea and also negative pregnancy outcomes, such as preterm birth.[4] In a study it was reported that high stress was associated with both anovulation and longer cycles in female nurses. These findings were also associated with rotation in night shiftsthat is very common for staff nurses.[5] On the contrary; high stress due to jobs has also been related to the shorter menstrual cycles. Also dysmenorrhea was linked to stress due to employment that were insecure and had little support from co-workers, according to a study.[6] People who have experienced dysmenorrhea in the past may be more susceptible to this impact[7].

As previously stated, the various impacts of stress may be attributable in part to timing. Higher levels of stress reported throughout the follicular period (from the first day of menstruation to ovulation) have been linked to abnormalities in normal reproductive function. Women who did not report stress, when compared to those who reported pre-ovulatory stress (during the follicular phase) were less likely to become pregnant[8]. This shows that stress may cause ovulation to be delayed or completely suppressed. The impact of stress on erythrocyte abnormalities varies according to the stage of the menstrual cycle. Variations in the sex hormone, which are produced by the action of stress, are responsible for early or late periods.[9] Menstrual abnormalities were

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twice as likely in those who were stressed out at school[10]. The way your cycle works might also be influenced by stress. A certain group of hormones controls your monthly cycle. Stress, for example, might disrupt the balance, causing your menstruation to be disrupted. Cortisol, a stress hormone, affects the amount of oestrogen and progesterone produced. When you have too much cortisol in your system, it can impact everything from your cycle's flow to its length. Menstrual abnormalities are caused by several factors, including stress. The length and duration of the menstrual cycle have been linked to stress on numerous occasions[11].

The objectives of the study were to determine the menstrual cycle patterns among student and staff nurses and to compare levels of perceived stressed score and determine its association with menstrual cycle pattern.

MATERIALS AND METHODS

This cross-sectional study was conducted at Shaikha Fatima Institute of Nursing and Health Sciences Lahore from 1st February to 1st July 2021. A total of 150 candidates participated in this study, 75 were student nurses and 75 staff nurses. Candidates already having any psychiatric illness were excluded. Demographic information including age, marital status, residential status, family size, department of work and working hours were noted. Then each candidate was asked about history of menstruation including cycle length, duration of flow, menstrual blood loss, and premenstrual symptoms i.e. generalized pain, headache, tiredness, bloating, tender breast, acne and negative effects of menstruation like loss of appetite, mood swings and anger were asked.

Pattern of menstrual cycle was asked from each subject including regular/irregular menstrual cycle, amenorrhea, menorrhagia, dysmenorrhea and abnormal vaginal bleeding as per operational definitions. Perceived Stress Scale was distributed among the candidates, 10 questions were asked to each subject, responses were assigned score as 0-never, 1-almost never, 2 sometimes, 3 fairly often, 4- very often. The total score ranged from 0- 40. Score ranging from 0-13 would be considered as low stress, Scores ranging from 14-26 would be considered as

moderate stress, Scores ranging from 27-40 would be considered as higher perceived stress. The data was entered and analyzed through SPSS22. Association between menstrual cycle pattern (regular/irregular) and levels of psychological stress was determined by applying Chi-square test for both staff and students separately. P≤0.05 was taken as significant.

RESULTS

There were 28(37%) were ≤20 years of age, 17(23%) between 21-25 years and 30 (40%) students were >25 years of age in nursing student. Only 9 (12%) were of age ≤20 years, staff nurses belonged to age group 21-25 years were 17(23%) and majority of staff nurses 49(65%) were >25 years of age in nursing staff. Twenty nine (39%) were living in their homes and 46(61%) were hostelites on the other hand the residential status of majority of staff nurses 68(91%) was home and only 7(9%) were living in hostels. There were 14(19

%) of students was ≤4 members, 55(73%) was 5-8 members and 6(8%) was >8 members respectively while 28(37%) of staff nurses were belonged to a family having <4 members, 36(48%) were from a family with 5-8 members and the family size of 11(15.0%) was >8 members.60(80%) student nurses were single and 15(20.0%) were married, while majority of staff nurses were married 48(64%) and 27(36%) were unmarried. When department of work was asked to our participants 6(8%) student nurses and 15(20%) staff nurses were working in OT, 10(13%) and 7(9.3%) were working in ICC, 2(2.7%) and 1(1.33%) were working in CCU and 57(76%) and 52(69.3%) were working in other departments, 30(40%) students and 25(33%) staff nurses were working for 36 hours, 21(28%) and 34(45.3%) were working for 48 hours, 21(28%) and 13(17.3%) were working for 72 hours and 3(4%) of student and staff nurses were working for >72 hours (Table 1).

The menstrual cycle length of <21 days was found in 6(8%) of student nurses and 8(10.7%) in staff nurses, 45(60%) of student nurses and 30(40%) of staff nurses had cycle length of 21-27 days, 24(32%) of student nurses had menstrual cycle of 28-35 days but no student(0%) had cycle length of >35 days, while in staff nurses the cycle length of 28-35 days was found in (48%) of staff nurses and only 1(1.3%) of staff nurses had menstrual cycle of >35 days. Twenty four (32%) students and 32(43%) staff nurses were had duration of flow 2-4 days, 47(63%) and 40(53%) had flow for 5-7 days and >7 days of menstrual blood flow was in (5%) of students and 4 (4%) staff nurses. In student nurses 54(72%) had blood loss of <5 pads/day, 21 (28%) had 5-7 pads/day and no student had menstrual blood loss of >7 pads/day while in staff nurses 61 (81%) had menstrual blood loss <5 pads/day, 14 (19%) had 5-7 pads/day and no staff nurse had menstrual blood loss >7pads/day (Table 2).

The most common premenstrual symptom was generalized pain and it was found in 20(26%) of student nurses and 12(16%) of staff nurses. One (1.03%) of student and 5(6.7%) of staff nurses had headache, history of tiredness was found in 7(9.3%) of students and 9 (12%) staff nurses. Fifteen (20%) of student nurses and 25(33.3%) of staff nurses claimed that they had all of the above mentioned premenstrual symptoms but 32(43%) of students and 24(32%) staff nurses told that they never experienced such symptoms. Each candidate was asked about the negative effects of menstruation, the most common effect was mood swings which was found in 39(52%) of students and 35 (46.7%) in staff nurses, 7(9.3%) of students and 10(13.3%) staff nurses claimed that they loss their appetite during menstruation. Twenty nine (39.7%) students and 30(40%) staff nurses were those who had both negative effect (mood swings and loss of appetite) [Table 3].

According to Perceived Stress Scale (PSS), in student nurses 10(13.3%) had low, 62(83.7%) had moderate and 3(4%) students had severe psychological stress same as 14(18.7%) staff nurses had low, 57(76%) moderate and 4(5.3%) severe psychological stress. There is a statistically insignificant difference between the stress levels of student and staff nurses. 128 candidates had regular menstrual cycle when the stress levels in these candidates was assessed then 19(14.8%) participants had low stress, 107(83.6%) had moderate stress and 2(1.6%) had high psychological stress according to PSS, on the other hand among candidates who had irregular menstrual cycle 5(22.7%) had low, 11(50%) had moderate and 6(27.3%) had high level of psychological stress and p-value was obtained 0.0001 means there is

an association between pattern of menstrual cycle and Psychological stress in nurses (Table 4).

Table 1: Characteristics of study participants

Variable	Student	Staff
Age (years)		
≤20	28 (37%)	9 (12%)
21-25	17 (23%)	17 (23%)
>25	30 (40%)	49 (65%)
Residence		
Home	29 (39%)	68 (91%)
Hostel	46 (61%)	7 (9%)
Family size (members)		
≤ 4	14 (19%)	28 (37%)
5-8	55 (73%)	36 (48%)
>8	6 (8%)	11 (15%)
Marital status		
Single	60 (80%)	27 (36%)
Married	15 (20%)	48 (64%)
Department of work		
OT	6 (8%)	15 (20%)
ICU	10 (13.3%)	7 (9.3%)
CCU	2 (2.67%)	1 (1.33%)
Other	57 (76%)	52 (69.3%)
\Working hours		
36	30 (40%)	25 (33%)
42	21 (28%)	34 (45.3%)
72	21 (28%)	13 (17.3%)
> 72	3 (4%)	3 (4%)

Table 2: History of menstrual cycle among students and staff nurses

Variable	Student	Staff
Cycle length (days)		
<21	6 (8%)	8 (10.7%)
21-27	45 (60%)	30 (40%)
28-35	24 (32%)	36 (48%)
>35	-	1 (1.3%)
Duration of flow (days)		
2 – 4	24 (32%)	32 (43%)
5 – 7	47 (63%)	40 (53%)
> 7	4 (5%)	3 (4%)
Menstrual blood loss (pads/day)		
< 5	54 (72%)	61 (81%)
5 – 7	21 (28%)	14 (19%)
> 7	-	-

Table 3: Premenstrual symptoms among student and staff nurses

Variable	Student	Staff
Premenstrual symptoms		
Generalized pain	20 (26%)	12 (16%)
Headache	1 (1.3%)	5 (6.7%)
Tiredness	7 (9.3%)	9 (12%)
All of above	15 (20%)	25 (33.3%)
No symptoms	32 (43%)	24 (32%)
Water retention		
Bloating	29 (38.7)	36 (48%)
Tender breast	15 (20%)	24 (32%)
Acne	15 (20%)	2 (2.6%)
All of above	16 (21.3%)	13 (17.3%)
Negative effect		
Loss of appetite	7 (9.3%)	10 (13.3%)
Mood swings	39 (52%)	35 (46.7%)
All of above	29 (38.7%)	30 (40%)

Table 4: Association of perceived stress score (PSS) with study variables

Variable	Levels of Psychological stress			P value
	Low (n = 24)	Moderate (n = 119)	High (n =7)	
Study groups				
Student Nurses	10 (13.3%)	62 (83.7%)	3 (4%)	0.60
Staff Nurses	14 (18.7%)	57 (76.0%)	4 (5.3%)	
Menstrual cycle pattern				
Regular	19 (14.8%)	107 (83.6%)	2 (1.6%)	0.0001
Irregular	5 (22.7%)	11 (50%)	6 (27.3%)	

DISCUSSION

Menstruation is a crucial sign of reproductive health and growth. A girl's physical, mental, and social well-being are negatively impacted by an abnormal menstrual pattern, which leads to additional problems and challenges during menstruation. Women's educational levels, stress levels, and sleep disturbances all have an impact on menstruation, resulting in atypical menstrual patterns. A modifiable factor, such as lifestyle changes, can help women avoid irregular menstruation patterns or their repercussions. Sixty (80%) student nurses and 68 (96%) staff nurses had regular cycles. No participant had amenorrhea, and menorrhagia was detected in only 2(2.7%) of staff nurses. Six student nurses (8%) suffered dysmenorrhea, while no staff nurse had dysmenorrhea. Only one student nurse (1.3%) reported abnormal vaginal bleeding, however this was not detected among staff nurses. Lower age at menarche in India could be due to inherited patterns, nutritional status, or climate changes.[12]

The most common premenstrual symptom in our study was generalized pain, which was reported by 20(26%) of student nurses and 12(16%) of staff nurses. 1 (1.03%) of students and 5(6.7%) of staff nurses experienced a headache, whereas 7(9.3%) of students and 9(12%) of professional nurses had a history of exhaustion. Although 15 (20%) of student nurses and 25 (33.3%) of staff nurses claimed to have encountered all of the above premenstrual symptoms, 32(43.3%) of students and 24(32%) of staff nurses said they had never experienced them. In Nagpur (India) found a similar outcome, with three-quarters of adolescent girls reporting menstrual issues[13]. Armour et al[14] reported that adolescent females with primary dysmenorrhea found that one-fifth of them were absent from school, and nearly half said their classroom performance, such as concentration levels or test-taking ability, was negatively affected during their menstrual cycle.

Each candidate was asked about the negative effects of menstruation, the most common effect was mood swings which was found in 39(52%) of students and 35(46.7%) in staff nurses, 7(9.3%) of students and 10(13.3%) staff nurses claimed that they loss their appetite during menstruation. 29(39.7%) students and 30(40%) staff nurses were those who had both negative effect (mood swings and loss of appetite). Dysmenorrhea is exacerbated by anxiety and mental tension brought on by stress[15]. The physiologic process is still unknown, but it's thought to be linked to the complicated interplay of hormonal, neurological, and behavioural components involved with PMS.[16] If the corticotrophin-releasing hormone system is activated as a physiological response to stress, it might impair menstrual function.[17] Another study discovered even more severe effects of dysmenorrhea, with more than three-quarters of adolescent girls reporting school abstinence, two-thirds reporting loss of concentration, nearly half reporting loss of participation, and only a few reporting a reduction in test taking skills in classes.[18]

According to Perceived Stress Scale (PSS), in student nurses 10(13.3%) had low, 62(83.7%) had moderate and 3(4%) students had severe psychological stress same as 14(18.7%) staff nurses had low, 57(76%) moderate and 4(5.3%) severe psychological stress and statistically insignificant difference between the stress levels of student and staff nurses. Although high stress levels during the menstrual cycle have been reported in various studies among young women and have been linked to menstrual irregularities[11,19] a study in Iran found that stress may not be the sole cause of menstrual pain, but it may be one of the factors that leads to dysmenorrhea[19,20]. Another study in China discovered that high stress levels were linked to dysmenorrhea[17].

In our study 128 candidates had regular menstrual cycle when the stress levels in these candidates was assessed then 19(14.8%) participants had low stress, 107(83.6%) had moderate and 2(1.6%) had high psychological stress according to PSS, on the other hand among candidates who had irregular menstrual cycle 5(22.7%) had low, 11(50.0%) had moderate and 6(27.3%) had high level of psychological stress and P-value was <0.05 means there is an association between pattern of menstrual cycle and psychological stress in nurses.

High levels of perceived stress have been linked to a higher likelihood of menstruation irregularity, according to other research[19,21,22] The physiological mechanism underlying irregular menstruation and amenorrhea is unknown, however it may be linked to stress-induced extended stimulation of the hypothalamic-pituitary adrenal axis, which alters hormonal profiles and disrupts normal ovulation and menstruation[19]. High daily stress was linked to reduced total and free E2, LH, luteal progesterone, increased chances of irregular anovulation in contrast with low stress and higher FSH levels[23]. Other stress hormones, including as adrenaline and cortisol, affect prostaglandin synthesis and binding in the myometrium, which could explain why stress is linked to dysmenorrhea[17]. While more research is needed to establish the physiologic aetiology of menstrual irregularity.

CONCLUSION

Menstrual disorders were common among student and staff nurses, and they can have a significant influence on their quality of life. High levels of stress are linked to irregular menstrual cycles and the intensity of menstrual symptoms.

Conflict of interest: Nil

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