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Effect of educational stress on menstrual cycle in female
medical students

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ABSTRACT

Background :Recently educational stress became a problematic issue to college students due to increase deadlines and competition between students. This stress had an affect on physical and mental health of students. High stress levels have influence on neuro-endocrine axis which can lead to menstrual changes

Aim : to study the correlation between levels of educational stress and incidence of menstrual changes among medical students in comparison with non medical students

Material and methods: study was done on (600) students (400) was medical and 200 was non medical students. The evaluation was done by questionnaire that asked about length , flow , pattern , dysmenorrhea related to stress.

Results : significant association between stress and dysmenorrhea p (0.00001) . Other less prevalent associations were heavy menstrual bleeding . Most of these changes occurred in clinical years of academic study . Medical students had higher percentage than non medical facilities.

Keywords : educational stress , comparison , mental health , medical students , menstrual changes , dysmenorrhea , anxiety , stress coping

Introduction

With the expansion of college students every year , competition and challenges become the root to study more in order to obtain remarkable grades and this in turn puts a pressure or stress on students' shoulder. Although such kind of stressors considered good because it rises the levels of competition , experience excessive or chronic stress can lead to psychological disturbances [1].

The definition of stress is the exaggeration of physiological reactions including mental and physical reactions to reach self preservation[2].external demands and expectations in academic life of medical students are the most important factors of stress [3].

It is worth mentioning that reasonable level of stress required among students for good and healthy competition but when it turns into anxiety and chronic stress , series of deleterious effects (psychological and physical) start to appear[4]. Recently ,stress among students in the field of medicine starts to increase year by year [5]. When it comes to compare stress response in men and women ,it shows that men respond higher to stressful situations as a result of higher cortisol hormone, blood pressure and epinephrine than women [6] [7].

Moreover, research studies show that bad stress has negative impact on hypothalamus pituitary ovarian axis through which undesirable level of corticotropin released hormone and that in turn creates disturbances in duration and length of menstrual cycle . Normal length is 21 to 35 days and duration would take 3-7days in healthy adults [8].[9].[10].

In addition to that studies also presents the link between bad stress and dysmenorrhea in college students which at the end affects on society by losing productivity. Hence dysmenorrhea can be defined as painful menstruation that classified in two categories, primary one excluded pelvic pathologies and secondary included pelvic pathology or other chronic diseases [11].

Patients and methods

Total of (600) female college students of age (17-25) were participated in this cross sectional study during the period from fifteenth of August 2022 to fifteenth of January 2023 after obtaining informed consent from them .

(400) of females were medical students in Diyala university .
While the rest (200) were non medical students belong to (law , engineering, biology colleges) all of them studying in Al-Yarmook university from stage one to final stage .

Exclusion criteria were only female with history of neurological , psychological disorders , medical or surgical history, any medications affecting emotional or endocrinological state or any drug or hormone .

The student were asked to fill questionnaire related to stress and menstrual changes. Which include (duration of menstruation days , regularity, perception of blood amount , any menstrual changes occurs during stressful conditions, type of the change)

Statistical analysis

The data analyzed using statistical package for the social Science (SPSS) for windows version 16. . The analysis done through Chi-square for independence test between traits to detect significant relationships among factors. A p value smaller than 0.05 was considered statistically significant.

Results

From data collection conducted on students of the faculty of medicine university of Diyala as many as 400 respondents and non medical students of Al Yarmook university as many as 200 respondents

Table 1 shows that from 599 respondents there are 299 at (less than 20 years old age group) just 36.3% have menstrual changes related to stress while older respondents who at (more than 25 years old age group) 89.5% have no menstrual changes related to stress which is statistically significant

According to marital status, 572 are single which 55.4% from them have no menstrual changes while in married respondents (81%) have no changes which is statistically significant

According to study year of respondents , the highest level of menstrual changes was found in fourth stage (67.2%) while the lowest one was found in second stage (33.1%) which is statistically significant

Table 1. sociodemographic characteristics of students

Characteristics	No n(%)	Yes n(%)	Total n(%)	P value
Age				0.000001
Less than 20	190(63.5%)	109(36.5%)	299(100.0%)	
21 to 24	132(47.0%)	149(50.3%)	281(100.0%)	
More than 25	17(89.5%)	2(10.5%)	19(100.0%)	
Marital status				0.008
Single	317(55.4%)	255(44.6%)	572 (100.0%)	
married	22(81.0%)	5(18.5%)	27(100.0%)	
Address				0.844
Urban	308(56.7%)	235(43.3%)	543(100.0%)	
Rural	31(55.4%)	25(44.6%)	56(100.0%)	

In comparison between medical and non-medical students, the percentage of menstrual changes related to educational stress is slightly higher in medical students (43.6%) than non-medical students (43.0%) but this statistically non-significant P-value 0.892.

Regarding to study year of respondents, the highest level of menstrual changes was found in fourth stage (67.2%) while the lowest one was found in second stage (33.1%) which is statistically significant P-value 0.000001. As shown in table 2

Table 2. relation between menstrual irregularities during exams in female medical and non medical students according to study year

characteristics	No n(%)	Yes n(%)	Total n(%)	P value
college medical non medical	299(56.4%) 110(57.0%)	177(43.6%) 83(43.0%)	406(100.0%) 193(100.0%)	0.892
Study year First Second Third Forth Fifth Sixth	141(61.3%) 87(66.9%) 69(53.1%) 19(32.8%) 9(39.1%) 14(50.0%)	89(38.7%) 43(33.1%) 61(46.9%) 39(67.2%) 14(60.9%) 14(50.0%)	230(100.0%) 130(100.0%) 130(100.0%) 58(100.0%) 23(100.0%) 28(100.0%)	0.000001

According to table 3 below, from 599 respondents 516 of them have regular cycle and majority of them not affected by educational stress 57.4%, the other 83 had menstrual irregularity which was not affected by stress 43% which was statistically non-significant P-value 0.343. Regarding to duration of menstrual flow, majority of respondents whether had 8 or less days of flow or those had more than 8 days of menstrual flow not affected by

educational stress 56.5%, 57.4% respectively which was statistically non-significant P-value 0.896.

About the perception of menstrual flow all the respondents whether had light flow (< 2 pads/day) or normal flow (2-4 pads/day) or heavy flow (> 4 pads/day) 72.9%,54.6%,52.7% respectively not affected by educational stress these findings were statistically significant P-value 0.14

Table 3 . pattern of menstrual cycle among female college students

characteristics	No n(%)	Yes n(%)	Total n(%)	P value
Regularity of menstrual cycle				0.343
Regular	296(57.4%)	220(42.6%)	516(100.0%)	
irregular	43(51.8%)	40(48.2%)	83(100.0%)	
Duration of menstrual flow				0.896
Less or equal 8 days	304(56.5%)	234(43.5%)	538(100.0%)	
More than 8 days	35(57.4%)	26(42.6%)	61(100.0%)	
Perception of menstrual flow				0.014
Less than 2 pads per day	51(72.9%)	49(27.1%)	70(100.0%)	
2-4 pads per day	259(54.6%)	215(45.4%)	474(100.0%)	
More than 4 pads per day	29(52.7%)	26(47.3%)	55(100.0%)	

Table 4 demonstrate type of irregularities during examinations stress , that from 599 respondents there are 76.5% had no menstrual changes in stress while 61.5% have dysmenorrhea, 42.3% have heavy bleeding , 35.3% have oligomenorrhea , 54.2% use medications for these menstrual changes , all of these findings were statistically highly significant P-value 0.000001.

Table 4. type of menstrual cycle changes during examinations according to menstrual history

Type of menstrual change	No n(%)	Yes n(%)	Total n(%)	P value
No changes	179(76.5%)	55(23.2%)	234(100.0%)	0.000001
Oligomenorrhea	11(64.7%)	6(35.5%)	17(100.0%)	
Dysmenorrhea	104(38.5%)	106(61.5%)	270(100.0%)	
Heavy bleeding	45(57.7%)	33(42.3%)	78(100.0%)	

Discussion

In our study which is done in Diyala university , we studied the relationship between stress of examinations and menstrual changes among students in all stages in both medical and non medical faculties

The present research studies the sociodemographic characteristics of students in relation to menstrual changes, according to age group of respondents we found the higher percentage of menstrual changes occur in age group (21-24 years old) while lesser numbers of students at 25 years old which is statistically significant , that agrees with Aclan O.et al . [12] Who found high prevalence of menstrual changes in age group more than 20 years old students .

Regarding marital status we found majority of menstrual changes occurred in unmarried students which is statistically significant, this agree With Coombos R. et al. [13] who found that stress prevalence is higher in single students and declining after marriage.

In relationship between address and menstrual change our study found most of changes occurred in students who lives in Rural area which is statistically non significant , this agrees with Steve J. et al .[14] who studied the stress level in rural areas and found a higher prevalence of stress in females of rural areas but disagree with .SURESH P [15] who found The urban student"s academic stress is higher than rural student which statistically non significant in his study

In comparison between stress effects between medical and non medical students

Our study found slightly higher percentage in medical students which is statistically nonsignificant this agrees with Iram S. et al. [16] who found higher stress levels in medical students which statistically significant in his study

Our study showed the effect of academic year on menstrual changes that we found most of changes occurred in clinical years and less in preclinical, which corresponds with previous study was done by Mini S. et al. [17] who found no significant association between stress level and menstrual changes among preclinical medical students

But this disagrees with Madina M. et al. [18] who found that the first and last years of college have higher stress levels due to need of adaptation and getting diploma respectively, this disagreement with our study can be explained by Few numbers of professors and less learning facilities in our teaching hospitals these induced higher stress levels among clinical years students.

According to the pattern of menstrual cycle and the effect of stress, the majority of respondents have regular cycles in both stressful and non stressful conditions, there's no effect of stress on menstrual regularity. This disagrees with Kazuhiko.Y.et al.[19] who found Increase incidence of menstrual irregularities among students with higher stress scores in comparison with students of less scores. This can be explained by higher stress levels among Japanese college students and more deadlines and workload.

About the effect of stress on the duration and perception of menstrual flow among respondents, the majority of students have menstrual flow less than 8 days in both stressful and non stressful conditions, there's no effect of stress on duration of menstrual flow which is statistically insignificant. This agrees with an other study was done by Batool a. etal. [20]who found there's no correlation between stress level and duration of menstrual flow.

About the type of changes that occurs in response of stress examinations, we found the most frequent changes is dysmenorrhea that corresponds with previous study was done by ruchi S. et al. [1] who documented a significant association of increased stress scores with

painful periods. This also supported by Katwal et al .[21] who found Linear correlation between stress level and dysmenorrhea .

This can be explained by distribution of hypothalamus -pituitary-ovarian axis by stress

Stress induced high cortisol levels which can effect on hypothalamus this theory supported by Yurike S . et al.[22] who found a significant association between cortisol levels and dysmenorrhea among nursing college students during examinations.

An other menstrual change was reported in our study is heavy bleeding

And oligomenorrhea which documents stress effects on amount of menstrual blood , This disagree with Shahida N. et al.[23] ,who found there's no association between stress level and amount of blood which is explained by author due other causes rather than stress The dis agreement with our study maybe due to differences between number of respondents and unawareness to gynaecological problems in our society.

Conclusion

1- educational stress is high prevalence among medical students females.

2- stress induced menstrual changes , most prevalent change in our study is dysmenorrhea

3- menstrual changes occurs in clinical years students more often than preclinical one .

4- menstrual changes occurs more often among medical students in comparison with non medical due to higher stress levels

References

1. Ruchi s., Renuka S ,Heena R, Impact of stress on menstrual cycle : comparison between medical and non medical students . Saudi journal for health sciences 2015;115 :199 .4(2)
2. H.Brand. , Meta S., Is the Osce more stressful ? Examination anxiety and its consequences in different assessment methods in dental education. European journal of dental education. 2009;147:158. 13(3).
- 3.Luana N. Bataral I. Gerald M. The relationship between stress levels and menstrual cycle regularity in students of faculty of medicine, universitas Kristen Indonesia , class of 2017 . International Journal of medical and health research 2021 ;72:75 .2(4) .
4. Parikh H. , Barhatt J. ,stress levels and immediate examination performance of medical students. International archives of integrated medicine 2015 ;30:36 .2(5).

5. Majed M. , Muhamad S. , Ahmed F . Assessment modalities that provokes tesr anxiety among medical students . Education in medicine journal 2022; 49:60. 14(2).

6. Nazime T ,Rushsan M., Ayse B . Educational stress , social stress and gender differences among universities students. Journal of educational and instructional studies in the world 2020;37:46 . 10(2).

- 7.Laura F , Kirsten W. ,John C. ,et al . Psychological stress in the workplace and menstrual function.American journal of epidemiology 1999;127:133 . 149(2).

8. Donna T , Maria A. , Hernan L. , et al. Stress and the Reproductive Axis , national library of medicine , 2014; 573:586.26(9).

- 9.Mario G. , Robert J. , Handa. Hypothalamic-pituitary-adrenal and hypothalamus-pituitary-gonadal axes : sex differences in regulation of stress responsivity . International Journal on the biology of stress 2017 ; 476:494. 20(5).

10. Andi A. , Andi B., Menstrual Cycle Length in Women Ages 20-30 years in Makassar . Journal of Physics 2019 ;335:239. 37(20).

11. Mariagiulia B. , Lucia L. , Federica P. , et al .dysmenorrhea and related disorders . National library of medicine 2017;1646 . 6(2).

12. Aclan Z. , Zeyneb S. the prevalence of dysmenorrhea and its effects on female university quality of life .International Journal of Clinical and Experimental Medicine 2020 ; 6496:6505.13(9).

13.Coombs R. , Fawzy F. , The effect of marital status on stress in medical school. The American Journal of Psychiatry, 1982; 1490:1493, 139(11).

14. Steve J. , Lisa B. et al. , Rural community stress, distress, and well-being in Pennsylvania, journal of rural studies, 1997;275:288. 13(3).

15.Dr.PSURESH P. , Study on Academic Stress among Higher Secondary Students, International Journal of Humanities and Social Science Invention, 2015; 63:68.4(10).

16.Iram S., Stress Level Comparison of Medical and Nonmedical Students: A Cross Sectional Study done at Various Professional Colleges in Karachi, Pakista , iMedPub Journals 2017 ; 2:8 . 3(2) .

17. Mini S. , Ambigga D. , Azlinawati , et al . Menses and stress related changes in female medical students. Procedia social and behavioural sciences 2012 ;123:127 .36(6).

18. Madina M. , Ben C. , Academic stress at different years of study , UDC 2020; 71:78 , 4(100).

19. Kazuhiko Y . , Ai O . , Yoko S . , et al . , The Relationship between Premenstrual Symptoms, Menstrual Pain, Irregular Menstrual Cycles, and Psychosocial Stress among Japanese College Students , journal of physiological and anthropology 2009; 28(3).

20. Batool A. , Sara A. , Mise A. , et al. , Menstrual Abnormalities and Their Association With Stress and Quality of Life Among Females Studying Health Sciences , research square 2021.

21. Katwal P. , Karki N. , Sharma P, Dysmenorrhea and Stress among the Nepalese Medical Student, KATHMANDU UNIVERSITY MEDICAL JOURNAL 2016 ;318:320.14(56).

22. Yurike S. , Nety M. , correlation between menstrual pain and level of cortisol among nursing students of NAHDLATUL ULAMA UNIVERSITY, SURABAYA ,INTERNATIONAL CONFERENCE OF KERTA CENDEKIA NURSING ACADEMY-2019 ; 163:168.

23. Shahida N. , Garima K. , Rekha B. , et al. To evaluate the effect of perceived stress on menstrual function , national library of medicine 2015 ; 1:3 , 9(3)