

Research Article

Association of Sedentary Lifestyle and Stress with Menstrual Irregularities

Sadia Ilyas^{1*}, Kiran Iqbal², Shaila Anwar³

^{1*}Assistant professor, Department of Obstetrics and Gynecology, Lahore Medical and Dental College /Ghurki Trust Teaching Hospital, Lahore.

²Assistant professor, Department of Obstetrics and Gynecology, Lahore Medical and Dental College /Ghurki Trust Teaching Hospital, Lahore.

³Professor, Department of Obstetrics and Gynecology, Lahore Medical and Dental College /Ghurki Trust Teaching Hospital, Lahore.

Corresponding Author: Sadia Ilyas

Email: drsadia777@yahoo.com

Received: 30.03.26, Revised: 22.04.26, Accepted: 26.05.26

ABSTRACT

Objective: To assess the effect of sedentary life style and stress on menstrual irregularities.

Materials and Methods: It was a cross sectional study conducted on 200 female doctors including undergraduate medical students of Lahore Medical and Dental College. Data was collected through convenient sampling during March 2022 to August 2022. Female doctors and female medical students were included in this study with normal BMI and between the age of 18-44 years. Data was analyzed through SPSS version 25. P value 0.05 was considered statistically significant.

Results: In our study, 200 female doctors were included. Out of 200 doctors, 165 doctors were found to be in stressful condition of variable severity. Comparison of irregular periods was done between stressed and non-stressed doctors and it was found that among stressed group, 95(57.6%) doctors had irregular periods and among non-stressed there were only 2 (5.7%) who had irregular periods. When chi square test was run to find the relationship of irregular periods with stressed and non-stressed doctors, there was a strong statistical association between two groups.

Conclusion: Our study presented that sedentary lifestyle and stress are associated with menstrual irregularities. Increase in sedentary lifestyle are among modifiable risk factors for menstrual cycle irregularities. It was a cross-sectional study and other risk factors were not studied in detail so relationship of different modifiable factors must be studied in future studies.

Keywords: BMI, Menstrual Irregularities, Sedentary Lifestyle, Stress.

INTRODUCTION

Now a days, sedentary lifestyle and inactivity are main challenges (1-3). Sedentary behavior is defined by the use of energy less than 1.5 metabolic equivalent of task (MET) of lying down or sitting (4). Physical inactivity can be presented as daily life activity in insufficient volume and not reaching at the level of recommended physical activity which is 150 minutes of moderate physical activity per week (4). Individuals can have physically active as well as sedentary behavior indeed (5,6). Physical inactivity and sedentary lifestyle may have multiple health risks, mortality and communicable diseases (1-3,7,8).

There are multiple diseases and ill health effects which are linked with sedentary behavior like diabetes mellitus, cardiovascular diseases, hypertension and cancers of breast, colon, epithelial ovarian cancers and endometrial cancers. These details are available in multiple studies (3,10,11). With

the passage of time, challenges in life are increasing and women are at greater risk. Pressure of work may lead towards psychosocial stressors like depression, stress and anxiety. Overall health as well as menstrual health can be affected due to stress of life. There is need of balance of androgens and estrogens sex hormones for normal menstrual cycle. There is increase in menstrual problems due to rise in BMI especially when it is greater than 25 (12).

Internationally, study of female reproductive health has gained importance especially from last decade (13). Regular normal menstrual cycle of a women range from 21-35 days and bleeding duration ends within 2-7 days. Change in normal cycle is also known as abnormal uterine bleeding (AUB). The key markers used to check the menstrual cycle pattern are frequency, regularity, heaviness of flow, and duration of flow, where each of these may show significant change (14). AUB

is counted as standard to check any deviation from routine pattern of menstrual cycle having duration of flow, length of cycle, and amount of bleeding etc. There is variation in menstrual cycle in every woman. In different cases, occurrence of AUB is due ovaries failure to release an egg that ultimately leads towards imbalance in hormones. There is relationship between psychological stress and hormonal imbalance and it contribute to menstrual irregularities (15). Obesity and advancement of endometrial polyps, ovulatory dysfunction and endometrial hyperplasia have apparent relationship that lead towards AUB (16). There is association of obesity with physical inactivity and sedentary behavior (17,18).

Both stress and sedentary lifestyle have direct impact on menstrual irregularities other than obesity. Objective of the study is to determine the association of stress and sedentary lifestyle with menstrual irregularities among females of normal BMI.

MATERIALS AND METHODS

It was a cross sectional study conducted on 200 female doctors including undergraduate medical students of Lahore Medical and Dental College. Data was collected through convenient sampling during March 2022 to August 2022.

Inclusion criteria: Female doctors and female medical students were included in this study with normal BMI and between the age of 18-44 years.

Exclusion criteria: Doctors with thyroid disorders and known psychological disorders, high BMI, known organic causes of menstrual irregularity, known coagulopathies

A questionnaire was provided to record and assess stress level after informed signed consent and menstrual cycle pattern including length, duration and change in flow was recorded in the second part of questionnaire. All female doctors who were having stress in their life were observed for their menstrual cycle in last 6 months. Data was analyzed through SPSS version 25. P value 0.05 was considered statistically significant.

RESULTS

In our study there were 200 females doctors included. Participants were evaluated regarding physical activity into 3 categories, those were inactive, minimally active and HEPA active. Out of 200 study participants, inactive, minimally active and HEPA active were 25, 123 and 52 respectively. Of 200 doctors, there were 165 doctors who had some form of stress. When comparison of irregular periods was done between stressed and non-stressed doctors, 95(57.6%) doctors had irregular periods and among non-stressed there were only 2 (5.7%) who had irregular periods. When chi square test was run to find the relationship of irregular periods with stressed and non-stressed doctors, there was a strong statistical association between two groups.

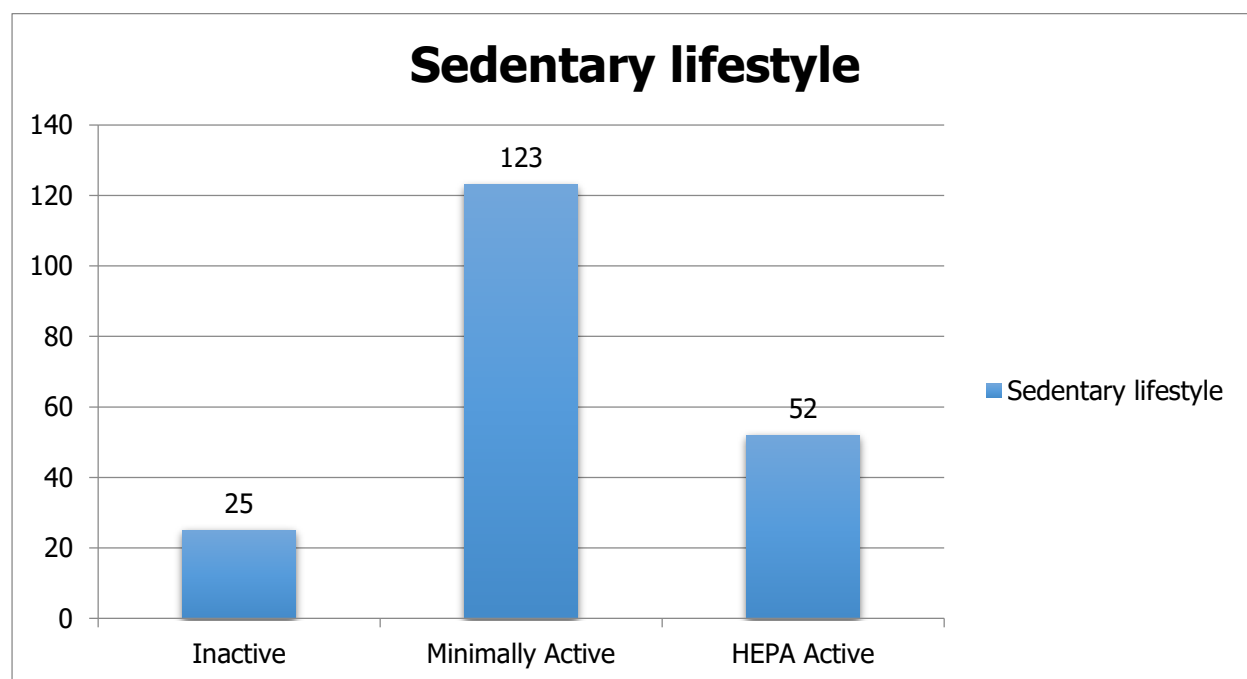


Figure 1: Sedentary Lifestyle among Doctors

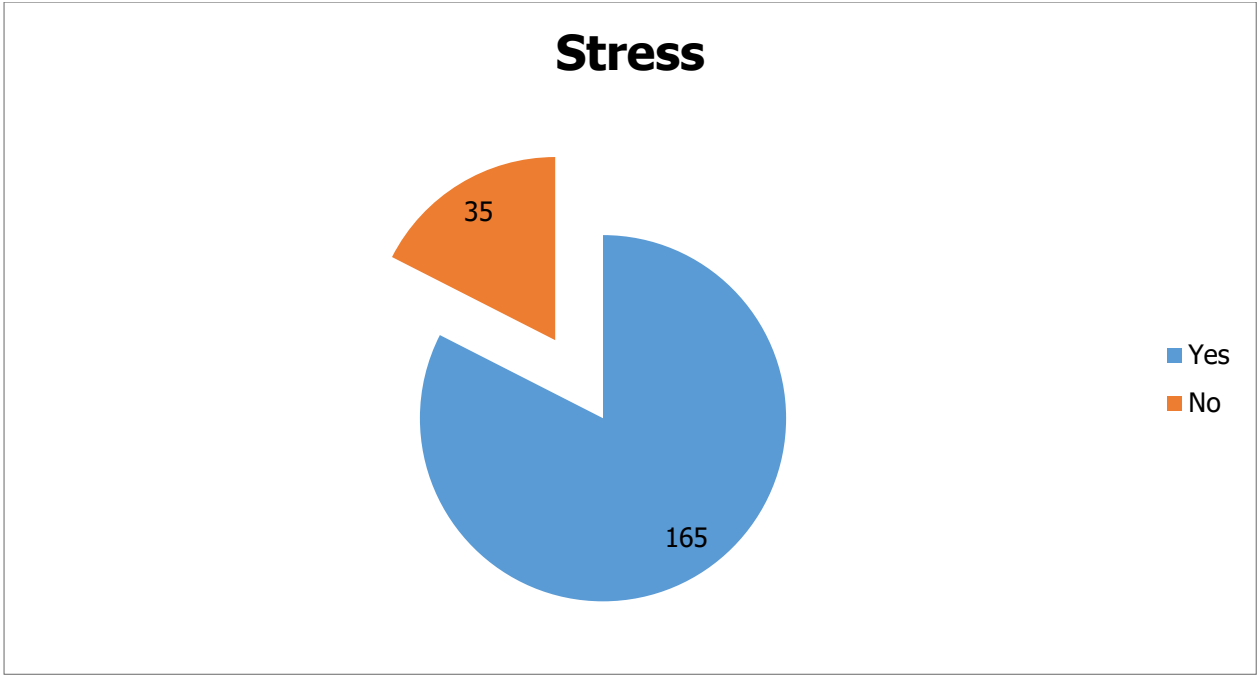


Figure 2: Frequency of Stressed and Non-Stressed Doctors

Table 1: Frequency and Percentage of Variables

Variable	Frequency	Percentage
Stressed	165	82.5%
Non-stressed	35	17.5%
Irregular periods among stressed (165)	95	57.6%
Irregular periods among non-stressed	2	5.7%

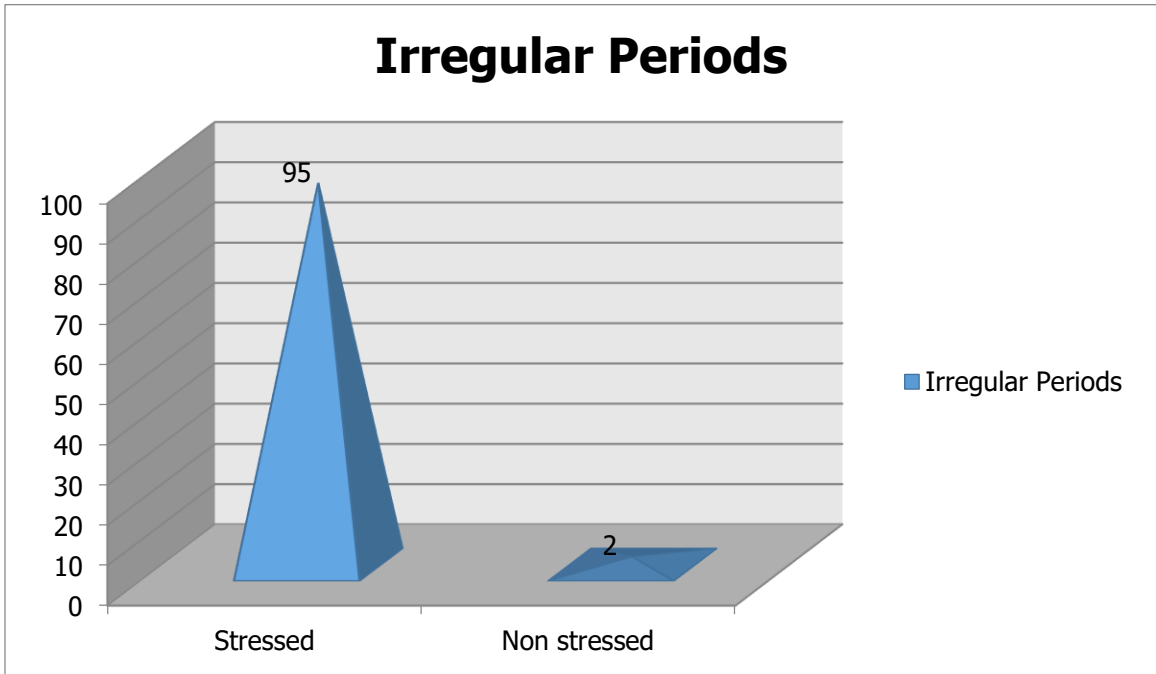


Figure 3: Irregular Periods among Stressed and Non-Stressed Doctors

Table 3: Association between Irregular Periods with Stress

Variables	Chi square test	P value
Stress and irregular periods	11.2	001

DISCUSSION

In our study, we investigated the role of sedentary lifestyle and stress in menstrual irregularities in females of normal BMI. Menstrual irregularity is considered as sign of hormonal imbalance. There are different risk factors which influence the menstrual cycle. Sedentary lifestyle and stress are considered as important factors in this regard. According to our results, sedentary lifestyle and stress are the key factors in irregularity of menstrual cycle. A study with similar results was conducted on 696 women of twenty to forty years of age and chronic stress was associated with irregularity of menstrual cycle (19). Among different studies, stress was checked among university students through Global Severity Index and Perceived Stress Scale and its correlation was assessed with irregular menstruation (20,21). Corticotropin is being released in the nervous system due to stress that may lead towards menstrual dysfunction (22,23). There is change in endocrine profiles due to environmental stress and have estrogen and gonadotropin lowering effect due to involvement of hypothalamus (24). As prolactin secretion increases, abnormality in menstrual cycle length, amount and duration of bleeding may happen and anovulation may occur (25,25,27,28). A study conducted on nurses suggested that there is effect of stress on menstrual function. There are multiple other studies but they are inconsistent with results and did not show significant relationship between stress and menstrual cycle (29,30,31).

According to one theory, menstrual cycle affected due to stress has involvement of HPO axis. Menopause occurrence is led by reduction of activity of HPO axis. There is interruption of HPO axis with the higher level of stress. That is the reason of more menstrual irregularities among women with higher level of stress (32).

In our study results, females with high BMI were excluded to avoid confounding effect of menstrual irregularities associated with obesity. A study conducted on Korean women presented the results that women with 25-29.9 BMI have higher prevalence of oligomenorrhea as compared to normal women. There have been reported longer menstruation among women those have abdominal obesity. Different studies reported that women with regular menstruation have normal BMI, WC and WHR than those have irregular menstruation (33).

CONCLUSION

Our study presented that sedentary lifestyle and stress are associated with menstrual irregularities. Increase in sedentary lifestyle are among modifiable risk factors for menstrual cycle irregularities. It was a cross-sectional study and other risk factors were not studied in detail so relationship of different modifiable factors must be studied in future studies.

REFERENCES

1. Biswas A, Oh PI, Faulkner GE, Bajaj RR, Silver MA, Mitchell MS, et al. Sedentary Time and Its Association With Risk for Disease Incidence, Mortality, and Hospitalization in Adults: A Systematic Review and Meta-analysis. *Ann Intern Med.* 2015; 162: 123-132.
2. Hamburg NM, McMackin CJ, Huang AL, Shenouda SM, Widlansky ME, Schulz E, et al. Physical inactivity rapidly induces insulin resistance and microvascular dysfunction in healthy volunteers. *Arterioscler Thromb Vasc Biol.* 2007; 27: 2650-2656.
3. Diaz KM, Howard VJ, Hutto B, Colabianchi N, Vena JE, Safford MM, et al. Patterns of Sedentary Behavior and Mortality in U.S. Middle-Aged and Older Adults: A National Cohort Study. *Ann Intern Med.* 2017; 167: 465-475.
4. Sedentary Behaviour Research Network. Letter to the Editor: Standardized use of the terms "sedentary" and "sedentary behaviours". *Appl Physiol Nutr Metab.* 2012; 37: 543-345.
5. Ashe MC. Physical Activity and Workplace Sedentary Behaviour. *Physiother Can.* 2012; 64: 1-3.
6. Omorou AY, Coste J, Escalon H, Vuillemin A. Patterns of physical activity and sedentary behaviour in the general population in France: cluster analysis with personal and socioeconomic correlates. *J Public Health.* 2015; 38: 483-492.
7. Fletcher GF, Landolfo C, Niebauer J, Ozemek C, Arena R, Lavie CJ. Promoting Physical Activity and Exercise: JACC Health Promotion Series. *J Am Coll Cardiol.* 2018; 72(14): 1622-1639.
8. Piercy KL, Troiano RP, Ballard RM, Carlson SA, Fulton JE, Galuska DA, George SM, Olson RD. The Physical

- Activity Guidelines for Americans. JAMA. 2018; 320(19): 2020-2028.
9. Vaamonde D, Da Silva-Grigoletto ME, Garcia-Manso JM, Vaamonde-Lemos R, Swanson RJ, Oehninger SC. Response of semen parameters to three training modalities. Fertil Steril. 2009; 92: 1941-1946.
10. Vaamonde D, Da Silva-Grigoletto ME, Garcia-Manso JM, Barrera N, Vaamonde-Lemos R. Physically active men show better semen parameters and hormone values than sedentary men. Eur J Appl Physiol. 2012; 112: 3267-3273.
11. Gaskins AJ, Mendiola J, Afeiche M, Jorgensen N, Swan SH, Chavarro JE. Physical activity and television watching in relation to semen quality in young men. Br J Sports Med. 2015; 49: 265-270.
12. Zhou X, Yang X. Association between obesity and oligomenorrhea or irregular menstruation in Chinese women of childbearing age: a cross-sectional study. Gynecol Endocrinol. 2020; 36(12): 1101- 1105.
13. Li K, Chen G, Hou H, et al. Analysis of sex hormones and menstruation in COVID-19 women of child-bearing age. Reprod Biomed Online. 2021; 42(1): 260- 267.
14. Fraser IS, Critchley HO, Broder M, Munro MG. The FIGO recommendations on terminologies and definitions for normal and abnormal uterine bleeding. Semin Reprod Med. 2011; 29(5): 383- 390.
15. Pandey AK, Gupta A, Tiwari M, et al. Impact of stress on female reproductive health disorders: possible beneficial effects of shatavari (Asparagus racemosus). Biomed Pharmacother. 2018; 103: 46- 49.
16. Reavey JJ, Duncan WC, Brito-Mutunayagam S, Reynolds RM, Critchley HOD. Chapter 19 - obesity and menstrual disorders. In: TA Mahmood, S Arulkumaran, FA Chervenak, eds. Obesity and Gynecology. Second ed. Elsevier, Stacy Masucci; 2020: 171- 177.
17. Preethi L, Ganamurali N, Dhanasekaran D, Sabarathinam S. Therapeutic use of Guggulsterone in COVID-19 induced obesity (COVIBESITY) and significant role in immunomodulatory effect. Obes Med. 2021; 24:100346.
18. Pellegrini M, Ponzo V, Rosato R, et al. Changes in weight and nutritional habits in adults with obesity during the “lockdown” period caused by the COVID-19 virus emergency. Nutrients. 2020; 12: 7.
19. SD Harlow and SA Ephross: Epidemiology of menstruation and its relevance to women’s health. Epidemiological Reviews 17, 265-286 (1995)
20. SD Harlow and GM Matanoski: The association between weight, physical activity, and stress and variation in the length of the menstrual cycle. American J of Epidemiology 133, 38-49 (1991)
21. MC Hatch, I Figa-Talamanca and S Salerno: Work stress and menstrual patterns among American and Italian nurses. Scand J Work Environ Health 25, 144- 150 (1999)
22. S Labyak, S Lava, F Turek and P Zee: Effects of shiftwork on sleep and menstrual cycle function in nurses. Health Care Women Int 23, 703-714 (2002)
23. GP Chrousos and PW Gold: The concepts of stress 13489585, 2005, 2, Downloaded from <https://onlinelibrary.wiley.com/doi/10.1539/joh.47.149> by INASP/HINARI - PAKISTAN, Wiley Online Library. See the Terms and Conditions (<https://onlinelibrary.wiley.com/terms-and-conditions>) on Wiley Online Library for rules of use; OA articles are governed by the ap and stress system disorders. JAMA 267, 1244-1252 (1992) 21)
24. GP Chrousos, DJ Torpy and PW Gold: Interactions between the hypothalamic-pituitary adrenal axis and the female reproductive system: clinical implications. Ann Intern Med 129, 229-240 (1998) 22)
25. MP Warren and NE Perlroth: The effects of intense exercise on the female reproductive system. J Endocrinol 170, 3-11 (2001) 23)
26. T Theorell, G Ahlberg-Hulten, M Jodko, F Sigala and BD Torre: Influence of job strain and emotion on blood pressure in female hospital personnel during workhours. Scand J Environ Health 19, 313-318 (1993)
27. Esmaeilzadeh S, Delavar MA, Basirat Z, Shafi H. Physical activity and body mass

- index among women who have experienced infertility. *Arch Med Sci.* 2013; 9: 499-505.
28. Bullock VE, Griffiths P, Sherar LB, Clemes SA. Sitting time and obesity in a sample of adults from Europe and the USA. *Ann Hum Biol.* 2017; 44: 230-236.
 29. Chau JY, van der Ploeg HP, Merom D, Chey T, Bauman AE. Cross-sectional associations between occupational and leisure-time sitting, physical activity and obesity in working adults. *Prev Med.* 2012; 54: 195-200.
 30. Ramlau-Hansen CH, Thulstrup AM, Nohr EA, Bonde JP, Sørensen TI, Olsen J. Subfecundity in overweight and obese couples. *Hum Reprod.* 2007; 22(6): 1634-7.
 31. Jung AN, Park JH, Kim J, et al. Detrimental effects of higher body mass index and smoking habits on menstrual cycles in Korean Women. *J Women's Health.* 2017;26(1):83-90.
 32. Ibanez L, Ong KK, Lopez-Bermejo A, et al. Hyperinsulinaemic androgen excess in adolescent girls. *Nat Rev Endocrinol.* 2014;10(8): 499-508.
 33. Mcgee WK, Bishop CV, Pohl CR, et al. Effects of hyperandrogenemia and increased adiposity on reproductive and metabolic parameters in young adult female monkeys. *Am J Physiol Endocrinol Metab.* 2014; 306(11):E1292-E1304.