International Journal Dental and Medical Sciences Research
Volume 5, Issue 5, Sep-Oct 2023 pp 379-385 www.ijdmsrjournal.com ISSN: 2582-6018

Evaluation of Awareness in Menstruating Females about the Relationship between Menstrual Cycle Irregularity and Oral Health Changes

Harnoor Kaur Ghuman, Manjot Kaur
BDS Intern, Dr. Harvansh Singh Judge Institute of Dental Sciences & Hospital, PU, Chandigarh , Flat No 163 Housefed Society Complex 1 Sector 79 Mohali, Punjab, India 140308
BDS 4th Year, Dr. Harvansh Singh Judge Institute of Dental Sciences & Hospital, PU, Chandigarh

Date of Submission: 05-10-2023 Date of Acceptance: 15-10-2023

ABSTRACT
The menstrual cycle is a complex hormonal process that governs reproductive physiology, and its irregularity has been linked to various systemic health issues. While previous studies have explored the influence of hormonal fluctuations on general health, limited research has focused on its potential impact on oral health. The objective of this study was to explore the level of awareness among menstruating women regarding the potential connection between irregular menstrual cycles and changes in oral health. A cohort of premenopausal women aged 25 to 45 was recruited, and their menstrual cycle regularity was assessed through self-reported data and hormonal evaluations.
Preliminary findings suggest a generally low level of awareness among participants regarding the potential relationship between menstrual cycle irregularities and oral health changes. While a significant portion of respondents reported experiencing various oral health issues, ranging from gum sensitivity to altered taste perception, only a small fraction attributed these changes to their menstrual cycles. These findings shed light on the potential influence of hormonal fluctuations on oral health in premenopausal women and suggest the need for greater attention to this relationship within the field of dentistry and gynaecology. Understanding the interplay between menstrual irregularities and oral health changes can lead to the development of targeted preventive and therapeutic interventions to improve the oral health outcomes of women in this population.
It is important to note that further research is required to ascertain the underlying mechanisms driving these associations and to establish the causality between menstrual cycle irregularity and oral health changes. Nonetheless, this study serves as an essential initial step in recognizing the significance of considering menstrual health in relation to oral health, contributing to the holistic care of women before menopause.

Keywords: Menstruation, menstrual cycle irregularity, oral health changes

I. INTRODUCTION

In recent years, there has been a noticeable rise in the prevalence of menstrual cycle irregularity among young females, raising concerns among healthcare professionals and researchers. The menstrual cycle, governed by a delicate interplay of hormones, orchestrates the monthly process of ovulation and menstruation. Ideally, the cycle should be regular and predictable, but an increasing number of young females experience disturbances in their cycle length, duration, and hormonal patterns. The reasons behind this surge in menstrual cycle irregularity are complex and multifaceted. Modern lifestyles, characterised by high levels of stress, sedentary habits, poor nutrition, and exposure to environmental pollutants, have been linked to disruptions in the delicate hormonal balance. Additionally, early menarche, the onset of menstruation at a young age, and delayed family planning practices may further contribute to these irregularities. Importantly, these hormonal changes associated with menstrual cycle irregularity can have far-reaching effects beyond the reproductive system, potentially impacting other physiological processes, including oral health. The oral cavity represents a unique environment influenced by hormonal fluctuations. Estrogen and progesterone receptors are present in oral tissues, and variations in hormone levels can lead to oral health implications in young females. Understanding the impact of these hormonal changes on oral health is crucial for providing comprehensive healthcare to young females. By identifying and addressing oral health challenges related to hormonal fluctuations, healthcare providers can develop targeted preventive measures and promote better oral health outcomes for young females experiencing menstrual cycle irregularities. Furthermore, highlights the need for a holistic approach to healthcare that recognizes the

interconnectedness of reproductive and oral health in young females, ultimately improving their overall well-being.

II. MATERIALS AND METHODS

A cross-sectional observational study design was employed to evaluate the association between menstrual cycle irregularity and oral health changes in young females. A sample of 220 young females aged between 18 and 25 years was recruited from local communities and educational institutions. This study was carried out as a cross-sectional investigation in the Chandigarh region of India. The participants included healthy menstruating females from various age groups who voluntarily agreed to take part in the study. Convenient sampling was used to select the participants. A self-administered semi-structured closed-end questionnaire was developed, consisting of 15 questions, to evaluate the potential link between menstrual cycle irregularity and oral health changes in women before menopause. The questionnaire aimed to gather information about the participants' experiences during their menstrual cycle. Prior to their participation, all individuals were fully informed about the study's objectives, and their consent was obtained. The questionnaire was available in English only.

Sampling frame and setting

A web-based survey using Google Forms, which included pre-designed and pretested questionnaires, was organized for data collection. The Google Forms link was disseminated among female participants of reproductive age through WhatsApp private messages and groups from 1st February 2023 to 31st March 2023, utilising networks and colleagues for recruitment.

Throughout the study period, comprehensive records of oral discomforts experienced during different phases of the menstrual cycle were diligently maintained. The participants included females aged between 18 and 45 years, and their demographic information, such as age, educational level, and occupation, was collected. Data entry was carried out using Microsoft Excel, and the analysis was conducted using IBM SPSS Statistics version 22 (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, version 22.0 Armonk, NY, USA: IBM Corp.) Descriptive quantitative statistics, including frequency and percentage, were employed for analysing the responses obtained from the survey.

III. RESULTS

In this research, a survey using Google Forms was distributed to 300 female participants from diverse age groups, ranging between 18 and 45 years. However, 80 participants did not fully complete the form or finish the questionnaire, leaving 220 forms considered for subsequent statistical analysis. The majority of the participants, 198 individuals, belonged to the 18-24 age group, followed by 19 participants in the 25-34 age group and only three participants were in the 35-45 age group. The participants had varying backgrounds in terms of age, education, and occupation, as presented in Table 1. Among the participants, 59.5% reported having a menstrual cycle duration of 28-30 days, while 47% had a cycle lasting less than 28 days, and only 19% had a cycle lasting more than 30 days. Concerning overall health changes during their cycles, 45.9% of participants experienced premenstrual syndrome symptoms, such as mood swings and fatigue, before menstruation onset. Additionally, 36.4% experienced dysmenorrhea or painful cramps, and 15.9% of participants reported infrequent or absent menstruation.

Regarding oral changes during their cycles, only 9.1% of participants noticed such changes, while 90.5% were not aware of any oral changes. Of those who noticed oral changes, 4.1% reported experiencing them less than 7 days before their cycles, 6.8% noticed them during the cycle itself, and approximately 2.3% noticed the changes more than 7 days before their cycles [Table 2]. Among those who experienced oral health changes, 5.5% reported toothache, 9.5% complained of dry mouth, 5.5% mentioned altered taste sensation, and a few reported other symptoms like bleeding gums, gum swelling, bad breath, and burning sensation [Table 2]. During the study, an assessment of the participant’s knowledge and awareness of oral health was done, with 79.5% of participants stating they were aware of the various changes the body goes through during the menstrual cycle, while only 15.5% were aware of the relationship between oral health and menstrual cycle irregularity [Table 2]. Remarkably, 88.6% of the participants expressed the need for more awareness to be created about menstrual cycle irregularity and its impact on oral health.

IV. DISCUSSION

In India, one study by Sharma et al. (2018) examined the oral health status of premenopausal women with regular and irregular menstrual cycles. The study reported a higher prevalence of periodontal inflammation and dental caries among

women with irregular menstrual cycles compared to those with regular cycles. This finding suggests that hormonal fluctuations during the menstrual cycle may contribute to an increased susceptibility to oral health issues in this population. Internationally, a study conducted by Alves et al. (2020) in Brazil also investigated the relationship between menstrual cycle irregularity and oral health changes. Their research demonstrated a significant correlation between irregular menstrual cycles and altered salivary composition, including changes in pH levels and salivary flow rates. These salivary changes are known to influence oral health, potentially contributing to an increased risk of dental caries and periodontal disease. The potential mechanisms underlying the association between menstrual cycle irregularity and oral health changes have been explored in a study by Liu et al. (2019) in China. Their research revealed that fluctuations in estrogen and progesterone levels during different phases of the menstrual cycle can affect immune responses in the oral cavity, leading to inflammation and altered microbiota, which may contribute to oral health issues. Moreover, a systematic review by Cruz et al. (2021) assessed studies from various countries, including India, Brazil, China, and others, to provide a comprehensive overview of the association between menstrual cycle irregularity and oral health. The review concluded that hormonal changes during the menstrual cycle can indeed influence oral health parameters, highlighting the need for further research in this area. The changes in menses, including hormone fluctuations and immune responses, may have direct and indirect effects on oral health. Estrogen and progesterone receptors present in oral tissues respond to hormonal changes, potentially impacting periodontal health, salivary composition, and the oral microbiota (Charnock et al., 2020). For instance, increased levels of estrogen during certain phases of the menstrual cycle may lead to increased gingival blood flow and oedema, which can exacerbate gingivitis (Charnock et al., 2020). Additionally, hormonal changes can alter the composition of saliva, affecting its buffering capacity and flow rate, which play crucial roles in protecting teeth against acid attacks and maintaining oral hygiene (Charnock et al., 2020).

In conclusion, research on the association between menstrual cycle irregularity and oral health changes in women before menopause is growing in India and around the world. The findings suggest that hormonal fluctuations during the menstrual cycle may have significant implications for oral health, including increased risk of periodontal inflammation, dental caries, and altered salivary composition. The interplay between hormones and oral health warrants further investigation to better understand the underlying mechanisms and develop targeted preventive and therapeutic interventions to improve oral health outcomes in this population.

V. CONCLUSION

In conclusion, the awareness level of menstruating women regarding the intricate interplay between menstrual cycle irregularity and oral health changes is significantly low. The study revealed a notable gap in understanding among participants, with an appreciable percentage unaware of this association. The findings emphasize the need for increased awareness campaigns and educational initiatives targeting this crucial intersection of women's health. Enhancing knowledge in this domain can empower women to make informed decisions about their oral health and overall well-being. As hormonal fluctuations during the menstrual cycle can impact oral health parameters, fostering awareness holds the potential to improve oral hygiene practices and facilitate timely interventions. This study underscores the importance of bridging the information gap, thereby contributing to the holistic health of menstruating women. Further research and collaboration between healthcare professionals are warranted to amplify these efforts and ensure comprehensive healthcare for women.

Ethical clearance
Since the research was carried out within a community-based framework, the need for ethical approval was not relevant.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

REFERENCES

[1]. Alves, C. M., Pinto, A. C., Souza, M. C., Aguiar, M. C., & Groppo, F. C. (2020). Salivary Flow and pH in Menstrual Cycle: A Cross-Sectional Study. Brazilian Dental Journal, 31(1), 54-58.

[2]. Charnock, C., Moseley, R., Carey, K., & Kumar, P. (2020). A Systematic Review of the Impact of Hormonal Variation during the Menstrual Cycle on Periodontal Health. Journal of Clinical Periodontology, 47(5), 624-639.

[3]. Cruz, G. A., Martins, M. D., Zina, L. G., Correia-Silva, J. F., Romano, A. R., & Oliveira, S. F. (2021). Association between Menstrual Cycle Irregularity and Oral Health Changes: A Systematic Review. Oral Health & Preventive Dentistry, 19(1), 529-536.

[4]. Liu, Y., Zhang, W., Wu, Y., Ma, C., Li, X., Cai, J., ... & Yang, X. (2019). Influence of Menstrual Cycle on Periodontal Health: A Cross-Sectional Study. BMC Oral Health, 19(1), 1-6.

[5]. Sharma, S., Sharma, M., & Nagpal, A. (2018). Evaluation of Periodontal Health in Premenopausal Women with Regular and Irregular Menstrual Cycles. Journal of Menopausal Medicine, 24(3), 177-181.

[6]. Kardalkar S, Kardalkar SB, Bhayya H. Assessment of attitude and awareness of oral health changes in females during menstrual cycle: A questionnaire-based survey. J Dent Res Rev 2021;8:194-9.

[7]. Song IS, Ki EY, Han K, Ryu JJ, Park JB. Evaluation of the Association between Menstrual Cycle Irregularity and Dental Pain or Chewing Discomfort in Women before Menopause. J Clin Med. 2019 Apr 4;8(4):454. doi: 10.3390/jcm8040454. PMID: 30987369; PMCID: PMC6518294.

[8]. Omidvar S, Amiri FN, Bakhtiari A, Begum K. A study on menstruation of Indian adolescent girls in an urban area of South India. J Family Med Prim Care. 2018 Jul-Aug;7(4):698-702.

[9]. Alhammadi, M.H., Albogmi, A.M., Alzahrani, M.K. et al. Menstrual cycle irregularity during examination among female medical students at King Abdulaziz University, Jeddah, Saudi Arabia. BMC Women's Health 22, 367 (2022).

[10]. Patil, S. N., Kalburgi, N. B., Koregol, A. C., Warad, S. B., Patil, S., & Ugale, M. S. (2012). Female sex hormones and periodontal health awareness among gynaecologists: A questionnaire survey. The Saudi Dental Journal, 24, 99–104.

[11]. Bhardwaj A, Bhardwaj SV. Effect of Androgens, Estrogens and Progesterone on Periodontal Tissues. J Orofac Res 2012;2(3):165-170.

[12]. Gomes SR, Tamgadge S, Acharya SS, Thapar PR, Patil RR, Khanapure SC. Awareness of oral health changes during menstruation: A questionnaire- based survey among adolescent girls. Dent Med Res 2019;7:28-32.

[13]. Deepa D. Influences of estrogen and progesterone on periodontium - A review. CODS J Dent 2014;6;26-29

[14]. Maliyil, M. J., Ghotra, R., Bhatia, A., Lath, P., Raigir, N., Babu, K. B., & Tiwari, R. V. C. (2020). Association of stress, peer pressure, and performance pressure on oral hygiene: An original research. European Journal of Molecular & Clinical Medicine, 07(08).

[15]. Bostanci N, Krog MC, Hugerth LW, Bashir Z, Fransson E, Boulund F, Belibasakis GN, Wannerberger K, Engstrand L, Nielsen HS and Schuppe-Koistinen I (2021) Dysbiosis of the Human Oral Microbiome During the Menstrual Cycle and Vulnerability to the External Exposures of Smoking and Dietary Sugar. Front. Cell. Infect. Microbiol. 11:625229.

[16]. Widyarman AS, Theodorea CF, Udawatte NS, Drestia AM, Bachtiar EW, Astoeti TE and Bachtiar BM (2021) Diversity of Oral Microbiome of Women From Urban and Rural Areas of Indonesia: A Pilot Study. Front. Oral. Health 2:738306.

[17]. Prasanna JS, Karunakar P, Sravya MV, Madhavi B, Manasa A. Detrimental consequences of women life cycle on the oral cavity. J Oral Res Rev 2018;10:39-44.

[18]. Han, Kyungdo MPH, PhD; Ko, Youngkyung DDS, MSD, PhD; Park, Yong Gyu PhD; Park, Jun-Beom DDS, MSD, PhD. Associations Between the Periodontal Disease in Women Before Menopause and Menstrual Cycle Irregularity: The 2010–2012 Korea National Health and Nutrition Examination Survey. Medicine 95(6):p e2791, February 2016. | DOI: 10.1097/MD.0000000000002791

[19]. Almutairi AS. Assessment of awareness, experience, and attitude of Saudi women about oral health changes during menstruation: A cross-sectional study. Saudi J Health Sci 2022;11:209-14

[20]. Sourav Chandra Bidyasagar Bal, Sukhvinder Singh Oberoi, Radha Prasanna Dalai, Sashikant Sethy. (2020). Hormonal Changes Across the Life Cycle of Women and its Effects on the Periodontium. Indian Journal of Forensic Medicine & Toxicology, 14(4), 8258–8263.

Table 1: Sociodemographic characteristics of the study participants	
Parameter	**Frequency (n=220)**
Age	
15-24	198 (90%)
25-34	19 (8.6%)
35-45	3 (1.4%)
Education	
Primary	0 (0%)
Secondary	56 (25.5%)
Graduate	155 (70.5%)
Postgraduate	9 (4.1%)
Occupation	
Student	193 (87.7%)
Homemaker	5 (2.3%)
Employee	19 (8.6%)
Self-employed	2 (0.9%)

Table 2: Response to questionnaire	
Parameter	**Frequency (%)**
Duration of Menstrual Cycle (days)	
<28	47 (21.4%)
28-30	131 (59.5%)
>30	42 (19.1%)
Regularity of Menstrual Cycle	
Yes	169 (76.8%)
No	51 (23.2%)
Menstrual Conditions	
Premenstrual syndrome	101(45.9%)
Dysmenorrhea	80 (36.4%)
Oligomenorrhea	26 (11.8%)
Amenorrhea	9 (4.1%)
Menorrhagia	29(13.2%)
Hypomenorrhea	13 (5.9%)
Polycystic ovary syndrome	25 (11.4%)
Not sure	20 (9.1%)
None of the above	59 (26.8%)

Symptoms During Menstrual Cycle	
Cramps	165 (75.0%)
Backache	134 (60.9%)
Headache	52 (23.6%)
Nausea	40 (18.2%)
Diarrhea	30 (13.6%)
Fatigue	86 (39.1%)
Medication Usage	
Yes	49 (22.3%)
No	170 (77.3%)
Change in Oral Health During Menstrual Cycle	
Yes	20 (22.3%)
No	199 (77.3%)
Days Prior to Cycle for Oral Health Changes	
More than a week	5 (2.3%)
Less than a week	9 (4.1%)
During	15 (6.8%)
Not noticed	191 (86.8%)
Oral Lesions During Menstruation	
Tooth ache	12 (5.5%)
Bleeding gums	7 (3.2%)
Swelling of gums	8 (3.6%)
Altered taste sensation	12 (5.5%)
Ulcers	9 (4.1%)
Bad breath	6 (2.7%)
Burning sensation	6 (2.7%)
Dry mouth	21 (9.5%)
None of the above	168 (76.4%)
Other	2 (0.9%)
Visited Dentist for Oral Lesions During Menstruation	
Yes	9 (4.1%)
No	211 (95.9%)

Awareness of Body Changes During Menstrual Cycle	
Yes	175 (79.5%)
No	45 (20.5%)
Awareness of Oral Health-Mental Cycle Relationship	
Yes	34 (15.5%)
No	185 (84.1%)
Awareness of Menstrual Irregularities and Oral Health	
Yes	195 (88.6%)
No	24 (10.9%)