



## The Influence of Menstrual Cycles on Oral Health: Perspectives from Dental Students in Chennai

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### ABSTRACT

**Background:** This study examines dental students' awareness of how the menstrual cycle affects oral health. Through surveys and discussions, students reflected on their experiences with gum sensitivity, swelling, and increased susceptibility to gingivitis during menstruation. Findings suggest a need for increased emphasis on these issues in dental training to improve patient care. Understanding hormonal influences on oral health can enhance future patient interactions. Integrating menstrual health information in dental education can lead to more effective and empathetic care.

**Methods:** A cross-sectional study was conducted among a representative sample of dental students from diverse academic institutions. A structured questionnaire was administered to assess participants' knowledge, attitudes, and practices concerning patient data privacy and security. Descriptive statistics were used to analyse the data, and associations between demographic factors and awareness-levels were explored.

**Result:** A survey of 330 female dental college students showed most were 18-22 years old. Many had no history of systemic disease medication. Common symptoms during menstruation were cramping, acne, headaches, and food cravings and PMS symptoms included mood swings and irritability. Few discussed oral health concerns related to menstruation with healthcare providers.

**Conclusion:** By recognising menstruation-related oral health changes, dental students gain empathy and improve patient care through gender-specific education, enhancing communication and preventive strategies for better quality care.

**Keywords:** Oral hygiene, menstrual cycle, Premenstrual syndrome (PMS).

### INTRODUCTION

Oral health is a crucial aspect of overall well-being and can be significantly influenced by physiological and hormonal changes throughout a person's life. Among these changes, menstruation plays a notable role in affecting oral health. The menstrual cycle, characterized by fluctuations in hormone levels such as estrogen and progesterone, impacts oral tissues including the periodontium, teeth, and mucous membranes.<sup>1</sup>

During menstruation, individuals may experience alterations in their oral health due to these hormonal shifts. Hormonal changes can lead to gingival inflammation, increased susceptibility to gum disease, and other oral issues. Additionally, menstrual symptoms such as fatigue or discomfort may indirectly affect oral hygiene practices. Understanding the relationship between menstruation and oral health is essential for managing and preventing potential dental problems and maintaining overall oral well-being.<sup>2</sup>

Many studies have shown that the oral mucosa is sensitive to the effects of sex hormones, which impact the oral cavity as their levels change during puberty, pregnancy, various phases of menstruation, and menopause. Hormonal fluctuations during these life stages lead to changes in the gingival and periodontal tissues, which are

crucial to consider during dental treatment planning and progression, especially in periodontics.<sup>1,2,3</sup>

During puberty, elevated levels of sex hormones such as progesterone and estrogen lead to increased blood flow in the gingiva, making it more prone to irritation from food debris, plaque bacteria, and calculus. These hormonal changes can cause existing oral bacteria to multiply rapidly, increasing the risk of gum disease, gingival erosion, and the development of periodontal pockets, which can ultimately progress to periodontitis. Epidemiological and immunological studies indicate that the onset of irreversible tissue damage associated with periodontal disease frequently occurs in late adolescence and early adulthood.<sup>3</sup>

Intraoral changes such as gingival bleeding, redness of the mucosa, oral ulcers, recurrent herpetic lesions, and, rarely, candidal infections can be observed in some women and are attributed to hormonal changes during menstruation. The oral cavity often reflects broader systemic health conditions. Dentists can provide guidance on the changes occurring in the oral cavity and recommend adopting proper hygienic practices during menstruation. In developing and under-developed nations, variations in individual health and access to care can further influence these conditions.<sup>4,5</sup>



Understanding hormonal fluctuations is crucial for dental students to effectively diagnose, manage, and prevent menstrual-related oral health issues. This knowledge enhances their ability to provide patient education, improve outcomes, and support evidence-based care. For female dental students, this study is particularly valuable for self-awareness, helping them empathize with patients, improve personal oral care, and offer informed guidance. Thus, the study aims to assess how dental students perceive oral health changes during menstruation.

**MATERIALS AND METHODS**

A self-structured, closed-ended questionnaire consisting of 17 questions was administered to evaluate awareness of oral health changes during menstruation among female dental undergraduate and postgraduate students at a private dental college in Chennai. Participants were required to be female and at least 18 years old, while those who declined to participate were excluded from the study. Out of 396 eligible female dental students, 330 responses were collected after applying the inclusion and exclusion criteria. The survey was conducted over three months, from February to April 2024. Ethical clearance and necessary permissions were obtained from Dr. MGR Educational and Research Institute, Maduravoyal, Chennai (No.510/2024/IEC/TMDCH) Descriptive statistics were employed to analyse the responses, and SPSS (IBM SPSS Statistics for Windows, version 23.0, Armonk, NY: IBM Corp., Released 2015) was used to compute the frequency and percentage of the variables.

**RESULTS**

A survey of 330 female dental college students was conducted to investigate the relationship between oral health and menstruation. The majority of participants were aged 18-22 (28, 84.8%), followed by 23-27 (45, 13.6%) and 28-36 (5, 1.5%) and the mean age was 20.78±2.32. Most reported no history of medication for systemic diseases (304, 92.1%), while a few were treated for hyperthyroidism (3, (0.9%), hypothyroidism (6, 1.8%), or PCOD/PCOS (12, 3.6%).

Regarding menstrual cycle duration, 4-6 days were reported by 178 (53.9%), 1-3 days by 119 (36.1%), and 7-8 days by 28 (8.5%) of participants. A significant number (103, 31.2%) experienced premenstrual syndrome (PMS) symptoms one week before menstruation, while 6 (1.8%) reported no PMS symptoms.

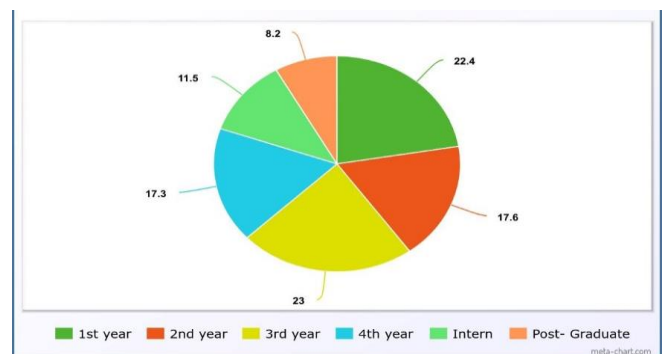
Common physical symptoms associated with PMS included cramping (176, 21.1%), acne (143, 17.1%), headaches (98, 11.7%), and food cravings (94, 11.2%). Other symptoms included fatigue (72, 8.6%), breast tenderness and swelling (63, 7.5%), bloating (61, 7.3%), difficulty sleeping (38, 4.5%), and 24 (2.8%) experienced none of the listed symptoms. A minority (14, 1.6%) reported experiencing all symptoms.

Regarding emotional symptoms, mood swings were reported by 244 (31.8%) of participants, while 156 (20.3%) experienced irritability. However, 98 (12.7%) indicated no emotional symptoms during PMS.

About 36 (10.1%) of participants reported experiencing dry mouth during PMS, and 242 (68.1%) were unaware of any oral changes associated with menstruation. During menstruation, 218 (61.5%) noted no oral changes, while 45 (12.7%) reported hyposalivation, 39 (11.0%) indicated taste alterations, 24 (6.7%) experienced aphthous ulcers, and 15 (4.2%) reported gingivitis. Only 12 (3.6%) experienced halitosis during menstruation.

The menstrual phase was most frequently reported as the phase associated with oral changes, with 169 (51.2%) of respondents indicating this option. The ovulation phase was the second most commonly cited phase, accounting for 77 (23.3%) of responses.

Only 22 (6.7%) had discussed oral health concerns related to menstruation with their dentist or healthcare provider, while 308 (93.3%) had not. Regarding self-rated oral hygiene during menstruation, 84 (25.5%) rated it as good, 58 (17.6%) as fair, and 6 (1.8%) as poor.



**Figure 1:** The year of dental students.

**Table 01:** Demographic details of the study participants

Question	Option	Frequency	Percentage
Year of study of participants	1st Year	74	22.4
	2nd Year	58	17.6
	3rd Year	76	23.0
	4th year	57	17.3
	Intern	38	11.5
	Post-graduate student	27	8.2

History of medication for systemic disease	Hypothyroidism	6	1.8
	Hyperthyroidism	3	0.9
	PCOS/PCOD	12	3.6
	No	304	92.1
	Cyst	1	0.3
	Ovarian cyst	1	0.3
	Diabetics	2	0.6
	Irregular periods	1	0.3

**Table 02:** History of the menstrual cycle among the study participants

Question	Option	Frequency	Percentage
<b>Does your menstruation occur regularly?</b>	Almost always	221	67.0
	Never	7	2.1
	Occasionally	36	10.9
	Seldom	3	.9
	To a considered extent	63	19.1
<b>What is the duration of your menstrual cycle?</b>	1-3 days	119	36.1
	1-5	1	.3
	1-5 days	1	.3
	10	1	.3
	10-11	1	.3
	4-6 days	178	53.9
	7-8 days	28	8.5
	more than 10 days	1	.3
<b>Rate the severity of pain during period cramps?</b>	1.0	40	12.1
	2.0	22	6.7
	3.0	27	8.2
	4.0	31	9.4
	5.0	49	14.8
	6.0	21	6.4
	7.0	33	10.0
	8.0	44	13.3
	9.0	12	3.6
	10.0	51	15.5
<b>Do you experience symptoms of premenstrual syndrome? (PMS)</b>	Yes	163	49.4
	No	87	26.4
	Occasionally	80	24.2
<b>What are the most prominent emotional symptoms that you personally experience during PMS?</b>	Irritability	156	20.3
	Anxiety	91	11.8
	Mood swings	244	31.8
	Depression	85	11.0
	Difficulty in concentrating	68	8.8
	All of the above	98	12.7
	None of the above	25	3.2
<b>Do you tend to crave any specific type of food during PMS? If yes what type of cravings</b>	Sugary treats (cake, cookies, ice cream)	161	30.6
	Starchy carbs (bread, pasta, rice, crackers)	49	9.3
	Salty snacks (chips, fries, popcorn)	57	10.8

	Chocolate (especially dark chocolates)	117	22.2
	Fatty foods (cheese, pizza, burger)	69	13.4
	No cravings	72	13.7
<b>What type of oral changes do you see during PMS?</b>	Gingivitis	11	3.0
	Dry mouth / Hypo - salivation	36	10.1
	Taste alteration	27	7.6
	Apthous ulcer	27	7.6
	Temporo - mandibular joint (TMJ) Syndrome	6	1.6
	Swollen salivary gland	6	1.6
	No changes seen	242	68.1
	<b>How much do you believe that menstruation affect your oral health?</b>	Agree	56
Strongly Agree		10	3.0
Neutral		211	63.9
Disagree		40	12.1
Strongly disagree		13	3.9
<b>In which phase of menstrual cycle changes in oral HealthCare?</b>	Menstruation	169	51.2
	Follicular phase	57	17.3
	Ovulation phase	77	23.3
	Luteal phase	27	8.2
<b>What type of oral changes do you see during menstruation?</b>	Gingivitis	15	4.2
	Dry mouth / Hypo - salivation	45	12.7
	Taste alteration	39	11.0
	Apthous ulcer	24	6.7
	Temporomandibular joint (TMJ) Syndrome	8	2.2
	Swollen salivary gland	5	1.4
	No changes seen	218	61.5
<b>Have you ever experienced halitosis during menstruation?</b>	Yes	12	3.6
	No	260	78.8
	Maybe	58	17.6
<b>Do you take any medications to manage physical and oral changes during menstruation?</b>	Yes	10	3.0
	No	308	93.3
	If yes, mention medicines below	9	2.7
	For pain	1	.3
	Meftal, dolo	1	.3
	Meptholspas, dolo	1	.3

**Table 03:** Knowledge of Premenstrual Syndrome (PMS) among study participants

Question	Option	Frequency	Percentage
<b>Are you aware that PMS is related with oral health changes?</b>	Yes	94	28.5
	No	236	71.5
<b>What time period do PMS symptoms starts?</b>	1 day	1	0.3
	1 day before	1	0.3
	1 or 2 days before menstrual date	1	0.3
	1 to 2 days before	1	0.3
	1 week before menstruation	103	31.2
	2 days	1	0.3

	2 days before	3	0.9
	2 days before menstruation	1	0.3
	2 weeks before menstruation	25	7.6
	2-3 days before	2	0.6
	2days	1	0.3
	3 days before menstruation	1	0.3
	3 to 4 days before menstruation	1	0.3
	5 days before menstruation	97	29.4
	Do not know	84	25.5
	Few hrs before	1	0.3
	No symptoms	6	1.8
<b>What are the most prominent physical symptoms that you personally experience during PMS</b>	Breast tenderness and swelling	63	7.5
	Bloating	61	7.3
	Cramping	176	21.1
	Head ache	98	11.7
	Acne	143	17.1
	Fatigue	72	8.6
	Difficulty sleeping	38	4.5
	Constipation or diarrhoea	51	6.1
	Food craving	94	11.2
	All the above	14	1.6
	None of above	24	2.8

**Table 04:** Awareness about oral health changes during menstruation among study participants

Question	Option	Frequency	Percentage
<b>How much do you believe that menstruation affect your oral health?</b>	Agree	56	17.0
	Strongly Agree	10	3.0
	Neutral	211	63.9
	Disagree	40	12.1
	Strongly disagree	13	3.9
<b>In which phase of menstrual cycle changes in oral HealthCare?</b>	Menstruation	169	51.2
	Follicular phase	57	17.3
	Ovulation phase	77	23.3
	Luteal phase	27	8.2
<b>What type of oral changes do you see during menstruation?</b>	Gingivitis	15	4.2
	Dry mouth / Hypo - salivation	45	12.7
	Taste alteration	39	11.0
	Aphthous ulcer	24	6.7
	Temporomandibular joint (TMJ) Syndrome	8	2.2
	Swollen salivary gland	5	1.4
	No changes seen	218	61.5
<b>Have you ever experienced halitosis during menstruation?</b>	Yes	12	3.6
	No	260	78.8
	Maybe	58	17.6
<b>Do you take any medications to manage physical and oral changes during menstruation?</b>	Yes	10	3.0
	No	308	93.3
	If yes, mention medicines below	9	2.7

	For pain	1	.3
	Meftal, dolo	1	.3
	Meptholspas, dolo	1	.3
<b>Have you ever discussed any oral health concerns related to menstruation with your dentist or health care provider?</b>	yes	22	6.7
	No	308	93.3
<b>How would you rate your overall oral hygiene during menstruation compared to other times of the month?</b>	1.0	13	3.9
	2.0	6	1.8
	3.0	6	1.8
	4.0	11	3.3
	5.0	45	13.6
	6.0	31	9.4
	7.0	30	9.1
	8.0	58	17.6
	9.0	46	13.9
	10.0	84	25.5

## DISCUSSION

A cross-sectional study was conducted to investigate the self-perception of dental students regarding menstruation-related oral health changes. It aims to examine the extent of students' awareness of these impacts, their understanding of the physiological underpinnings, and the influence of this knowledge on their developing clinical perspectives. Insights from this study may encourage a more holistic approach to oral health education, promoting sensitivity to the unique oral health needs of menstruating individuals. Our study found that only 36 (10.1%) of participants were aware of dry mouth during PMS, and 242 (68.1%) were unaware of any oral changes during menstruation, highlighting a significant knowledge gap. This aligns with Gomes et al.'s findings, where only 4% of participants knew about the correlation between oral health and menstruation, emphasizing the need for increased awareness.<sup>6</sup> Amber Kiyani's study also noted weak associations between age groups, salivary flow rate, and oral symptoms, indicating that demographic factors might influence symptom recognition.<sup>7</sup>

Regarding the prevalence of oral changes, our study reported that dry mouth (36, 10.1%), taste alteration (39, 11%), and gingivitis (15, 4.2%) were the most common symptoms, with 218 (61.5%) of participants not experiencing significant oral changes. This contrasts with Kardalkar et al.'s findings, which reported a higher prevalence of oral changes, suggesting potential differences in symptom awareness or sample characteristics.<sup>8</sup> Similarly, Amber Kiyani's study showed a broad spectrum of symptoms, including hyposalivation (29.9%) and taste alterations (25.3%), highlighting the varied impact of menstruation on oral health.<sup>7</sup> In terms of gingival changes, our study found that 15(4.2%) of participants experienced gingivitis, aligning with Balan et al.'s findings, where 8% of participants reported gingival bleeding, indicating that

hormonal changes during menstruation could exacerbate preexisting oral conditions.<sup>9</sup>

Shourie et al. further concluded that while sex hormones could worsen preexisting gingivitis, their impact on a healthy periodontium is minimal, suggesting that menstruation's overall effect on oral health remains uncertain.<sup>10</sup>

Our study also highlighted common PMS symptoms such as cramping (176, 21.1%), acne (143, 17.1%), and mood swings (244, 31.8%), which align with Swetha Kardalkar's findings, where 18.3% of participants experienced oral changes, including aphthous ulcers (15%) and bleeding gums (7.3%), reflecting a broad recognition of oral manifestations during menstruation.<sup>8</sup> The studies also explored oral hygiene practices during menstruation; in the present study, 84 (25.5%) of participants maintained good oral hygiene during menstruation, whereas Swetha Kardalkar reported that 81.3% believed in the efficacy of antimicrobial mouthwash, and 55.7% believed in the benefits of brushing twice daily, indicating a generally higher awareness of preventive measures in their study.<sup>8</sup> This contrast underscores the need to enhance awareness and education about oral hygiene during menstruation across different populations.

On a broader level, the UNICEF report (2014) highlighted that a significant percentage of adolescent women, particularly in states like Tamil Nadu (79%), Uttar Pradesh (66%), and West Bengal (51%), were not aware of menstrual hygiene, reflecting a societal issue that extends to oral health during menstruation.<sup>11</sup> This is further supported by Gomes et al., who emphasized the importance of education programs, government initiatives, and awareness workshops in improving hygiene practices and breaking menstruation taboos.<sup>6</sup>

Collectively, these studies underscore the necessity of integrating oral health education into broader menstrual



health programs. Increasing awareness of the interconnections between menstruation and oral health could enhance symptom recognition, encourage preventive practices, and improve the overall quality of life for women during their reproductive years. There is a clear call for comprehensive health education strategies that address the unique needs of women, particularly in understanding how menstrual cycles can influence their oral and overall health.

## CONCLUSION

This survey of female dental college students suggests that while many do not experience significant oral health changes during menstruation, a significant proportion do report experiencing symptoms of PMS. It is important for dental college students to pay attention to changes in oral health during their menstrual cycle and consult with a dentist or healthcare provider about any concerns. Good oral hygiene, stress management, and understanding the potential impact of hormonal fluctuations are essential for maintaining oral health during menstruation.

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