Original Article

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Prevalence of Gingivitis among the Patients Visiting Dental OPD of Bhitai Dental & Medical College Mirpurkhas

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Author`s Contribution

[1,2]Substantial contributions to the conception or design of the work; or the acquisition, [4,6]Active participation in active methodology, [2,3]analysis, or interpretation of data for the work, [5]Drafting the work or revising it critically for important intellectual content

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ABSTRACT

Objective: To determine the prevalence rate of gingivitis among the patients visiting Dental OPD of Bhittai Dental & Medical College Mirpurkhas.

Methodology: This cross-sectional study was conducted at the dental OPD of Bhittai Dental & Medical College, Mirpurkhas, over six months, from July 2023 to December 2023. All individuals aged over 12 years, of both genders, attending the dental OPD for routine check-ups, dental complaints, or periodontal assessments were included. Each patient underwent a periodontal assessment by a qualified dental professional. The diagnosis of gingivitis was made using standard clinical criteria, including gum redness, swelling, and bleeding on probing. Patients were assessed for gingivitis and its severity using the Gingival Index (GI) to quantify severity. A structured questionnaire was used to record demographic details, oral hygiene practices, and frequency of gingivitis, and the data was analyzed using SPSS version 26.

Results: Mean age of the patients was 28.3 years, with slightly more female (52.2%) than male (47.8%), and the majority were married (69.6%). Gingival bleeding was found in 39.1% of the participants, indicating the presence of inflammation, while 60.9% showed no bleeding. There was an insignificant link between gender and gingival bleeding (p=>0.05), while medication use and poor oral hygiene was significantly associated, with those not on medication experiencing more bleeding (<0.05). Tobacco use did not significantly affect bleeding rates (p=>0.05).

Conclusion: The prevalence of gingivitis among patients visiting the OPD reveal that gingival bleeding is a common clinical sign, affecting approximately 39.1% of participants

Keywords: Gingivitis, Prevalence, Periodontal Disease, Oral Hygiene, Dental OPD, Gum Bleeding, Smoking, Risk Factors

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Introduction

Periodontal conditions are among the widespread, multifactorial, and chronic inflammatory diseases and a serious concern among dental patient and healthcare providers around the world. During 2011-2020, about 62% of adult population was globally experiencing periodontitis, with severe condition experienced by 23.6% of individuals.[1] Severe forms of periodontitis are the major cause of tooth loss in adult population, which in turn leads to impaired mastication, potential malnutrition, and significantly reducing quality of life.[2]

Additionally, factors including escalating global population, fluctuating risk factors, and functional dentition methods would augment the socio-economic consequences of periodontitis, which presently contribute to 3.5 million non-fatal burden, a yearly cost of 54 billion dollars in output, and a loss of 442 billion dollars per annum due to oral diseases. [3]

Gingivitis, a periodontal condition, is the second most prevalent dental pathology. It is characterized by dental plaque-associated inflammatory gums. Clinical presentation of gingivitis includes erythema, bleeding, edema, swelling, redness, and/or pain. Although, it is reversible, but when left intact, may permanently damage the supporting teeth structures, which would eventually cause teeth loss.[4,5]

Gingivitis is clinically significant because it is an initial stage of developing periodontitis, which only develops when gingivitis is chronic. Initially, gingivitis symptoms are unnoticeable, and bleeding on probing (BOP) and gingival redness do not appear unless early lesions develop in gums. It is typically painless and spontaneous bleeding occurs rarely, which makes it difficult to recognize in most of the patients.[6] The recent epidemiological studies involving periodontal diseases classification defined clinically good periodontal health with threshold level of bleeding on probing (BOP) below 10% of periodontal sites along with no gingival inflammation and no attachment loss for connective tissue.[7]

The prevalence of Periodontitis widely varies across countries and published studies based on geographical location, oral hygiene practices, access to dental care, and differences in participants' age, operational definitions, and diagnostic criteria of periodontal condition. Its prevalence ranges from lowest in low-income nations (10-29%) to highest in high-income nations (44%).[8] However, gingivitis is affecting over 1 billion people globally, irrespective of age group.[9,10] The global figures for gingivitis range between70–100 %, with 93.9 % in adult population of American United States and 97.9 % in Chinese adult population.[11]

In Pakistan, a number of studies explored the frequency of gingivitis and associated risk factors and showed the multifactorial nature of nature of gingivitis. Studies from this region suggest that gingivitis is associated with several factors including age (tricenarians), gender, educational status, marital status, income level, and oral hygiene practices.[12,13] furthermore, studies suggest that growing age, low levels of hemoglobin and poor oral health further deteriorating this condition.[14] It is therefore important to consider demographic variables, oral hygiene practices, and awareness when assessing for and managing gingivitis. According to the gingivitis as a highly prevalent oral health condition that, if left untreated, can progress to more severe periodontal diseases, ultimately compromising oral function and overall quality of life of individuals. Regardless of its widespread occurrence, there is limited region-specific data available, particularly in underserved areas, hence addressing the local prevalence and burden of gingivitis is very important for developing targeted preventive and treatment strategies. Therefore, this study is aimed to assess the prevalence of gingivitis among patients attending the dental outpatient department of Bhitai Dental & Medical College, Mirpurkhas. Findings of the study may provide valuable insights for clinicians and public health policymakers to improve periodontal healthcare services and reduce disease progression our local population.

Methodology

This cross-sectional study was conducted at the dental OPD of Bhittai Dental & Medical College, Mirpurkhas, over six months, from July 2023 to December 2023. All individuals aged over 12 years, of both genders, attending the dental OPD for routine check-ups, dental complaints, or periodontal assessments were included. All the patients with history of systemic conditions known to affect periodontal health such as diabetes mellitus, cardiovascular disease, or immunocompromising conditions, were on medications associated with gingival changes, or had undergone periodontal treatment within the past six months and those were unwilling to participate in the study were excluded. A verbal informed consent was obtained from each participant and the purpose of the study was clearly explained, emphasizing that the research aimed to assess the prevalence of gingivitis. Participants were assured that their involvement was voluntary, their decision to participate or decline would not affect their clinical care, and that all personal data would be kept confidential and used solely for the purposes of research. Each patient underwent a periodontal assessment by a qualified dental professional. The diagnosis of gingivitis was made using standard clinical criteria, including gum redness, swelling, and bleeding on probing. A structured questionnaire was used to record demographic details, oral hygiene practices, and

frequency of gingivitis, and the data was analyzed using SPSS version 26.

Results

Present study included the 69 participants with an average age of 28.3 years, with slightly more female (52.2%) than male (47.8%), and the majority were married (69.6%). Majority were housewives (43.5%), followed by students (17.4%) and individuals with their own businesses (13.0%). In terms of residence, the majority lived in urban areas (60.9%). Based oral heal and hygiene status, the 30.4% of participants rated their oral health as poor, while 26.1% rated it as average, indicating that over half of respondents perceive their dental health as suboptimal. Additionally, 47.8% cases good oral hygiene and 30.4% had very good, showing better self-reported hygiene than health. Based on symptoms, 39.1% reported bleeding gums sometimes during brushing, and 17.4% experienced pain or sensitivity often after brushing. Around 52.2% had not visited a dentist in the past year, though 52.2% reported having scaling or deep cleaning. Daily oral hygiene was common, with 43.5% brushing once a day and 26.1% brushing twice or more. Most of the cases (73.9%) were using a toothbrush, while 13.0% used dental floss, only 8.7% reported having gums diseases, and 21.7% were tobacco users. (Table I)

Table I: Oral Health and Hygiene status among study participants, (n=69)

Questionnaire		Frequency	%
Q2. How would you rate the health of your teeth & gums?	Excellent	15	21.7
	Very good	9	13.0
	Average	18	26.1
	Poor	21	30.4
	Very poor	3	4.3
	Don't know	3	4.3
Q3. How would you rate your oral Hygiene?	Very good	21	30.4
	Good	33	47.8
	Regular	12	17.4
	Bed	3	4.3
Q4. Do you feel pain or sensitivity in your gums after brushing your teeth?	Often	12	17.4
	Sometime	27	39.1
	Never	30	43.5
Q5. During tooth brushing, do your gums bleed?	Often	3	4.3
	Sometime	27	39.1
	Never	39	56.5
Q6. In the last month, have you felt your gums reddish or swollen?	Always	6	8.7
	Often	12	17.4
	Sometime	15	21.7
	Never	36	52.2
Q7. Do you think your teeth are unaligned or crooked?	Yes	30	43.5
	No	36	52.2
	Don't know	3	4.3
Q8. Have you visited your Dentist during the last year?	Yes	33	47.8
	No	36	52.2
Q10. During your dentist appointment, have you had dental scaling or deep cleaning?	Yes	36	52.2
	No	30	43.5
Q11. How often do you clean your teeth?	Never	3	4.3
	Several times a month	12	17.4
	Once a week	3	4.3
	Several times a week	3	4.3
	Once a day	30	43.5
	2 or more times a day	18	26.1
Q12. Do you use any of the following to clean your teeth or gum?	Tooth brush	51	73.9
	Wooden tooth picks	6	8.7
	Threads (dental floss)	9	13.0
	Chew stick	3	4.3
Q13. Did you ever had or do you have, a problem related disease or condition?	Yes	6	8.7
	No	57	82.6
Q14. Are you currently taking any other medicine?	Yes	24	34.8
	No	45	65.2
Q15. How often do you use any of the following types of tobacco?	No	51	73.9
	Smoking only	15	21.7
	smoking, chew tobacco or snuff, pan betal nut	3	4.3

Gingival bleeding was found in 39.1% of the participants, indicating the presence of inflammation, while 60.9% showed no bleeding. According to the periodontal status, 30.4% of individuals had increased pocket depth (4–5 mm), which is associated with gingivitis and early periodontitis, whereas 69.6% had normal pocket depth (1–3 mm), suggesting healthy gums. These findings suggest that a considerable proportion of the population showed clinical signs of gingivitis. (Table II)

Table II: Frequency of gingival bleeding and pocket depth. (n=69)

Variables	N	%
Gingival bleeding		
Absence of condition	42	60.9
Presence of condition	27	39.1
Total	69	100.0
Pocket depth		
Pocket depth 1-3 mm (Absence of condition)	48	69.6
Pocket depth 4-5 mm (presence of condition)	21	30.4
Total	69	100.0

Additionally, analysis showed insignificant link between gender and gingival bleeding (p=>0.05), while medication use and poor oral hygiene was significantly associated, with those not on medication experiencing

more bleeding (<0.05). Tobacco use did not significantly affect bleeding rates (p=>0.05). (Table III)

Table III: Frequency of gingival bleeding according to gender, oral hygiene, medicine and tobacco uses .(n=69)

VARIABLES		Gingival bleeding		Total	p-value
		Yes	No		
Gender	Male	21	12	33	0.652
		30.4%	17.4%	47.8%	
	Female	21	15	36	
		30.4%	21.7%	52.2%	
How would you rate your oral Hygiene?	Very good	15	6	21	0.255
		21.7%	8.7%	30.4%	
	Good	18	15	33	
		26.1%	21.7%	47.8%	
	Regular	6	6	12	
		8.7%	8.7%	17.4%	
	Poor	3	0	3	
		4.3%	0.0%	4.3%	
Are you currently taking any other medicine?	No	33	12	45	0.001
		47.8%	17.4%	65.2%	
	Yes	9	15	24	
		13.0%	21.7%	34.8%	
How often do you use any of the following types of tobacco?	No	33	18	51	0.083
		47.8%	26.1%	73.9%	
	Smoking only	6	9	15	
		8.7%	13.0%	21.7%	
	Smoking chew tobacco or snuff, pan betal nut	3	0	3	
		4.3%	0.0%	4.3%	

Discussion

Periodontal conditions, including periodontitis and plaque-provoked gingivitis, are the chronic diseases attributed to inflammatory processes that mainly affect the supporting dental tissues.[15] Untreated gingivitis may develop into periodontitis, a serious condition, which deteriorates the supporting dental structures (such as alveolar bone, gums, and periodontal ligament) or Clinical attachment loss. The severity, extant, and progression of periodontal condition is influenced by genetic and host-related environmental factors. Despite being preventable and treatable, gingivitis is highly prevalent.[16] Present study assessed the prevalence of gingivitis among 69 patients visiting the dental OPD with an overall mean age of 28.3 years, with a predominance of females (52.2%), married individuals (69.6%), housewives (43.5%), and urban residents (60.9%). Additionally, 21.7% of the participants reported tobacco use. These findings are consistent with those of Mostafa and El-Refai et al[17] who reported a similar mean age of 29.56 years and a slightly higher proportion of female participants (56.71%). Similarly, a study by Seong et al[18] also documented partially comparable demographic characteristics, noting a female majority, with most participants residing in small towns, followed by metropolitan and rural areas, and a higher proportion of students. These comparisons support the reliability and relevance of the current study's findings. The demographic distribution highlights the importance of targeting young, urban, and predominantly female populations in gingivitis prevention and awareness programs.

The present study revealed that 30.4% of participants rated their oral health as poor and 26.1% as average, indicating that over half perceive their dental health as suboptimal. In contrast, self-reported oral hygiene was somewhat better: 47.8% described it as good and 30.4% as very good. Daily oral hygiene practices were common, with 43.5% brushing once and 26.1% brushing twice or more per day; 73.9% used a toothbrush, 13.0% used dental floss, and 52.2% had not visited a dentist in the past year despite 52.2% reporting having undergone scaling or deep cleaning. These findings align closely with Olusile et al[19] cohort, in which 21.2% rated their oral health as very good, 37.1% as good, and 27.4% as fair; 81% used a toothbrush and toothpaste, 10.5% used dental floss, and only 26.4% had a dental visit in the preceding year, primarily for treatment purposes. Consistently, Sreenivasan et al[20] found that 97% of subjects used a toothbrush and toothpaste, 53–54% brushed once daily, only 1% used floss, and 73% had not seen a dentist in the past five years. Above comparisons underscore a global pattern in which self-perceived oral hygiene often exceeds self-perceived oral health, and highlight the persistent gap in preventive dental visits, justifying targeted education and access initiatives.

In the present study, 39.1% of participants reported experiencing bleeding gums occasionally during brushing, while 17.4% experienced pain or sensitivity often after brushing, and only 8.7% self-reported having gum disease. These symptom-based findings suggest that many individuals may underestimate or remain unaware of underlying gingival issues. Comparable results were observed in a study by Veynachter et al[21] where 58.7% of participants reported bleeding following toothbrushing and 4.5% experienced bleeding even without brushing. They also noted higher rates of gum bleeding among males and younger individuals. Similarly, Wong et al[22] reported bleeding gums in 62.2% of subjects, with 45.8% experiencing tooth sensitivity and 30.7% reporting swollen or painful gums, although only 17.7% self-reported having periodontitis. In the present study, the

observed gingival bleeding in 39.1% of participants indicates the presence of gingival inflammation and suggests a considerable burden of gingivitis. However, this prevalence is significantly lower than figures reported in other regions—for instance, Osuh et al[23] from Nigeria reported 82.2%, and Chairunisa et al[24] from Indonesia reported 74.1%. Conversely, Li et al[25] documented a notably lower prevalence of gingival bleeding (6.1%). The some differences across the studies may be attributed to variations in oral hygiene practices, awareness levels, healthcare accessibility, and study methodologies across populations.

In this study, 30.4% of participants exhibited increased pocket depth (4–5 mm), indicative of gingivitis or early periodontitis, while 69.6% had normal pocket depth (1–3 mm), reflecting overall healthy gums. These findings suggest that a notable portion of the population shows early clinical signs of periodontal disease. Comparable results were reported by Chikte et al[26] who observed 4–5 mm pocket depths in 50% of their participants and deep pockets in 43.3%, indicating a more severe periodontal burden in their population. In contrast, Ababneh et al[27] found that a considerable proportion of patients—ranging from 26.6% in those under 20 to 37% in those over 50 had pocket depths of 3 mm or more, further supporting age-related progression of periodontal disease.

In this study, medication use was significantly associated with poor oral hygiene and a higher frequency of gingival bleeding ($p < 0.05$), whereas gender and tobacco use showed no significant association with bleeding frequency ($p > 0.05$). These findings are consistent with a retrospective study by Chatzopoulos et al[28] which also found a significant association between systemic medication use and periodontitis, while gender and tobacco use were not linked to the disease. However, contrasting results were reported in a systematic review by Leite et al[29]which identified tobacco consumption as a major risk factor, increasing the likelihood of periodontitis by 85%. The differing of studies highlighting the complex interplay of risk factors in periodontal disease and suggest that population-specific variables may influence associations. Due to the several limitations of the present study including small sample size and single-center design, reliance on self-reported data and not specifically concern for risk factors may affect the generalizability of the results. Hence, further studies should involve larger, multi-center samples and longitudinal designs to explore causal relationships, while incorporating advanced diagnostics and broader public health strategies to enhance gingivitis prevention and management.

Conclusion

This study concluded that the prevalence of gingivitis among patients visiting the dental OPD reveals that gingival bleeding as common clinical sign, affecting approximately 39.1% of participants. Additionally, the use of medication and poor oral hygiene was significantly associated with gingival bleeding, as non-medicated individuals had higher rates of bleeding, while tobacco use did not show a significant effect. However, further large scale research is recommended to validate these findings and explore the impact of risk factors more thoroughly.

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