

Prevalence of bleeding on probing among patients at the periodontology clinic of Universitas Airlangga Dental Hospital

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World Journal of Advanced Research and Reviews, 2024, 21(02), 618–622

Publication history: Received on 28 December 2023; revised on 31 January 2024; accepted on 02 February 2024

Article DOI: <https://doi.org/10.30574/wjarr.2024.21.2.0372>

Abstract

Background: Periodontal disease is a prevalent global oral health concern, impacting tooth loss in adults. This study investigates the prevalence of bleeding on probing (BOP) and its correlation with various factors.

Objectives: To determine prevalence of bleeding on probing among patients at the periodontology clinic of Universitas Airlangga dental hospital.

Material and Methods: Utilizing a cross-sectional observational design, the research analyzes data from the Periodontology Clinic of RSGM Universitas Airlangga. Sample size calculation involves total sampling from 2022 patient records meeting specific criteria. The study explores BOP, gender, age, and tooth region variables, with data processed in Microsoft Excel and analyzed descriptively.

Conclusion: The majority of patients at Airlangga University's Dental Hospital experience BOP >10%. The highest percentage of BOP >10% is found in males, and the most prevalent age group is 35 to ≥65 years. Sextants 1 and 6 (posterior) show the highest incidence of BOP, with 81 occurrences.

Keywords: Bleeding on probing; Periodontal disease; Prevalence; Age; Gender; Sextant

1. Introduction

Periodontal disease is a common oral health issue worldwide, including in Indonesia, and stands as a primary cause of tooth loss in the adult population. The global prevalence of periodontal disease ranges from 20% to 50%. In Indonesia, according to the 2018 Riskesdas data, 67.8% of individuals aged 15 and above suffer from periodontal disease. The disease manifests in two main forms: gingivitis and periodontitis. Without intervention, it can lead to damage to the supporting structures of teeth, such as alveolar bone and periodontal ligaments, ultimately resulting in tooth loss [1].

Bleeding on probing (BOP) serves as a crucial parameter for assessing inflammation in periodontal tissues. BOP is an early sign of gingivitis and can be measured using a periodontal probe. Areas with BOP may experience clinical attachment loss, indicating inflammation. The detected BOP in stage I (initial gingivitis) also serves as a crucial indicator in identifying bleeding during probing. In this phase, erythema occurs on the gingiva [2]. The bleeding index is also an indicator of periodontal health, closely related to clinical attachment loss, and signifies active inflammatory processes.

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This study utilizes secondary data from the medical records of patients at the Periodontology Clinic of RSGM Universitas Airlangga, focusing on the Bleeding on Probing (BOP) indicator to depict the prevalence of periodontal conditions in that setting.

2. Material and methods

This study was conducted from August 2023 until September 2023 at the Dental Hospital Airlangga University. This research employs an observational descriptive method with a cross-sectional design. Sample size calculation is conducted through total sampling using secondary data extracted from the medical records of patients at the Periodontology Clinic of RSGM Universitas Airlangga, meeting the inclusion criteria of patients who visited in the year 2022, completed periodontal medical records, and records signed by the Doctor in Charge of Service (DPJP). The research variables include bleeding on probing (BOP), gender, age, and tooth region (sextant). Data processing utilizes Microsoft Excel and is presented in percentage (%). Descriptive data analysis is performed, followed by drawing conclusions.

3. Results and discussion

In the 2022 study at RSGM Universitas Airlangga, 1573 visits were initially recorded at the Periodontology Clinic. After data processing, the total reduced to 716 patients, with 114 new visits and 602 returning visits. Following the sorting of records, 149 cases with complete periodontal supplements were identified. Subsequent data accumulation and exclusions in Microsoft Excel yielded 97 inclusion samples—22 from new visits and 75 from returning visits—after excluding records with missing information, incomplete supplements, data from years other than 2022, individuals under 18 years old, and those with fewer than 20 teeth.

3.1. Prevalence of Bleeding on Probing Based on Individual Factors

In the advanced data processing to ascertain the presence of bleeding on probing (BOP), categorizing the number of teeth experiencing BOP <10% serves as an indication of disturbed periodontal tissue with a high risk of periodontal damage occurrence [3].

Table 1 The prevalence of bleeding on probing on individual factors.

Criteria	Visit Data	
	Total Data Frequency	Percentage (%)
<10%	8	8.24
>10%	89	91.76

Among all inclusion samples, 8 samples (8.25%) exhibited bleeding on probing criteria <10%, while 89 samples (91.75%) exhibited bleeding on probing criteria >10%. These results indicate that the majority of patients show signs of damage to periodontal tissues, one of which is bleeding on probing. In this data categorization, patients with bleeding percentages <10% are considered at low risk of experiencing periodontal disease, whereas those with bleeding percentages >10% are considered at high risk of experiencing periodontal disease [3].

3.2. Prevalence of Bleeding on Probing Based on Age Range

In the prevalence of bleeding on probing (BOP) based on age ranges classified according to the 2018 Riskesdas, a total of 97 inclusion samples are presented in the table below [1].

Table 2 The Prevalence of Bleeding on Probing Based on Age Range

Age (year)	Criteria				Total Patients Based on Age Range	Percentage (%) > 10% Based on Each Age Range
	<10%	Percentage (%)	>10%	Percentage (%)		
18-24	4	4.12	30	30.93	34	88.24
25-34	4	4.12	17	17.53	21	80.95
35-44	-	-	20	20.62	20	100
45-54	-	-	14	14.43	14	100
55-64	-	-	7	7.22	7	100
≥65	-	-	1	1.03	1	100
Total	8	8.24	89	91.76	97	

Research findings indicate that the bleeding on probing (BOP) rate <10% is more prevalent within the age groups of 35-44, 45-54, 54-64, and ≥65 years. These findings align with a 2021 study noting a high distribution of BOP >10% in the same age groups [4]. In the 35-44 age group, a significant BOP level is observed, possibly related to social pressure and life stress. For those aged 45-54, hormonal changes during perimenopause and increased stress may impact periodontal health [5]. In the 54-64 age group, the potential for reduced oral hygiene increases due to declining dexterity and reduced time for oral care. Lastly, in the ≥65 age group, the impact of aging on periodontal tissue health becomes a major contributor to the high BOP rate, indicating an escalating potential for periodontal tissue damage with advancing age [6].

3.3. Prevalence of Bleeding on Probing Based on Gender

In the prevalence of bleeding on probing (BOP) based on gender, a total of 97 inclusion samples are available, as shown in the table below.

Table 3 The Prevalence of Bleeding on Probing Based on Gender

Gender	Criteria					Percentage (%) >10% Based on Gender
	<10%	Percentage (%)	>10%	Percentage (%)	Total	
Laki- Laki	3	3.09	37	38.14	40	92.5
Perempuan	5	5.16	52	53.61	57	91.23
Total	8	8.25	89	91.75	97	

The analysis of the relationship between gender and the occurrence of bleeding on probing (BOP) based on the total individuals indicates a higher percentage of BOP in males (92.5%) compared to females (91.23%). This suggests a higher prevalence of BOP in males, possibly due to better periodontal tissue health in females. A study also reveals gender differences in the elderly, with a higher prevalence in males (57%) than females (43%), indicating a higher risk of periodontal tissue damage in males. Factors such as smoking and alcohol consumption may contribute to these differences [7], suggesting that periodontal damage in males may be more severe than in females.

3.4. Prevalence of Bleeding on Probing Based on Tooth Area

In the prevalence of bleeding on probing (BOP) based on tooth area, a total of 97 inclusion samples are divided into six sextants, as depicted in the table below.

Table 4 The Prevalence of bleeding on probing based on tooth area

Dental Area (Sextant)	BoP Sampel Frequency (+)	Percentage (%)
1	81	83.51%
2	79	81.44%
3	80	82.47%
4	78	80.41%
5	80	82.47%
6	81	83.51%

In the analysis of bleeding on probing (BOP) data based on tooth regions, it was found that sextants 1 and 6 had the highest BOP prevalence, totaling 81 occurrences, surpassing other sextants. In data calculations, if one tooth showed BOP in a sextant, the entire sextant was categorized as having BOP. The elevated BOP prevalence in posterior teeth is attributed to the difficulty in reaching these areas during tooth brushing, especially in the posterior regions of the upper and lower jaws on the right side. Additionally, posterior teeth have pits and fissures on the occlusal surface, facilitating plaque accumulation if not cleaned thoroughly, leading to the development of caries or periodontal diseases. Anterior teeth exhibit lower BOP prevalence due to their more accessible location for toothbrushing, aided by the secretion of submandibular and sublingual salivary glands that protect and cleanse plaque and bacteria on the anterior teeth [8,9].

The study has limitations such as the considerable amount of missing or incongruent medical record data, incomplete periodontal supplements, and non-compliance with criteria. The impact of these limitations results in findings that do not fully reflect the BOP status in the population of periodontology clinic patients at RSGM Universitas Airlangga. Therefore, an adequate sample size is required to achieve a more representative sample for the study.

4. Conclusion

Based on the findings of this research, it can be concluded that in 2022, patients at RSGM Universitas Airlangga who experienced bleeding on probing >10% amounted to 91.76%. The percentage of male patients experiencing bleeding on probing is higher than that of female patients, with the majority falling within the age range of 35-≥65 years. Additionally, tooth regions (sextants) 1 and 6 exhibited the highest prevalence of bleeding on probing.

Compliance with ethical standards

Acknowledgements

We wish to extend our heartfelt appreciation to our teachers, family, and friends for the support rendered throughout the duration of this research endeavor.

Disclosure Conflict of interest

The authors have no conflict of interest to declare.

Statement of ethical approval

This research study was approved ethically by Dental Hospital Airlangga University Health Research Ethical Clearance Commission, with an ethical clearance letter number: No. 195911141986032002.

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