PREVALENCE OF CARIOUS LESIONS AND NON-CARIOUS LESIONS AMONG GINGIVITIS PATIENTS VISITING A DENTAL COLLEGE- A RETROSPECTIVE STUDY

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Abstract: Background: Gingivitis is a non-destructive disease of inflammation of gums. Microorganisms inhabiting the oral biofilm anaerobes which release endotoxins when they penetrate periodontal tissues which result in periodontal damage. Dental caries occur as a result of the imbalance of the indigenous bacteria that accumulate onto the surface. Both dental caries and periodontal disease coincide with each other. **Aim:** This study aims to find the prevalence of carious lesions and non-carious lesions among patients with gingivitis. **Materials and Methods:** The study involves the assessment of patients visiting saveetha dental college. The clinical assessment of both perio-pathogenic, carious lesions, and the non-carious lesion was collected. The data was retrieved and was computed in excel format. It was then compared and analyzed statistically. **Result**: There were 59 males and 41 female patients in this study. Based on age the patients were grouped into 3 groups (20-29 age patients in group 1, 30-39 age patients in group 2, and 40-50 age patients in group 3). It was found that about 71%of the patient examined had gingivitis. Among the patients with gingivitis, about 51% of the patients had caries.
Conclusion: The study concludes there is a close relationship between gingivitis and dental caries.
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Keywords: gingivitis, periodontitis, , non-carious lesion, innovative ,carious lesion

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INTRODUCTION

Periodontal disease is an inflammatory disease of the supporting tissues of the teeth which occurs due to specific microorganisms or a group of specific microorganisms resulting in progressive destruction of the periodontium(1). The microorganism inhabiting the oral biofilm-like anaerobes which release endotoxins that penetrate the periodontal tissues(2). The tissue response to the bacterial antigen can be both protective and destructive(3). If proper oral hygiene is not practised this will result in periodontitis which is characterized by pocket formation, gingival recession(4). It affects the variable number of teeth in variable-rate progression(5). The amount of destruction also depends on the local factors which include age, gender, genetic factors, socioeconomic status, smoking diabetics.(6)
Dental caries is the multifactorial microbial disease resulting in the demineralization of the inorganic material and destruction of the organic material(7). Dental caries is the result of an imbalance of indigenous bacteria that accumulate the tooth surface(8). Some factors like bacterial biofilm, time of diet, the composition of diet are direct factors(9). Socio-economic status, oral hygiene, and snaking are personal factors(10). These factors will widely affect the development of caries(11). If the proper time of diet is not maintained it will, in turn, induce acid reflux which creates an environment for bacterial growth(3). Intermittent snaking is another risk factor(12). This reduces the time of the buffering activity for the salivary enzymes to the carbohydrate from the diet(13). This in turn will turn out to be a perfect place for the growth of oral bacterial microorganisms(14). Whereas a non-carious lesion is the surface loss of tooth structure or material without the involvement of any microorganism(15). In this type, it will be due to excessive forces, intake of the acidic diet which causes surface loss of the tooth structure(16). This includes attrition which is the surface loss of tooth structure due to excessive tooth to tooth contact which leads to the formation of occlusal facets, abrasions which is the surface loss of tooth structure due to direct frictional forces between tooth and external object, erosion is the loss of tooth structure due to chemical-mechanical reaction in presence or absence of microorganisms in the oral cavity.(17)
Studies state there is a potential relationship between caries and periodontal disease(18). A study by Rao F et.al., studied differently in vitro models and coaggregation of periodontal and cariogenic microorganism which implies there is a potential association between periodontal and cariogenic bacteria(3) Previously our team has a rich experience in working on various research projects across multiple disciplines(19–28). Now the growing trend in this area motivated us to pursue this project.
This study aims at finding the association of gingivitis to patients with dental caries and patients with non-caries lesions.

MATERIALS AND METHODS

This study involved analyzing patients who are visiting Saveetha Dental College. Hundred patients aged 20-50 years of age were involved in this study. This study set is a university setting that involves the examination of patients belonging to a particular geographic area. The data was collected from 1-7-2019 to the 31-3-2020 period of Saveetha Dental College. The data including the presence of Dental Caries, clinical probing depth, bleeding of gingiva during probing, the presence of any non-carious lesion was retrieved. In this study, non-carious lesions like attrition and abrasion were considered. All the data was then computed in excel format. It was processed for statistical analysis. For statistical analysis, the processed data was transferred to IBM SPSS statistical analysis software and statistical analysis was done comparing different variables.

Independent factors: Age

Dependent factors: health status, bleeding on gingival probing, clinical probing depth, carious lesion, the non-carious lesion(attrition and abrasion).

Inclusion criteria: patient with gingivitis

Exclusion criteria: patient without gingivitis

Statistical analysis used: Descriptive analysis - Chi-square analysis

RESULTS

This study involved an examination of 100 patients. The ethical approval for the study was obtained from saveetha dental college. There were 59 males and 41 female patients in this study. Based on age the patients were grouped into 3 groups(20-29 age patients in group 1, 30-39 age patients in group 2, and 40-50 age patients in group 3). It was found that about 71%of the patient had gingivitis. Among the patients with gingivitis, about 51% of the patients had caries. Among the patients with non-carious lesions, only 33% of them had caries.

DISCUSSION

This study primarily aimed at analyzing the relationship between the prevalence of carious lesions and non-carious lesions among patients with gingivitis. In previous studies in-vitro models were used, the current study involves analyzing the patient history and clinical examination data of each 100 patients who were included in the study.

Comparing the age of the patient to the presence of bleeding on gingival probing was found to be more in 20-29 years of age(38%) followed by 40-49 years of age(36.6%) and least was present in 30-39 age(25.3%)[Graph-1]. Comparing the presence of bleeding on gingival probing to gender males(59.1%) had more bleeding on gingiva than in females(40.8%)[Graph 2]. Comparing gender to the presence of periodontal pocket to gender incidence in males(60.2%) more than females(47.8%)[Graph 3]. On comparing gender to the presence of attrition males(69.4%) more than females(30.6%) but the negativity was high as (87%) average in both the gender[Graph 4]. Similar results were obtained in case of gender comparison with the presence of abrasion[Graph 5]. Comparing age to the presence of periodontal pocket 20-29 age group was high(36.6%) followed by 40-50 age group(33.8%) and the least (29.5%) were in 30.39 age group [Graph 6]. Comparing age to the presence of attrition 58% of attrition found in the 20-29 age group and 40-50 age group had 42% attrition [Graph 7]. On comparing age to presence of abrasion about 52.9% abrasion was found in the 40-50 age group followed by about 35.2 % in 30-39 years of age[Graph 8]. On comparing the presence of bleeding on probing to the presence of caries about 50.7% of the patients with caries had gingivitis and the percentage of one factor decreased when the other was decreased ie.., both of the factors were directly proportional to each other[Graph 9]. Similar results were obtained comparing the presence of periodontal pocket with the presence of caries[Graph 10]. Comparing bleeding on gingival probing was inversely proportional.[Graph 11]

A study by Rao et.al., found co-aggregation of the periodontal pathogens to cariogenic bacteria was specific(3). It was opposed by Fine et.al. In this study *A. actinomycetemcomitans* and cariogenic bacteria growth in vitro and found the *A.actinomycetemcomitans* had an inhibitory effect on the growth of cariogenic bacteria. Further, they also found that saliva positive for *A.actinomycetemcomitans* killed S.mutans(4). Saotome et.al. did a study on 368 individuals comparing salivary levels of cariogenic bacteria, periodontal status, and root surface caries. They found an increase in the level of lactobacillus in persons with increased loss of attachment(5). Iwano et.al., compared salivary levels of S.mutans and P.gingivalis in patients with gingivitis (which was clinically present and absent) found that negative gradient i.e., an inverse relationship when the P.gingivalis is reduced the S.mutans level was high(6)(29).

Almost in the current study, we were able to find similar results like previous studies in a different way. But compared to other studies we included a relatively low sample size. Adding in the current study only a particular group of people belonging to one geographic area was considered. Further in non-carious lesion erosion and abfraction was not included in the study. So a study involving more samples and coping with the above limitation will be done.Our institution is passionate about high quality evidence based research and has excelled in various fields (30–36). We hope this study adds to this rich legacy

That way we were able to get more appropriate results.

CONCLUSION

Thus from the present study, we were able to find dental caries are more prevalent in patients with gingivitis. Even Though there are many studies opposing this statement, the cause of the occurrence of both periodontal disease and dental caries is multifactorial. So there will always be a variation in the interrelationship of both the factors. Further adding to the current study more samples including different geographic areas would be done to get more relevant results coping with the limitations of the current study.

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Author Contribution:

Ajrish George S has contributed to data collection, study design, data analysis, results, tables, and manuscript preparation.

Dr. Sankari Malaiappan has contributed to the manuscript preparation, proofreading of the manuscript, and reviewing the manuscript.

Dr. Nashra Kareem has contributed to formatting and reviewing the manuscript.

Conflict Of Interest: There is no conflict of interest.

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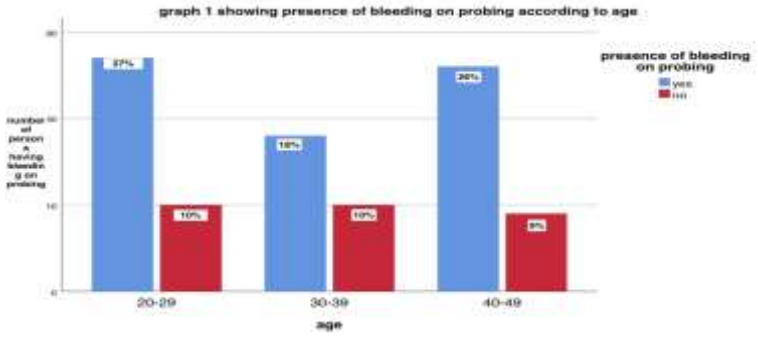
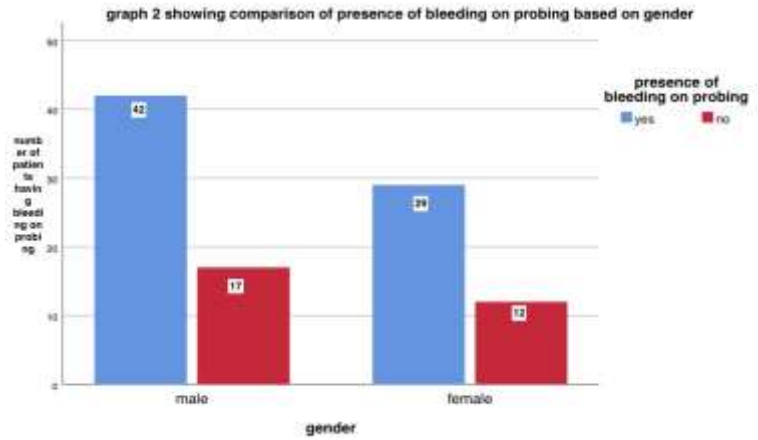
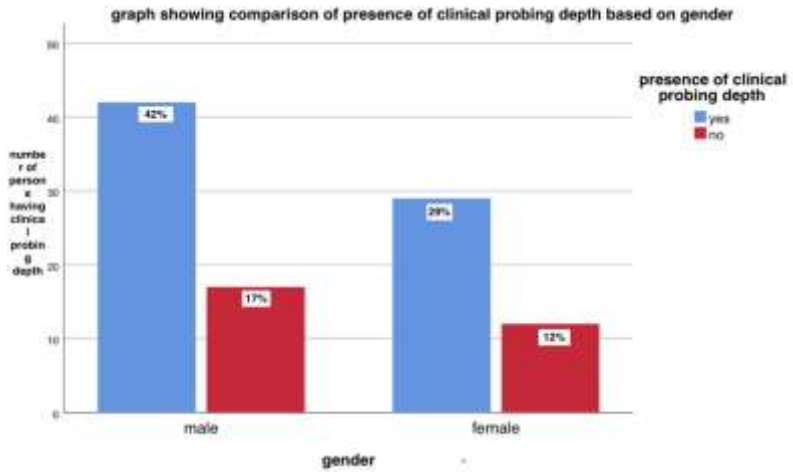


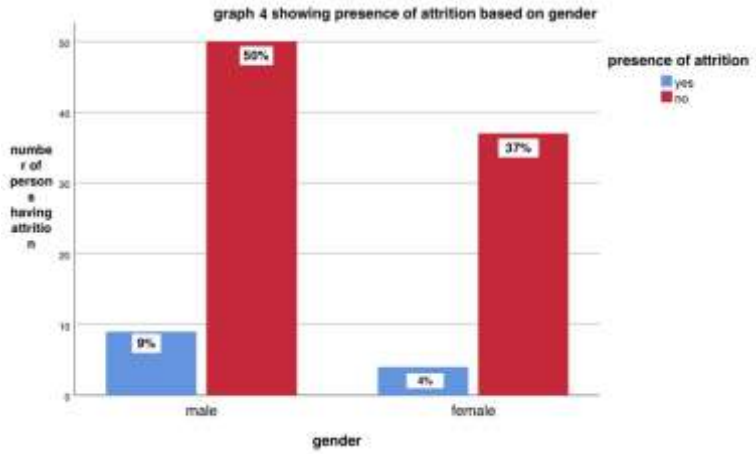
Graph 1. bar chart showing association of age to the presence of bleeding on probing. The X-axis represents the age group and the Y-axis represents the number of persons having bleeding on probing. Blue bar shows the positive presence of bleeding on probing and red bar shows the negative presence of bleeding on probing.



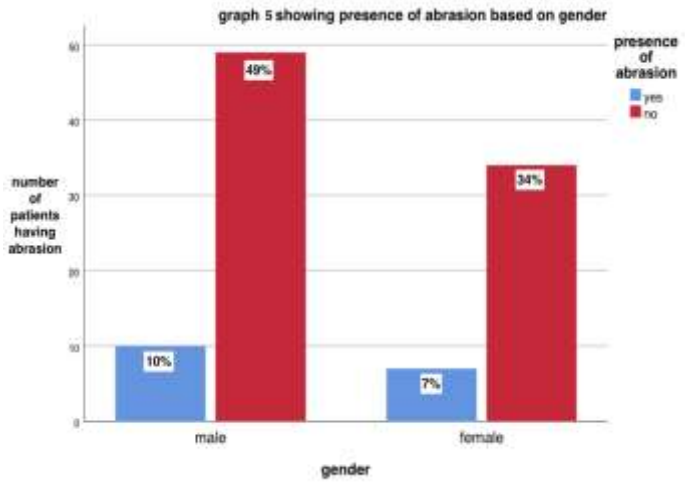
Graph 2. bar chart showing association of the presence of bleeding based on gender. The X-axis represents the gender of the person and the Y-axis represents the presence of bleeding on probing. The blue bar shows a positive presence of bleeding on probing and red bar shows the negative presence of bleeding on probing.



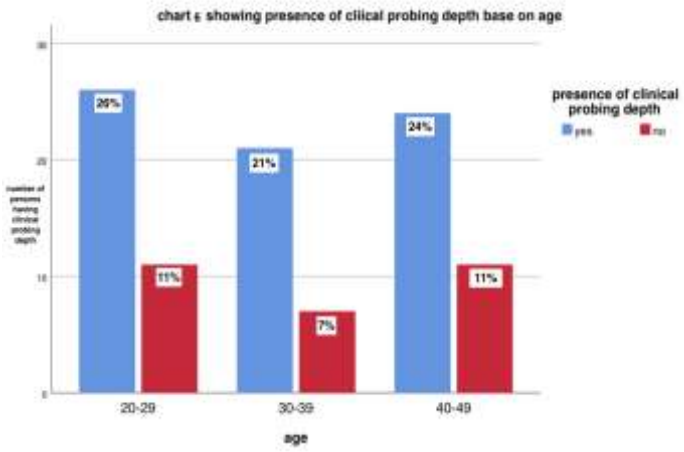
Graph 3. bar chart showing association of gender to presence of clinical probing depth. The X-axis represents gender and the Y-axis represents the presence of clinical probing depth. The blue bar shows positive presence of clinical probing depth and the red bar shows negative presence of clinical probing depth.



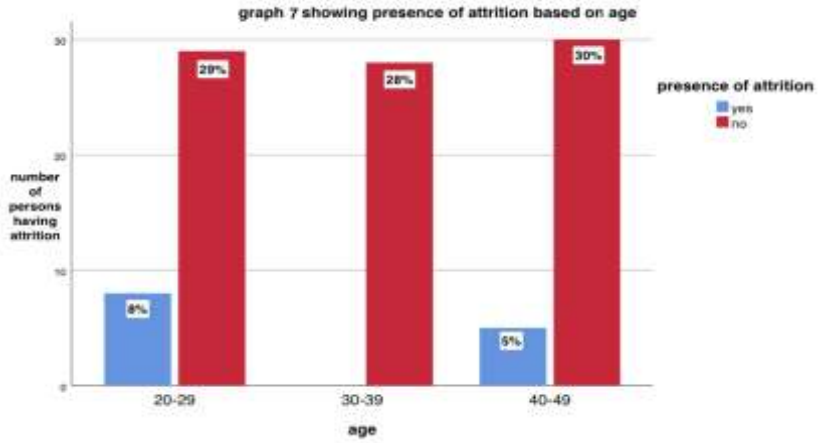
Graph 4. bar chart showing association of gender to the presence of attrition. The X-axis shows age of the patient and Y-axis shows the number of persons having attrition. The blue bars show a positive presence of attrition and red bars show the presence of attrition.



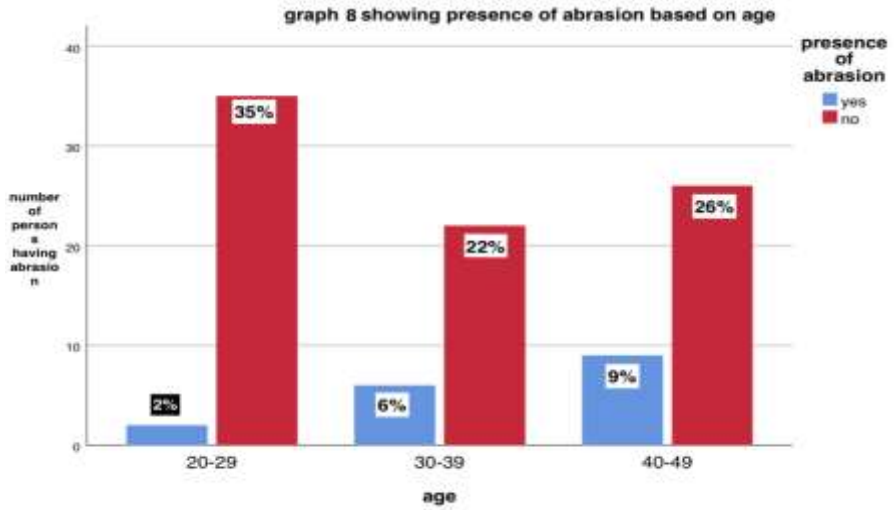
Graph 5. bar chart shows the association of gender to the presence of abrasion. The X-axis represents the gender of the patient and Y-axis represents the number of patients having abrasion. The blue bars denote the positive presence of abrasion and red bar denote the negative presence of abrasion.



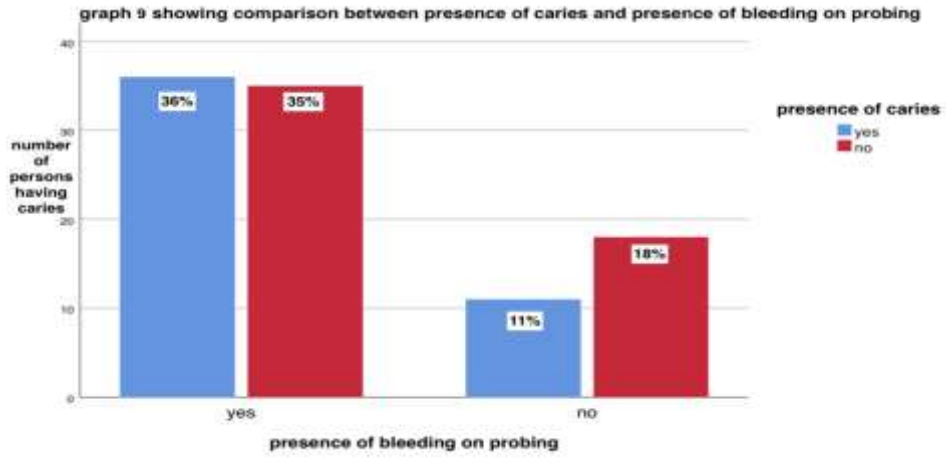
Graph 6. bar chart showing association of age to presence of clinical probing depth. The X-axis represents the age group and Y-axis represents the number of patients having clinical probing depth. The blue bar denotes the positive presence of clinical probing depth and the red`bar shows the negative presence of clinical probing depth.



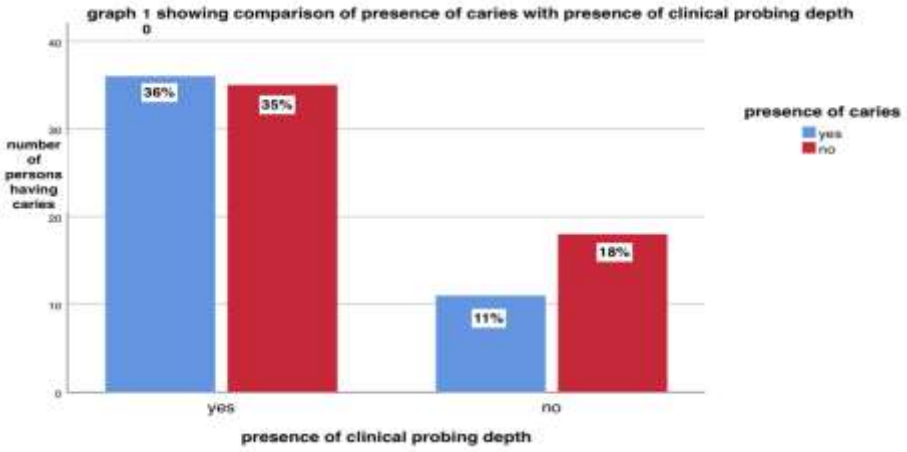
Graph 7. bar chart showing association of age to presence of attrition. The X-axis represents the age group of the persons and the Y-axis represents the number of persons having attrition. The blue bars show a positive presence of attrition and red bars show negative presence of attrition.



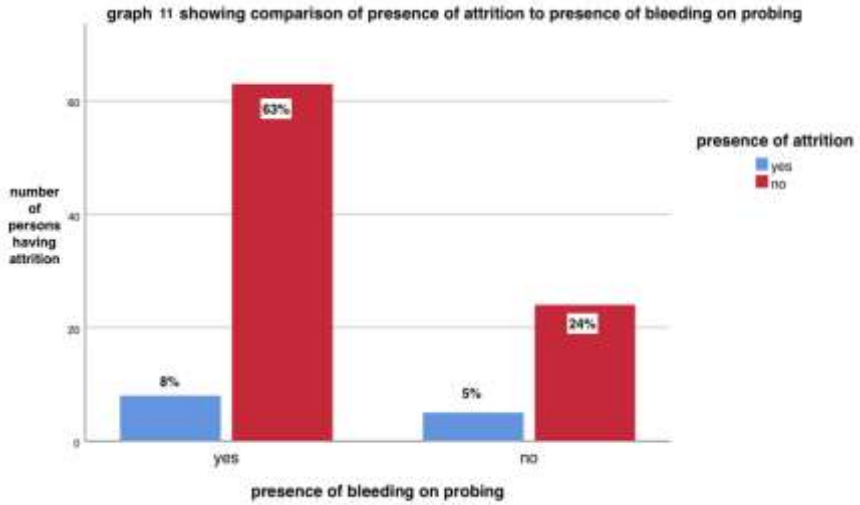
Graph 8. bar chart showing association of age to presence of abrasion. The X-axis represents the age groups and the Y-axis represents the number of persons having abrasion. The blue bar shows positive presence of abrasion and red bars shows the negative presence of abrasion.



Graph 9. bar chart showing association of presence of caries and presence of bleeding on probing. The X-axis represents the presence of bleeding on probing and the Y-axis represents number persons having caries. The blue bars show the positive presence of caries and the red bar shows the negative presence of caries.



Graph 10. bar chart showing association of the presence of caries and presence of clinical probing depth. The X-axis represents the presence of clinical probing depth and the Y-axis represents the number of persons with caries. The blue bar denotes the positive presence of caries and the red bar denotes the negative presence of caries.



Graph 11. bar chart showing the association of the presence of attrition to presence of bleeding on probing. The X-axis represents the presence of bleeding on probing and the Y-axis represents the presence of attrition. The blue bars show the positive presence of attrition and the red bars show the negative presence of attrition.