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Factors influencing Periodontal Condition in Adult patients. A Clinical Cross-Sectional Study

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ABSTRACT

Background: Periodontal diseases are widely growing among adults and this condition is less common among individuals that put significant consideration into maintaining their oral hygiene.
Objective: The present study aims to analyse the factors that are significant in determining the prevalence of periodontal diseases among adults. In addition, this study aims to analyse the prevalence of non-surgical and surgical treatment that were done for patients who need.
Methods: A total of 197 individuals were included through the inclusion and exclusion criteria. Four experts calibrated examiner and a standardized technique of clinical and radiographic examination was done for all the sample. Pearson chi-square test was used to analyse the data.
Results: Results of the study provided that the prevalence of periodontal disease was significantly common among males, while poor oral hygiene served as the most common cause. Besides, the prevalence of non-surgical treatment was common among female population.
Conclusion: A positive relation appears to exist between the gender and periodontal status. Furthermore, lack of oral hygiene serves as the main cause of periodontal conditions. Non-surgical treatment for periodontal conditions is the dominant and is preferred in the most of cases.

Key words: Periodontal conditions, Surgical treatments, Non-surgical treatment, Periodontal disease, Periodontitis, Complications

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INTRODUCTION

Periodontal disease refers to infectious disease that result in severe tooth-related issues such as tooth loss or the destruction of the periodontium. Conditions where tooth hygiene is not maintained result in the formation of micro-organisms that further form deep periodontal pockets. This condition is less common among individuals that put significant consideration into maintaining their oral hygiene [1]. The timely diagnosis related to different periodontal conditions is highly significant, as in certain cases the severity of infections results in irreversible complications [2]. Periodontal disease causes inflammation in the soft tissues of the teeth, destroying supporting structures. The overall prevalence of this condition ranges from 10% – 90% among the adult population [3]. Risk factors associated with the development of the periodontal disease have been stated as; poor oral hygiene, gender difference, poor economic status, increasing age, low education level, psychological distress, smoking and use of tobacco. Behal et al. [4] posit that the excessive use of tobacco is highly effective in causing the colonization of visible and deep periodontal pockets, that contains high levels of periodontal pathogens within them. The accumulation of pathogenic microorganisms in the oral cavity may result in dental plaque leading to periodontal conditions. To prevent the pathology, patients are usually provided basic preventive knowledge regarding the effective maintenance of oral hygiene. It has been shown that an increase in the number of gram-negative bacteria and anaerobes within the subgingival plaque causes the development of periodontal disease [5].

The procedure of professional tooth surface cleaning and screening for cavities/gum disease is routine during a dental visit [6]. Useful information regarding the current inflammatory status of periodontal tissue is provided by the periodontal probing depth. This may even indicate the chronicity of local inflammation.

There is a significant association between gingivitis and dental plaque. The young, adult, and senior populations across the world depict the existence of disparities in the level of periodontitis [7]. These disparities are associated with different aspects of periodontal conditions, including aggressive and chronic conditions. A study conducted by Manrikian et al. [8] surveyed to investigate the tendency of increasing periodontal indices. The results reported around 2.04% cases of periodontal probing depth (4–5 mm). The periodontal conditions can be prevented and treated through appropriate selection and implementation of certain strategies derived based on epidemiologic data.

The data regarding the periodontal status of adolescents is scarce. Gautam et al. [9] provided important knowledge regarding the prevalence of periodontal diseases among individuals, where male participants were commonly affected through deep and shallow pockets. Besides, the prevalence of early-stage periodontal diseases was more common among children, whereas, in adults, the disease was highly severe. This determines the need of providing knowledge regarding preventive measures among individuals [10].

The prevalence of periodontitis is detected among patients with a special reference to gender. The study aims to analyse the factors that are significant in determining the prevalence of periodontal diseases among adult patients. In addition, this study aims to analyse the prevalence of non-surgical and surgical treatment that were done for the patient who need.

METHODOLOGY

The study is based on the cross-sectional epidemiological approach to evaluate the prevalence of periodontitis based on the population gender. Before conducting this study, the ethical approval was obtained from the review board of the centre where the study took place (register number 002-13).

A total of 197 individuals were selected and stratified by random sampling based on inclusion and exclusion criteria. The inclusion of participants was based on the conditions; patients with no history of periodontal treatment in last six months, the individual should have at least twenty teeth, and should be presented with minimal periodontal disease with a minimal 1-2 interdental clinical attachment loss at the site of greatest lost. Individuals with any systemic disease (like cancer, diabetes mellitus, HIV, immunosuppressive therapy, and metabolic disease), and pregnancy/lactation were excluded from the study.

Four expert calibrated examiners were appointed for performing the clinical evaluation. Calibration of examiners is important for incorporating standard examiners in the study. For quality purposes, the inter-rater reliability was checked using Cohen's Kappa value. Here, Kappa was calculated to be 0.76 indicating substantial agreement which was between the range of 0.38 to 0.93 for various output measures. The interclass correlation coefficient total score recorded by all four examiners was 0.99, which is excellent.

Demographic data were collected via review of medical records and personal interview in conjunction with clinical evaluation. These data included: gender, smoking status, and parafunctional habits. their parafunctional habits were checked by the examiners by examining tooth shape and muscles. Moreover, the subject's periodontal status was evaluated using the following measures: Plaque Index (Turesky-Gilmore-Glickman modification of the Quigley Hein Plaque Index 1970), Gingival Index Gingival Index (Loe and Silness 1967), probing depth and clinical attachment level. Furthermore, periodontal charting was recorded clinically and radiographically for proper periodontal health diagnosis. Probing depth and clinical attachment level was measured clinically and radiographically using a standard UNC-15 periodontal probe at six sites per tooth. At each site PD, recession and CAL were calculated based on the probed distances in millimetres from gingival margin to CEJ and the base of sulcus. The data regarding surgical and non-surgical periodontal

treatment was also obtained which indicated those who were treated surgically and those that did non-surgical treatment, respectively. Pearson chi-square test was used to analyse the data using Statistical Package of Social Sciences (version 23.0).

RESULTS

The identification regarding the prevalence of periodontal disease suggested several factors that are usually responsible for periodontal diseases among various individuals. Reasons such as poor oral hygiene and smoking are responsible for the prevalence of such disease. To provide important knowledge regarding periodontal conditions, certain background knowledge is collected to identify the causes through common habits among the selected sample. Also, the dental hygiene was checked by the examiners.

Table 1 below provides the demographic details of individuals since data was collected. As per the given information in Table 1, most of the participants included females with a frequency of 125, while 75 of them were males. Smoking habits were not common among the selected individuals, as 164 participants responded with 'No'. Next includes maintenance of oral hygiene, among the given sample 73 individuals responded for poor oral hygiene, while 106 responded for a fair status of oral hygiene, however, only 18 provided good results. Next includes parafunctional habits that were common among minimum individuals i.e., 27, while other 170 responded for No.

Table 1: Demographic details of patients.

Measure	Items	Frequency	Percentage
Gender	Males	72	36.5
	Females	125	100
Smoking habits	Yes	33	16.8
	No	164	83.2
Oral Hygiene maintenance	Poor	73	37.1
	Fair	106	53.8
	Good	18	9.1
Parafunctional habits	Yes	27	13.7
	No	170	86.3

Table 2 provides details regarding periodontal condition that were held among both males and females. The prevalence of periodontal disease was common among males with an overall percentage of 53%. However, 47% of females supported periodontal disease with a significant p-value of 0.000, indicating a positive relationship between periodontal disease and gender differences.

Table 2: Prevalence of periodontal disease based on gender differences.

Crosstab						
			Periodontal disease		Total	P-value
			Yes	No		
Gender	Male	Count	50	22	72	
		%Within periodontal disease	53%	21.40%	36.50%	0
	Female	Count	44	81	125	
		%Within periodontal disease	47%	78.60%	63.50%	0
Total		Count	94	103	197	
		%Within periodontal disease	100%	100%	100%	0

Table 3 provides details regarding the prevalence of non-surgical periodontal treatment based on gender differences. The prevalence of non-surgical periodontal treatments was common among females with the given ratio of 71.9%, while only 28.1% of males were treated through non-surgical treatments, with a p-value of 0.024 indicating a significant relationship between them.

Table 3: Prevalence of nonsurgical periodontal treatment (NSPT) based on gender differences.

Crosstab						P-value
			NSPT		Total	
			Yes	No		
Gender	Male	Count	27	45	72	0.024
		%Within NSPT	28.10%	44.60%	36.50%	
	Female	Count	69	56	125	0.024
		%Within NSPT	71.90%	55.40%	63.50%	
Total		Count	96	101	197	0.024
		%Within NSPT	100%	100%	100%	

Table 4 provides results regarding the prevalence of surgical periodontal treatment among individuals, based on gender differences. However, the treatment was common among females with 59.3%. While 40.7% of males were treated through surgical treatment indicated the maximum ratio for females. The attained p-value 0.785 determines an insignificant value between them.

Table 4: Prevalence of surgical periodontal treatment (SPT) based on gender differences.

Crosstab						P-value
			SPT		Total	
			Yes	No		
Gender	Male	Count	11	61	72	0.785
		%Within SPT	40.70%	41.80%	36.50%	
	Female	Count	16	109	125	0.785
		%Within SPT	59.30%	58.20%	63.50%	
Total		Count	27	170	197	0.785
		%Within SPT	100%	100%	100%	

DISCUSSION

This study aims to identify the prevalence of periodontitis with a reference to gender. The results of the present study indicated that most of the individuals, maintained fair levels of oral hygiene, however, poor oral hygiene served as one of the fundamental causes of periodontal diseases. Baiju et al. [11] provided similar results while investigating the prevalence of periodontal diseases. The oral health of the sample was examined followed by the predictors of periodontal pockets and gingival bleeding. Findings of the study indicated that the prevalence of periodontal conditions such as clinical loss of attachment, gingival bleeding and periodontal pockets were common. Lack of oral hygiene was indicated as the major predictor of the given problems.

Our study revealed that the prevalence of periodontitis in males are significantly more than females. This finding agrees with previous studies [9,12-17]. The increased prevalence could be since females are more aware about maintenance of their oral hygiene and regular professional dental care. Chylińska et al. [18] did a study on the role of gender in the active attitude toward treatment and health and they reported that women showed a more active attitude, understand, and know more about their health. They also experience more positive emotions and have stronger motivation to be engaged in their health issues. This is also supported by the result of our study in regarding to the non-surgical treatment which show a significant increasing in female than male which means they are more aware regarding the professional maintenance visits.

Cases that required surgical treatment in the current sample were limited. And this is in consonance with other studies. Gautam, et al. [9] endorsed the findings of the existing study, where surgical treatments were preferred to limited individuals since most of the sample was treated through non-surgical treatments providing successful outcomes. Our study however illustrated important information regarding the need for oral hygiene instructions since most of the patients showed poor oral hygiene maintenance.

The results of the study are significant as it provides important knowledge regarding the prevalence of periodontal diseases in relation to gender. Medical experts belonging to the given field can highly benefit from the findings of the study as it helps in providing significant knowledge. Besides, academics belonging to the given field can also have a greater advantage from the findings, as data provided in the study is highly beneficial in contributing towards important information. There were several limitations of the study, the effect of smoking status on periodontal status participants were

not classified based on their smoking status as light or heavy smokers. Also, the present study involves a certain limitation in the form of time, resources, and small size. This provides a way for future researchers to study the given idea by including maximum sample size, also be adding other important variables such as the type of periodontal diseases that are most common among adults.

CONCLUSION

Within the limitation of this study, a positive relation appears to exist between the gender and periodontal status. Furthermore, lack of oral hygiene serves as the main cause of periodontal conditions. Non-surgical treatment for periodontal conditions is the dominant and is preferred in the most of cases, while the surgical treatment is restricted to specific conditions that need more invasive treatment.

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