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The Prevalence of Periodontal Disease in Different Age Groups and Different Populations of Pakistan

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Abstract. This study aims to check the prevalence of periodontal disease in different age groups in different populations of Pakistan. This study selected a three age group and three types of periodontics. Correlation, regression analysis and Chi-square test show the relationship between different variables with a significant $P < 0.05$. The males have a high prevalence as compared to females. Age shows a weak positive relationship (0.28) with periodontal disease at 0.05. Effects of hard drinks have positively and significantly been predicted with age and standardized beta value ($\beta = 0.0\text{-}19$, $P < 0.05$). The effect of tobacco smoking has been negatively and significantly predicted with age and standardized beta value ($\beta = -.027$, $P < 0.05$). The model summary has highlighted that R square has explained 0.012% of the variation and all other factors that led to 2.081% variation in age groups. Our research supports the association between age and smoking because periodontal disease and smoking are still major public health problems.

Keywords: periodontal disease, age group, regression, correlation

Introduction

Globally, 538 million people were estimated to be affected by this disease. According to the United States the half of them affected at the age of thirty, while 70% are those over sixty-five years old. Periodontal disease and its conditions are classified in the International Conference in 1999, which proposed the endorsed group of advisory American association in 1997 (Armitage, 2000). Ongoing gum disease and constant periodontal disease persist started and are supported by the microbes from dental plaque (Lourenço *et al*., 2014). Periodontal disease hinders centers on improving currently available individual interventions and understanding which public health initiatives are effective and sustainable in real-world settings. As a result of this discussion species are especially destructive and can drive illness, For a long time, the American Association of Periodontics has ordered periodontal sickness into two classifications, *i.e*., gum disease and periodontitis (slight, moderate, serious and recalcitrant) as indicated by the territory of the gum in question (Armitage, 2004). Smokers have all the dreadful periodontal status and experience more genuine tooth holdup than non-smokers and after changes for covariates; inescapable assessments have shown higher development speeds of continuous periodontitis and tooth mishap and treatments have demonstrated below average consequences of both non-cautious and cautious periodontal treatment in smokers differentiated and non-smokers (Kinane and Chestnutt, 2000).

Smoking cigarette is a critical changeable threat issue for continuous periodontists, as exhibited during alliance, development and intervention inspections with inferable risk checks heading off to someplace in the scope of 2.5 and 7.0. Amazingly, signs of gingival exacerbation can be less expressed in smokers than in non-smokers, considering vaso-constriction and updated gingival tissue keratinization (Nociti *et al*., 2015). Periodontitis is a significant inflammatory illness of the oral mucosa which has been linked to several other chronic inflammation and related diseases, including cardiovascular-metabolic, neuro-degenerative and autoimmune diseases as well as cancer (Hajishengallis and Chavakis, 2021).

According to a review of the research published in the last 25 years, systemic low bone mineral density (BMD) is linked to alveolar bone loss and new confirmation also supports a link between clinical attachment loss and other periodontitis parameters (Yu and Wang, 2022).

Multiple standard variables were used as simultaneous equations in regression analysis in all independent variables or predictors. In independent variables, its power predicted and evaluated that was offered and

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covered by all independent variables (Raja *et al*., 2010). This process is also called multiple regression analysis. Using regression analysis, we will find out how much variance is present independently and also independent variables. Then after analysis, we will explain the variance in two different groups (Khalili-Damghani and Amiri, 2012). It is also showing the linear relationship between two variables, in Pearson correlation its values do not indicate completely which is characterized by their relationship (Kinane *et al*., 2006).

Materials and Methods

Questioner design. A questionnaire was designed to investigate special needs individuals they were divided into three groups, visual disability group (VDG), severe braking retardation group (SBRG), addiction to anything (AAG)

The three-part of the questionnaire was designed. Part 1 includs the questions about the socio-demographic of patients and Part II includs the question about oral health practice and experience with periodontal disease (Fig. 1 and Table 1) and Part III question about awareness and oral health knowledge (Fig. 2). Daily brush routine,

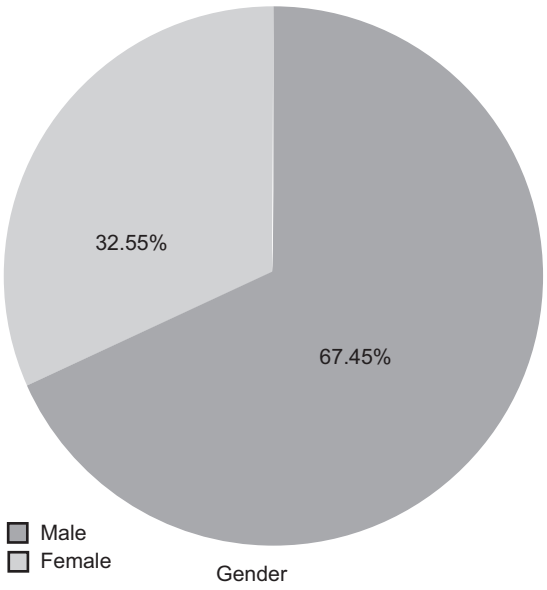

Fig. 1. Percentage of the age of patients with periodontal disease, the percentage of periodontal disease patients which is 67.45% males and 32.55% females participated. This study shows that men have more dental problems than women.

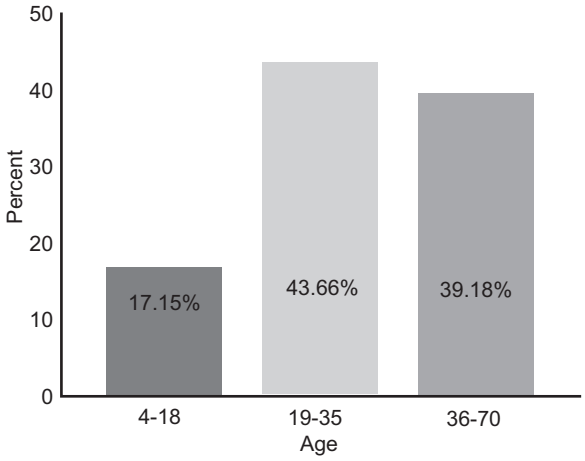

Fig. 2. Percentage of the age of patients with periodontal disease, at the age of 4-18 years, 17.15% of periodontics have periodontal disease which belongs to the group I. In group II, 43.66% of periodontal patients between the ages of 19-35 have periodontal problems. 39.18% are in the group III and have periodontal disease between the ages of 36-70. The study found that patients between the ages of 19-35 had more dental problems than young people and the elderly.

periodontitis use dental floss, where they feel to drink cold and hot things and have a plaque on their tooth surface, periodontitis have gums problems *i-e* they have bleeding in gums during toothbrush and periodontitis gingival swelling or gingival problems and have also bacterial infection. If any surgery require due to periodontal disease, they uses mouthwash in routine. What do they use to clean their teeth? what do you think is the common thing that causes periodontitis disease? what do you think, is the common cause of plaque? periodontitis often visits to doctor in routine, what do you think, how can we prevent periodontal disease? This type of questionnaire based on the previous survives and asked the socio-demographic characteristics including name, education level, age, marital status, profession and gender.

Participant. Adult peridotites (> 18-year-old) in the public of Pakistan were selected as participants. The questionnaire was distributed to the public of Pakistan who has periodontal disease. The sampling of the population was collected according to their age, gender and place in the whole population of Pakistan.

Table 1. Experienced with periodontal disease

Characteristics	Variables	Numbers of (%)
Marital status	Yes	71.73
	No	28.27
Profession	Students	27.88
	Employ	60.43
	Jobs	11.70
Education	Illiterate	5.26
	Primary	5.46
	Middle	8.38
	Matric	14.04
	Secondary	28.46
	Bachelor	23
	Master	15.40
Routine of toothbrush	Do daily brush	90.84
	Don't brush	9.16
Dental floss	Yes	30.99
	No	69.01
Sensitivity	Yes	60.23
	No	24.95
	May be	14.81
Gum problems	Yes	49.90
	No	36.65
	May be	13.45
Gingival swelling or Gingival problem	Yes	61.21
	No	38.79
Bacterial infection on teeth	Yes	54.58
	No	25.73
	May be	19.69
Relatives suffer from teeth disease	Yes	43.08
	No	36.45
	May be	20.47
Surgery	Yes	46
	No	54
Use of mouthwash	Daily basis	33.14
	Mouthwash	50.88
	Once a week	15.98
Brush timing	60sec	30.41
	1-2 minutes	39.57
	2-3 minutes	30.02
Product	Toothpaste	67.25
	Toothpowder	17.93
	Neem twig	14.81
Often do their brush	Once a day	40.35
	regularly Twice daily	34.895
	After every meal	17.93
	do brush Sometimes	6.82
Visit dentist	In three months	13.26
	After six months	22.03
	Once a year	18.13
	Never visit	46.59
Considered essential for causing gum disease	Sweet and sugar	54.58
	Age progression	20.27
	Bacterial infection	20.47
	No idea	4.68
Sort of an addiction	Cigarette	7.02
	Hard drinks	17.93
	Pan	5.07
	Huqqa	4.29
	Other things	7.60
	Not addicted to anything	58.09
Missing teeth by caused by age	Due to periodontal disease. Due to caries.	50.68 30.02
	Due to overage	19.30

Continued.....

Data collection. Data were collected from face-to-face interviews. For this purpose, a paper-based questionnaire method was chased. The survey was done by interviewing the population of Pakistan who has any periodontal disease. The answers were documented on the question paper and it will take 15-20 min.

Data analysis. All collected data were entered in SPSS 21 software, according to their socio-demographic and experience with peridotites, after entering the data display the multivariance variable and showed the relationship between two or multiple variables. The variables manifest the relationship between multiple variables using the frequency distribution and the percentage of the variables. Multiple tests were done to find out the significance between variables using the correlation and regression analysis, parson's Chi-square and independent sample t-test to compare the mean with a P-value of <0.001 and >0.05 to show the relationship between variables.

Results and Discussion

In Fig. 3 the bar chart manifests the percentage of extraction of teeth due to periodontal disease. Periodontics 40.35% of don't lose their teeth. 22.03% of peoples lost 1 tooth due to periodontal disease. 21.25% of periodontics lost 2 teeth due to periodontal disease. 5.85% of periodontics extracted 3 teeth due to periodontal disease. 4.68% of periodontics extracted 4 teeth due to periodontal disease. 4.48% lost 5 with the decline of 1.36% of periodontics extracted 6 teeth due to periodontal disease. In Fig. 4 shows the percentage of periodontics on how to prevent periodontal disease, 33.72% of periodontics say that it will be prevented by using brushing and flossing, 16.96% of periodontics say that it will be prevented by having a soft diet, 41.33% says that it will be prevented by taking vitamin C only and 7.99% of periodontics says that they don't know how to prevent the periodontal disease.

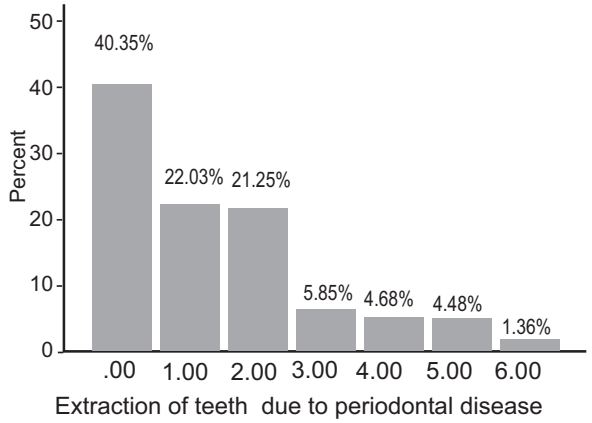

Fig. 3. Extraction of teeth due to periodontal disease.

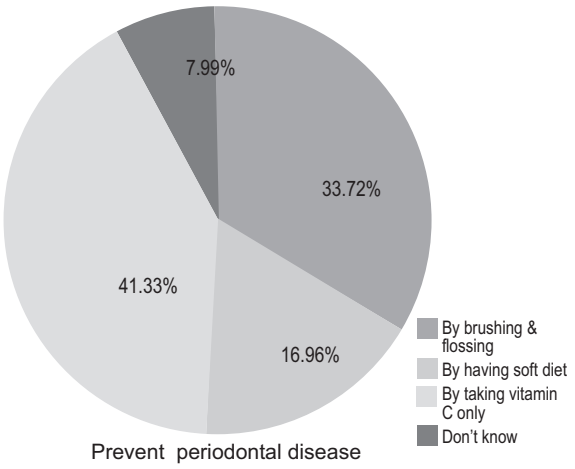

Fig. 4. Percentage of preventing periodontal disease.

Distribution of adults within age: group I (visual disability), group II (severe braking retardation), group III (addiction).

In this study, Table 2 shows the distribution of periodontics within age. Periodontics were divided into three groups. In group, I visual disability periodontics were selected from different age groups. In group II severe braking retardation Periodontics was selected from 3 age groups. In group III physical disability periodontics were selected from three age groups. Old periodontics were selected from three groups in the age range of 4-18 years. 34 (6.6%) periodontics were selected from group I 104(20.3%) were selected from group II and 80(15.6%) periodontics were selected from group three. A total of 218 (42.5%) selection was from 4 –18-years-old periodontics.

From the above study, Table 3 was designed that shows the correlation among constructs. All relationships were tested at a significant level of 0.01and 0.05 and the relationship/correlation among all five variables was significant. The correlation between age and periodontal disease was strongly positive and significant (r=.28 P< 0.05). The correlation between bacterial infection on teeth and age was negative and not significant (r=-0.71). The correlation between bacterial infection on the teeth and periodontal disease was strongly positive and significant (r=0.24 P< 0.05). The correlation between Plaque on the surface of teeth and age was positive and not significant (r=0.053). The correlation between plaque on the surface of teeth and periodontal disease was strongly positive and significant (r=0 .004 P< 0.01). The correlation between plaque on the surface of teeth and bacterial infection on teeth was strongly negative and significant (r= -0.248 P< 0.05). The correlation between gum problems and age was positive and significant (r=.066 P<0.05). The correlation between gum problems and periodontal disease on the teeth was positive and significant (r=0.078 P<0.05). The correlation between gum problems and bacterial infection in the teeth was positive and significant (r=.083 P<0.05). The correlation between gum problems and plaque on the teeth was negative and significant (r=-.112 P<0.05).

Table 4 has illustrated the effect of cigarettes has positively and significantly predicted age with a standardized beta value (ß =0 .117, P < 0.05). The effect of hard drinks has positively and significantly predicted with age and standardized beta value (ß = 0.019, P < 0.05) and the effect of tobacco smoking has been negatively and significantly predicted with age and standardized beta value (ß = -0.027, P < 0.05) along with another statistical test including standardized beta, standard error, t-test, adjusted R square and F test values along with its significance showing the goodness of fit of the model. Furthermore, the model summary has highlighted that R square has explained .012% of the variation all other factors led to 2.081% variation in age.

In this study, 517 questionnaires were filled out by periodontal disease patients. Their socio-demographic history, relative history, their timing of brush and plaque

Table 2. Patients' age range and distribution of adults

		Groups			
		Group I	Group II	Group III	Total
Range of age	4-18 ys	34 (6.6%)	104 (20.3%)	80 (15.6%)	218(42.5%)
	19-36ys	31 (6%)	59 (11.5%)	81 (15.8%)	171(33.3%)
	37-70ys	23 (4.5%)	61 (11.9%)	40 (7.8%)	124(24.2%)
Total		88 (17.2%)	224 (43.7)	201(39.2%)	513 (100%)
Chi-square	X2	10.42			
	P-value	<0.05			

presence on their teeth, etc. 67.45% male and 32.55% female participated in this study. All periodontics were from Punjab province Pakistan. Periodontics were divided into three age groups and three types of periodontics were selected for this questionnaire. 90.84% of periodontics do daily brushes, while 60.23% of periodontics feel sensitivity when they eat cold or hot things and 49.90% of periodontics have gum problems due to periodontal disease. 54.58% of periodontics have bacterial infections due to periodontal disease. The periodontics seek 54% surgery for teeth due to any reason and 75.83% of periodontics effects are due to cigarette smoking and 76.4% of periodontics were affected due to the usage of hard drinks with a significant P >0.05. From 2004-2005 there was a significant record available. Inflammatory pathways may play a role in periodontitis' involvement in the risk of an ischemic stroke. Poor periodontal health has been linked to an elevated risk of stroke in observational studies (Sen *et al*., 2018).

Table 3. Correlation analysis between age, periodontal disease, bacterial infection on teeth, plaque and gum problems.

Correlation					
	1	2	3	4	5
Age	1				
Periodontal disease	.028*	1			
Bacterial infection on teeth	-.071	.024*	1		
Plaque on the surface of teeth	.053	.004**	-.248*	1	
Gum's problems	.066*	.078*	.083*	-.112*	1

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

The old studies explained that medical records available in those years correlated to the lack of medical organization. 21.7% of early elder, 21.6% of early adult and 22.5% of late adults are the age groups member that suffers from periodontal disease (Eke *et al*., 2012). This study was available within a report by 47.2% of the adult population suffering from periodontal disease in the US. This study showed that from 2004-2014

Table 4. Regression analysis between age, effect of cigarettes, the effect of the hard drink and effect of tobacco smoking. This Table has examined the relationship between age, the effect of cigarettes, the effect of the hard drink, effect of tobacco smoking

Regression					
Model	Un-standardized coefficients	c	Standardized coefficients	t-test (t)	Significant values
	B	St. Error	beta (ß)		
Constant	1.981	.143		13.967	.000
Effect of cigarette	.195	.079	.117	0.14	.000
Effect of hard drink	.033	.075	.019	.663	.002
Effect of tobacco smocking	-.19	.033	-.027	.572	.003
F= 2.081	df = 3				
Std. dev = 1.000	R2= .012				

chronic periodontics were prevalent in periodontal disease (Tadjoedin *et al*., 2017). According to this study, 42.5% of periodontics were affected at the age of 4-18 years and 33.3% of periodontics were affected at the age of 19-36 years and 24.2% were affected at the age of 37-70 years due to periodontal disease with significant >0.05. According to research, the prevalence of periodontics plaque and periodontal disease declined at the age of 19-44. Only 54% of periodontics were affected, while 44% at the age of 45-64 and 36% in the elder. Only 15 are those who did not fall prey to the disease. According to this study, 8.58% have periodontal disease at the age of 4-18, 17.93% had a plaque on the surface of their teeth and 15.4% of periodontics don't have periodontal disease from early to old age. Gingivitis is present in the age group of 17-25 (35%), while chronic is mostly present in old age of 46-55 (23%) which is confirmed that periodontal disease was present in old age (Eke *et al*., 2015). If we want to have a reliable reference point for measuring periodontal disease and determining significant treatment outcomes, we must first state periodontal health (Lang and Bartold, 2018).

This study shows that periodontics was present in the early age group. In this study, correlation shows that infection of bacteria and plaque on teeth was caused due to periodontal disease. Gum problem caused at old age with significant level P < 0.05. According to a study, a correlation test was applied between age group and periodontal disease with a significant P<0.05. Their correlation coefficient is 0.251 means the severity of periodontal disease increases in older age groups. According to another study, weak correlation presents another factor that contributes to periodontal disease. In our findings, the correlation between periodontal disease and age group with a significant P<0.05 and a correlation coefficient is 0.28 shows there is a weak positive correlation between age and periodontal disease. In this study, cigarettes and hard drinks are positively and significantly P >0.05 predicted with age with standardized beta value. R square was .012 and all other factors lead to a 2.08% variation. Our study concluded that cigarettes and hard drinks affect the older age group.

Conclusion

Our finding supports the association between age and smoking, periodontal disease and smoking are still major public health problems. This study selected a three-age group and three types of periodontics. Correlation, regression analysis and chi-square test show the relationship between different variables with a significant level of P <0.05.

Conflict of Interest. The authors declare that they have no conflict of interest.

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