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The Relationship Between Anthropometric Parameters And Severity Of Periodontitis In Patients Attending A Tertiary Health Facility Ina Suburban Nigerian Population.

Olagundoye Olufemi O[1*], Dosunmu Elizabeth B[2], ArowojoluModupeola O[3],OmotuyoleAderinsola S[4].

1. Lecturer, Department of Preventive and Community Dentistry Faculty of Dentistry Lagos state University College of Medicine Ikeja Lagos.
2. Associate Professor, Department of Periodontology and Community Dentistry Faculty of Dentistry, College of Medicine University of Ibadan.
3. Professor, Department of Periodontology and Community Dentistry Faculty of Dentistry, College of Medicine University of Ibadan. dupearo@yahoo.com
4. Lecturer, Department of Child Dental Health, Faculty of Dentistry, Lagos state University College of Medicine Ikeja Lagos.

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ABSTRACT
Background- Theincreasing prevalence of obesity, overweight and periodontitis is well documentedby various researchers. However only a few studies have examined this relationship in Nigeria.
Objective-This study was to determine the association of anthropometric profiles and severity of periodontitis in patients attending a tertiary hospital in a suburban Nigeriancommunity.
Methods-A case-control study involving 195 subjectsdrawn from patients attending the Family Medicine clinic of the ObafemiAwolowo University Teaching Hospital (OAUTHC), Ile-Ife, Osun state, Nigeria. Self-administered questionnaire was used to obtain information on socio-demographics, intraoral and anthropometric parameters.Data analysis was carried out using Stata 10.Appropriate parameters were determined forboth the continuous and categorical variables. Two-way t-test was used to test for significant difference between the control and study groups. Logistic regression was used to determine the effect of covariates in the prevalence of periodontitis and to adjust for confounders including sex. Statistical significance was inferred at $p \leq 0.05$.
Results- Control group with body mass index (BMI) <24.9kg/m^{2}comprised 95 subjects while 100 were in the study group BMI>25kg/m^2. Male to female ratio was 1:1.6. Prevalence of periodontitis in this study was 68.7%, it was higher in the study group and low income earners. Theanthropometric parameterswere higher in females.Two-way t test shows statistically significant difference between the study and the control groups for mean CAL and PD, PDI was significant only in females ($p<0.05$). Logistic regression shows significant relationship with age,OHI and monthly income in males ($p<0.05$) while age and waist hip ratio circumference were significant factors in females ($p<0.05$).
Conclusion- Prevalence of periodontitis is high in the population studied. Overweight/obesity, increasing age, poor oral hygiene and low socioeconomic factors were significantly associated with periodontitis. Oral health education/promotion and regular assessment of the anthropometric parameters to reduce the incidence/prevalence of overweight and obesity should be further underscored in the population.
KEYWORDS- Obesity, Periodontitis, Anthropometric, Severity, Relationship.

I. INTRODUCTION

Periodontitis results from inflammatory reaction of the periodontium to bacterial plaque, progressing to destruction of the connectivetissueattachment and alveolar bone resorption (1-3).It is a chronic infection with predominantly anaerobic Gram- negative bacteria present as microbial biofilm on the tooth surface.Studies reveal that worldwide, periodontitis in its mild or moderate forms has a prevalence of 13% to 57% in different populations depending on their oral hygiene and socio-economic status (4,5). Periodontitis is no longer a disease restricted to the adult population as it occurs in younger age groups, although less prevalent,it may be more aggressive with the presence of modifying systemic or environmental factors. It is usually initiated as

gingivitis at or soon after puberty but bone and attachment loss may not be seen until later. Although, periodontitis is initiated and sustained by bacterial plaque, host defence mechanisms and the inherent susceptibility of the patient to the disease have a crucial role to play in its pathogenesis (6, 7).

Obesity is defined as body mass index(BMI) greater than 30kg/m^2while 25 kg/m^2 to 29.9 kg/m^2 is considered as overweight.Waist circumference (WC) greater than 102cm in men88cm in women,waist/hip ratio (WHR) greater than 0.90 in men and 0.85 in women(8) is also considered obese.Obesity and overweight has been implicated as important risk factors in many chronic diseases such as atherosclerosis, coronary heart disease, Type 2 diabetes mellitus amongst others (9). Studies have shown that measurement of waist circumference or waist-hip ratio may better predict risk of disease than BMI (10, 11). Obesity is the second most important risk factor for periodontitis after smoking and it's the fastest growing health problem in the world (9, 12, 13).Obesity is a preventable ailment that has tripled globally in the last 40 years. In 2016, more than 1.9 billion adults above 18 years were overweight of which 650 million were obese (8).The prevalence of overweight and obesity is alarming in Nigeria, prevalence ofoverweight ranged from 20.3%to 35.1%, while in 2020,about 12 million individuals were assessed to be obese, with female preponderance (14,15). Suspected culprits are increasing income, urbanization, suboptimal lifestyles choices, and preference for processed diets (15, 16).

Obesity may compromise periodontal health in the younger age groups, as significant association has been found between obesity and prevalence of periodontitis in people aged 18 to34 years, they were 76% more likely to have periodontal disease than similar aged people of healthy weight (17).Large waistlines, at least 86.36 centimeters for women and 101.6 centimeters for men, were about twice as likely to have periodontitis as their slimmer counterparts (17). Waist circumference of dimensions greater than 88cm has an independent significant association with greater pocket depth and shows a close correlation with the amount of visceral adipose tissue (18-20).Excess fat is known to secrete cytokines that damage the periodontal tissues (21). A cause and effect relationship between overweight/obesity and periodontitis has been established in Mediterranean (22,23) and Scandinavian (24,25) studies. The high prevalence of obesity and periodontitis demands a study to assess the relationship and the strength of such amongst Nigerians.

This study aimed to determine the prevalence ofperiodontitis and the anthropometricmeasurements of the subjects. It also assessed the association between periodontitis and bodymass index, waist circumference and waist hip ratio and the relationship with the severity of the disease in asemi-urban population inNigeria.

II. METHODS

The study was cross sectional with the subjects drawn via convenient sampling from patients attending the Family Medicine clinic of the ObafemiAwolowo University Teaching Hospital (OAUTHC),Ile-Ife, Osun state, Nigeria. Only patients aged between 18 and 60 years who consented to partake in the study were included. Patients must have at least 10 teeth present in the mouth (23), of African descent and not on antibiotic or steroid therapy. Excluded were patients currently on periodontal treatment or had scaling and polishing done within the last 6 months, patients who have been diagnosed of diabetes mellitus, coronary artery disease, myocardial infarction, and any immune compromisingdisease. Patients with history of smoking and pregnant women were also excluded. Study sample size was 195, 100 subjects withBMI (≥25kg/m^2)and control group of 95 subjects withnormal BMI (≤24.9kg/m^2).Ethical clearance for this study was granted by the Ethical committee of the ObafemiAwolowo University Teaching Hospital Complex (OAUTHC) Ile-Ife and a written consent was signed by each subject in the study before data collection. Data collection was done using self-administeredquestionnaire which consisted both open and closed ended questions to obtain information on age, sex, marital status, average income, medical and dental history, frequency and technique of tooth brushing, tobacco use. Some subjects who could not read or write had the questionnaire interpreted in the local dialect by someoneelse but not the investigator. Williams periodontal probe was used to assess indices such as simplified oral hygiene index,periodontaldisease index,periodontal probing depth, and clinical attachment loss. Periodontitis was defined as full mouth mean clinical attachment loss (CAL) of more than 0.6mm.The severity wascategorizedas healthy, mild, moderate or severe for mean clinical attachment loss of 0-0.59mm, 0.6-1.5mm,1.6-2.4mm and≥2.5mm respectively (26).All periodontal sites were examined and the mean for the full mouth was estimated.Anthropometric

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measurements (BMI, WC, and WHR)of the selected subjects were carried out by the investigator. The body mass index (BMI) was measured by using a digital weighing scale to measure the weight to the nearest kilogram and the height of the individual to the nearest meterwasmeasured using the stadiometer. The BMI was classified based on the Quetelet index- $^{kg}/_{m}$ 2.

The waist circumference was measured using a tape rule around the narrowest point between the umbilicus and the rib cage in centimeters. The hip circumference was measured using a tape rule around the widest point below the waist in centimeters. Normal values of the anthropometric parameters;BMI–18-24.9kg/m^2 (control in this study),WC - < 102 cm (males)and < 88 cm (females),WHR- < 0.90 (males) and < 0.85 (females).

Data analysis was carried out using Stata 10(Statacorp College Station, Texas). Descriptive statistics was carried out for socio-demographic variables such as age, sex and income per month. For descriptive variables that are continuous, parameters such as mean, minimum and maximum and measures of variability were determined. For descriptive variables that are categorical, simple frequency and percentages were determined. A full mouth mean CAL≥0.6 mm was considered as chronic periodontitis. The prevalence of chronic periodontitis in the subjects was determined statistically using likelihood chi square, this was also done by income per month and severityof the disease.Bivariate analysis using two-way t test was done for the mean values of the intraoral and anthropometric parameters totest significance of the difference between the control and study groups.Logistic regression method for repeated data was used to determine the effect of covariates in the prevalenceof periodontitis and to adjust for confounders including sex. Hosmer-LemeshowGoodness of fit testwas used to assess the fit of the model. This was not significant which showed that the regression model was consistent.Statistical significance was inferred at p≤ 0.05.

III. RESULTS

A total of 195 subjects were included in the study of which there were 76 male (39%) and 119 female (61%) subjects in the study. The study group population was 100 (51.3%) and the control was 95 (48.7%).The largest population were subjects aged 33 to 49years, they were 54(27.7%) with mean BMI of 40.56(±4.77),while the least in number were those aged 57 to 60 years with a population of 18(9.2%) and a mean BMI of 59.56(±0.78) (Table1).

TABLE 1: AGE DISTRIBUTION OF SUBJECTS BY THE BODY MASS INDEX

Age category (years)	Study (BMI≥25kg/m^2) Frequency (%)	Control (BMI≤24.9kg/m^2) Frequency (%)	Mean (SD)	Frequency (%)
18-24	8 (19.5)	33 (80.5)	21.93 (1.69)	41 (21.0)
25-32	21 (45.7)	25 (54.3)	28.18 (2.18)	46 (23.6)
33-49	33 (61.1)	21 (38.9)	40.56 (4.77)	54 (27.7)
50-56	27 (75)	9 (25)	53.39 (2.20)	36 (18.5)
57-60	11 (61.1)	7 (38.9)	59.56 (0.78)	18 (9.2)
Total	100 (51.3)	95 (48.7)	26.10 (5.21)	195 (100)

A large proportion of the subjects, 80 (41%)were low monthly income earners

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≤₦10000while the least were those earning more than ₦100000 which were13(6.7%),following a slightly linear distribution(Figure 1).

Table 2 shows the distribution of the anthropometric parameters of the subjects in the study, the mean BMI of allthe subjects was26.10(±5.21)kg/m^{2}while the mean BMI for the study and control groups was 30.25(±3.86) kg/m^2 and 21.75(±1.73)kg/m^2 respectively. The mean waist circumference(WC) for all the subjects was85.72 (±13.88)cmwhile the mean waist/hip ratio was 0.87(±0.11)(Table 2).These values were higher in females with mean BMI, WHR, WC and HC being 27.11(±5.54)kg/m^2, 0.85(±0.94), 87.57(±13.47)cm and 102.56(±12.44)cm respectively, compared to the males with 24.40(±4.11), 0.88(±13.70), 82.51(±0.07) and 94.15(±12.60)respectively. For the intraoral parameters (Table 3), the mean OHI in the subjects was 3.21(±1.25) and 3.12(±1.14) and 3.10(±1.37) in the study and the control groups respectively. The mean CAL,PD and PDI in the subjects were 1.81(±1.41), 2.66(±0.90) and 2.30(±1.33) respectively while in the study groupwas 2.29(±1.23), 2.01(±0.94) and 2.65(±1.39) in the same order.

FIGURE 1: DISTRIBUTION OF SUBJECTS ACCORDING TO INCOME PER MONTH

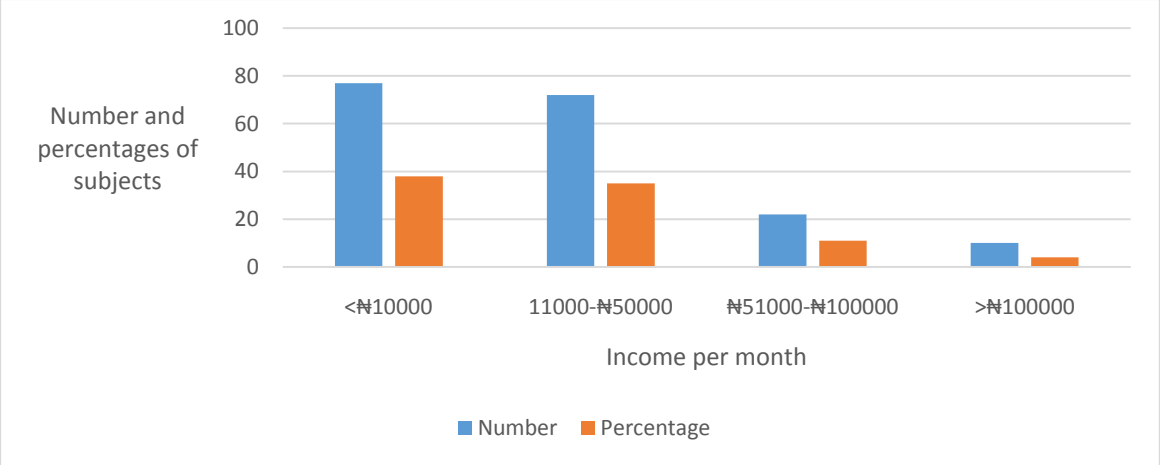


TABLE 2: DISTRIBUTION OF THE ANTHROPOMETRIC PARAMETERS OF THE SUBJECTS.

Variable	Subjects	Male	Female	Study	Control
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Body mass index (BMI) (Kg/m^2)	26.10 (5.21)	24.40(4.11)	27.11(5.54)	30.25 (3.86)	21.75 (1.73)
Waist circumference (WC) (cm)	85.72 (13.88)	82.51(0.07)	87.57(13.47)	95.95 (9.2)	74.95 (8.94)
Hip circumference (cm)	99.34 (13.02)	94.15(12.60)	102.56(12.44)	107 (9.53)	90.62 (13.02)
Waist/Hip (WHR) ratio	0.87 (0.11)	0.88(13.70)	0.85(0.94)	0.89 (0.08)	0.83 (0.08)

International Journal Dental and Medical Sciences Research
Volume 4, Issue 2, Mar-Apr 2022 pp40-50 www.ijdmsrjournal.com ISSN: 2582-6018

TABLE 3: INTRAORAL PARAMETERS OF THE SUBJECTS

Variables	Subjects		Study	Control
	Mean (SD)	Median	Mean (SD)	Mean (SD)
OHI	3.21 (1.25)	3.0	3.12 (1.14)	3.10 (1.37)
CAL	1.81 (1.41)	1.62	2.29 (1.33)	1.32 (1.37)
PD	2.66 (0.90)	2.44	3.01 (0.94)	2.29 (0.69)
PDI	2.30 (1.33)	2.0	2.65 (1.37)	1.98 (1.23)

One hundred and thirty four subjects had whole mouth mean CAL ≥ 1.6mm, hence prevalence of periodontitis among the subjects in this study was 68.7%, it was higher in the study group (91%) than the control (45.3%)(Table 4).Prevalence of periodontitis was lower amongst the males (40.3 %) than the females (59.7 %) but this difference is not statistically significant($p>0.05$). Using a likelihood ratio chi square (Table 5), there was significant relationship as shown between monthly income and prevalence of periodontitis ($p<0.05$).The prevalence was highest (38.8 %) in the low income earners i.e.in those earning ≤₦10000 while the highest income earners≥₦100000had the least prevalence (7.5 %)($p<0.05$). Prevalence of mild, moderate and severe chronic periodontitis in all the subjects was 19%, 13.8% and 35.9% respectively (Table 6), the prevalence of moderate and severe periodontitis in the study groupwas 15% and 51% respectively compared to the control group with less prevalence of 12.6% and 20% respectively(Table 6). There was a linear relationship between age and severity of periodontitis (Figure 2).

TABLE 4: PREVALENCE OF PERIODONTITIS IN THE SUBJECTS.

Periodontitis	study	control	Total
	Frequency (%)	Frequency (%)	Frequency (%)
No	9 (9)	52 (54.74)	61 (31.30)
Yes	91 (91)	43 (45.26)	134 (68.70)
Total	100 (100)	95 (100)	195 (100)

TABLE 5: PREVALENCE OF BY MONTHLY INCOME (₦) OF THE SUBJECTS.

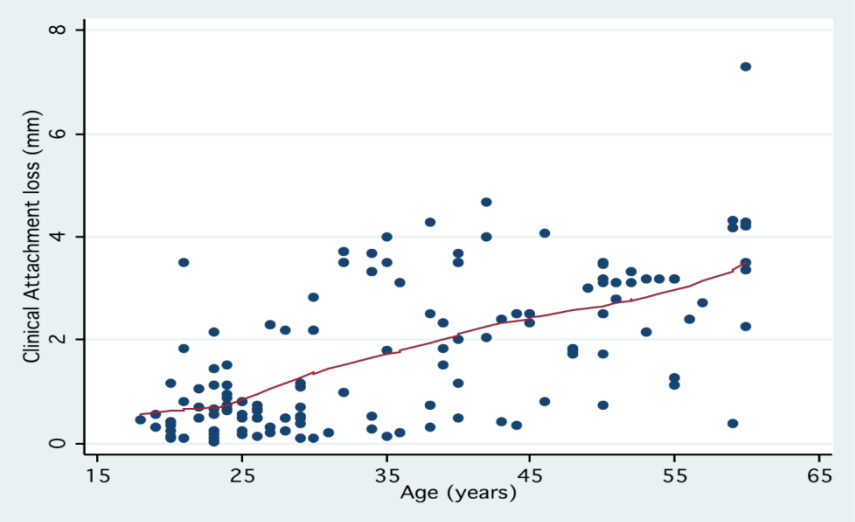
International Journal Dental and Medical Sciences Research
Volume 4, Issue 2, Mar-Apr 2022 pp40-50 www.ijdmsrjournal.com ISSN: 2582-6018

Income per month	Study group (%)		Control group (%)		subjects (%)		Total (%)
	Absent	Present	Absent	Present	Absent	Present	
≤₦10000	10 (38.5)	19 (26.4)	18 (51.4)	33 (53.2)	28 (45.9)	52 (38.8)	80 (41.0)
₦11000-₦50000	12 (46.2)	29 (40.3)	14 (40)	20 (32.3)	26 (42.6)	49 (36.6)	75 (38.5)
₦51000-₦100000	1 (3.8)	16 (22.2)	3 (8.6)	7 (11.3)	4 (6.6)	23 (17.2)	27 (13.8)
>₦100000	3 (11.5)	8 (11.1)	0 (0)	2 (3.2)	3 (4.9)	10 (7.4)	13 (6.7)
Total	26 (100)	72 (100)	35 (100)	62 (100)	61 (100)	134 (100)	195 (100)

TABLE 6: PREVALENCE ACCORDING TO SEVERITY OF CHRONIC PERIODONTITIS IN THE SUBJECTS.

Severity of Chronic periodontitis	Study Frequency (%)	Control Frequency (%)	Total Frequency (%)
Healthy	17 (17)	44 (46.3)	61 (31.3)
Mild	17 (17)	20 (21.1)	37 (19)
Moderate	15 (15)	12 (12.6)	27 (13.8)
Severe	51 (51)	19 (20)	70 (35.9)
Total	100 (100)	95 (100)	195 (100)

FIGURE 2: RELATIONSHIP BETWEEN MEAN CLINICAL ATTACHMENT LOSS AND AGE OF THE SUBJECTS



Two way t-testshowed a statistically significant difference between the control group(BMI≤24.9kg/m^2) andthe study group (BMI≥25kg/m^2) p<0.05 for mean CAL (Table 7).

International Journal Dental and Medical Sciences Research
Volume 4, Issue 2, Mar-Apr 2022 pp40-50 www.ijdmsrjournal.com ISSN: 2582-6018

The mean CAL in the study group was 2.28(±1.33) confidence interval (CI) (2.02, 2.55).There was also significant difference between normal and above normal WC groups in both malesand females. Mean CAL in those with above normal WHR was 2.37(±1.68) CI (1.70, 3.03) and 2.46(±1.24) CI (2.15, 2.7) for males and females respectively, there was statistically significant differencebetween the normal WHR group and those above normal in females only. Mean PD showed a statistically significant difference between control and the study groups ($p<0.05$) (Table 7).The mean PDin those with study group was 3.01(±0.94) (CI) (2.83, 3.20).There was also significant difference ($p<0.05$) between the normal and above normal WC groups in both males and females. Mean PD in those with above normal WHR were 2.85(±0.97) CI (2.46, 3.23) for males and 3.14(±0.92) CI (2.91, 3.37) for females, there was also statistically significant difference in both sexes ($p<0.05$)(Table 7). The mean PDI showed a statistically significant difference($p<0.05$) between subjects in the control and study groups, the mean PDI inthe study group was 2.65(±1.37) CI (2.38, 2.92).There was also statistically significant difference ($p<0.05$) between the mean PDI in the normal and above normal WC groups only in both sexes. There was no significant difference in the mean PDI between the normal and above normal WHR in males, but it was significant in females ($p<0.05$) (Table 7).

A logistic regression (Table 8) to control for the confounders was carried out for bothsexes. Age reflected an odds ratio (OR) (1.17) CI (1.05, 1.33) in males and OR (1.10) CI (1.05, 1.15) in females, this was significant ($p<0.05$). Average income (₦51000-₦100000 per month) with odds ratio of 20.20which was significant in the males ($p<0.05$)and not significant in females ($p>0.05$).WHR was a significant factor only in females OR (36.85) CI (83.24, 1.63) ($p<0.05$).OHIwas significant ($p<0.05$) withOR (2.64) CI (1.12, 6.25) in males but not in femalesOR (1.29) CI (1.80, 2.06)($p>0.05$).Hosmer-Lemeshow Goodness of fit model was used to fit the model and appropriate model checking for consistency was done.

Sixty one subjects with mean BMI of 23.35(±3.50) had healthy periodontium, 37 with mean BMI of 24.78 (±4.85) had mild periodontitis, 27 with mean BMI of 26.65 (±4.39) had moderate periodontitis and 70 with mean BMI of 29.01(±5.46) had severeperiodontitis (Figure 3). This shows a linear relationship between BMI and severity of periodontitis. For the WHR, therewas no linear relationship, the mean WHR 0.83 (±0.63) for the subjects with healthy periodontium was more than for those with mild periodontitis 0.82(±0.09) while mean WHR 0.91(±0.80) of those with severe periodontitis was less than for moderateperiodontitis 0.93 (±0.19). It is noteworthy that for severe and moderateperiodontitis, the mean WHR was > 0.90.The mean WC was 85.2cm, 123.5cm, 123.5cm and 128.5cm for healthy, mild, moderate and severe periodontitis respectively (Figure 3).

TABLE 7: BIVARIATE ANALYSIS OF THE ANTHROPOMETRIC AND INTRAORAL PARAMETERS OF THE SUBJECTS

Variable	Frequency	CAL		PD		PDI	
		Mean(SD)	Pvalue	Mean(SD)	Pvalue	Mean(SD)	Pvalue
BMI (Kg/m^2)							
≤24.9	95	1.32(1.34)	0.001*	2.30(0.70)	0.001*	1.98(1.23)	0.001*
≥25	100	2.28(1.33)		3.01(0.94)		2.65(1.37)	
WC (cm)							
Men							
<102	70	1.77(1.51)	0.04*	2.50(0.08)	0.01*	2.18(1.43)	0.01*
≥102	6	2.59(1.15)		3.34(1.12)		3.52(0.65)	
Women							
<88	62	1.18(1.24)	0.001*	2.33(0.80)	0.001*	2.60(1.41)	0.01*
≥88	57	2.43(1.24)		3.14(0.95)		2.05(1.11)	
WHR							
Men							
<0.90	49	1.59(1.35)	0.06	2.42(0.65)	0.02*	2.12(1.40)	0.17
≥0.90	27	2.37(1.68)		2.85(0.97)		2.59(1.45)	
Women							

International Journal Dental and Medical Sciences Research
Volume 4, Issue 2, Mar-Apr 2022 pp40-50 www.ijdmsrjournal.com ISSN: 2582-6018

<0.85	56	1.02(1.12)	0.001*	2.25(0.77)	0.001*	1.97(1.16)	0.003*
≥0.85	63	2.46(1.24)		3.14(0.92)		2.67(1.73)	

*significant $p \leq 0.05$.

TABLE 8: LOGISTIC REGRESSION CONTROLLING FOR SEX

Hosmer-Lemeshow Goodness of fit test for logistic regression

N = 195
Number of covariate patterns = 57
Pearson Chi^2 = 54.74
P = 0.2667
This ascertains the fitness of the model used for the analysis.

Variable	Female				Male			
			Confidence interval				Confidence interval	
	OR	P value	Lower	Upper	OR	P value	Lower	Upper
Age	1.10	0.001*	1.05	1.15	1.17	0.007*	1.05	1.33
Income								
₦10000-₦50000	1.18	0.788	0.36	3.29	1.39	0.18	0.70	11.53
₦51000-₦100000	2.17	0.352	0.43	11.03	20.20	0.025*	0.87	470.07
>₦100000	1.89	0.604	0.17	21.12	0.15	0.494	0.001	33.60
WHR	36.85	0.003*	83.24	1.63	0.003	0.525	9.61	258.07
OHI	1.29	0.296	1.80	2.06	2.64	0.03*	1.12	6.25

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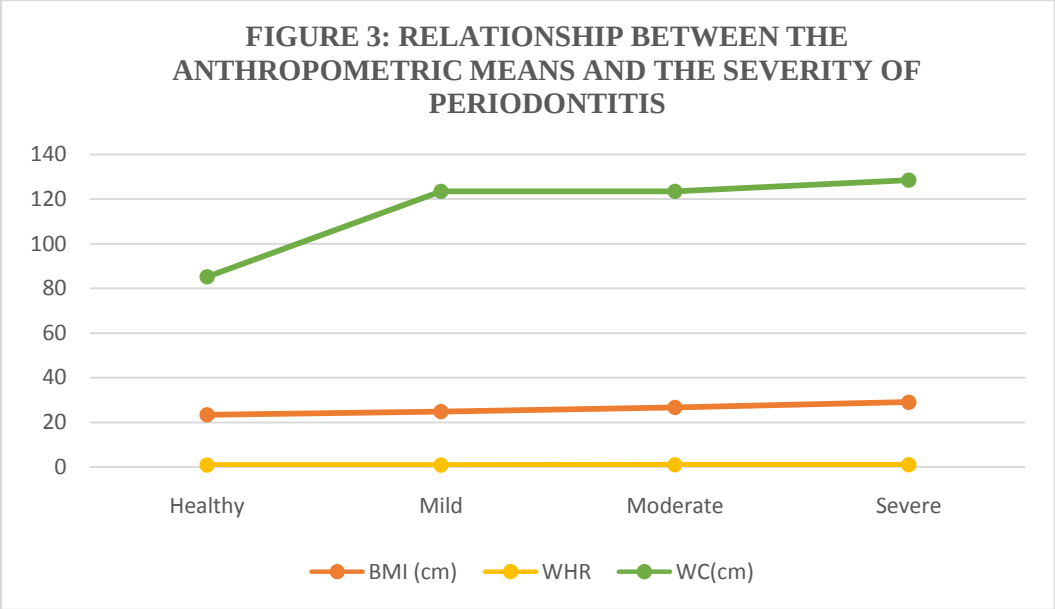

IV. DISCUSSION

It has been suggested that obesity is second only to smoking as the strongest risk factor for inflammatory periodontal tissue destruction (12).However,there is dearth of studies that has assessed this relationship to the severity of periodontitis in Nigeria. The income distribution emphasises the typical structure in third world countries and consistent with survey done in sub-Saharan Africa (27, 28). A large proportion of the subjects (41%) earn less than ₦10000 per month. The average subject in this study is overweight, the mean WC and WHRof the subjects in the study were within normal values, similar to previousstudy (20). The anthropometric values for females were more than for the males except for the WHR which was higher in the males because they haveaveragely less hip circumference among Africans.

Poor oral hygiene was predominant among all the subjects; study and control groups.This is in consonance with the fact that a large percentage of the subjects in this study were of low socioeconomic status,it may also be due to poor oral health awareness in the study location (27, 28).

The prevalence of periodontitis among the subjects studied was 68.7%, this is similar to other studies such as 62.7% in Mexico (29), and 67.8% in Brazil (30). In this study, the severity ofperiodontitis increased with age, which may be as a result of other chronic illnesses associated with ageing, age changes in the periodontium and dwindling attention to oral hygiene in the elderly, this is consistent with a previous study (31). When the income per month was considered, there was an inverse relationship, the lower income earners (<₦10000 and ₦11000-₦50000) had higher prevalence of periodontitis(38.8% and 36.6% respectively).This agrees with a Nigerian study on social class and periodontitis (32) that associated low socioeconomic class with periodontitis.

The mean values of CAL, PDand PDI were significantly higher in the study group than the controls. This is consistent with the study carried out in Japan (33,) and Jordan (22) where a strong association was found between obesity and periodontitis among adults. Females with above-normal WC and WHR had more consistently significant mean CAL, PD and PDI than those with normal. It is also true for the males but not as strong and consistent. This result is consistent with studies done in Finland (24) which found a close correlation between WC, BMI and periodontitis although in contrast to this study, the association of BMI was weak.

The relationship between anthropometric parameters and periodontitis in this study is most likely because the parameters at varying degrees correlate to the level of adipose tissues in the subjects. The adipose tissues secrete cytokines such as TNF-α and interleukin-6 which induces C-reactive protein which is a pro- inflammatory product which has been found to cause both local and systemic inflammatory reactions including periodontitis(34,35).

Logistic regression matching the sexshowed that age was a significant risk factor for periodontitis with odds ratio of 1.17 with every one year increase in age in males and 1.10 with every one year increase in age in the females.This is consistent with findings of a South Korean study (36),and may be because of poor oral hygiene habits and also because systemic diseases and chronic illnesses are commonas individuals age.The socioeconomic status represented by the income per month was also a significant predictor ofperiodontitis, but in this study the middle income earners group (₦51000-₦100000 per month) was the significant group with an odd of 20.20 in the males, this is inconsistent with a Nigerian study (32) which reported low socioeconomic status as a risk factor for periodontitis.Poor oral hygiene status was also a significant risk factor of periodontitis in this study with an odd of 2.64 in males,this isprobably because the male subjects are less conscious of their oral hygiene and aesthetics compared to the females.

Anthropometric parameters represented byWHRwas a significant risk factor in females with an odd of 36.85 per unit increase but was not significant for periodontitis in male subjects probably because anthropometric parameters were higher in the females than in the males, this is comparable to previous findings (20,22). The severity of periodontitis (mild, moderate and severe) increased in a linear fashionin relation to BMI and WC and weakly WHR.This relationship is probably due to the pro-inflammatory cytokines secreted by adipose tissues(35) which may also affect the periodontal tissues.

CONCLUSSION

Prevalence of periodontitis was high among the subjects studied, and it increased with age. Lower income earners had higher prevalence of chronic periodontitis. There was significant association between periodontitis and anthropometric parameters. Age, oral hygiene and socioeconomic status were the significant risk factors in the males while age and anthropometric parameters were the significant risk factors in the females.BMIand WC were positively related to the severity of periodontitis in the subjects studied.Oral health education should be intensified, this will motivate the people to maintain good oral hygiene. Government and policy makers should put in place mechanisms that will improve the socioeconomic status and well-being of the people. Efforts should be made to educate the people about their body weight and waist circumference and the need to keep them within normal limits. This will reduce their risk of many chronic diseases including chronic periodontitis.Dental patients should be assessed routinely for BMI, WC and WHR; this is because a good control of these parameters may help in the management of periodontitis.Home visits by social workers and community health personnel should be emphasized; this will make provisions for the aged that cannot easily access health facilities.

Conflict of interest- none

V. REFERENCES

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