ISSN: 0976-3031

Available Online at http://www.recentscientific.com

International Journal of Recent Scientific Research
Vol. 7, Issue, 11, pp. 14401-14404, November, 2016

International Journal of Recent Scientific Research

Research Article

PHYSICAL FITNESS ANDDIETARY HABIT LEVELS AMONG DIFFERENT PERIODONTAL HEALTH CONDITIONS INDIVIDUALS - A CROSS SECTIONAL QUESTIONNAIRE STUDY

Sheethalan, M.S.R and Sankari, M

Department of Periodontics, Saveetha Dental College, Chennai

ARTICLE INFO

Article History:

Received 17th August, 2016
Received in revised form 12th September, 2016
Accepted 04th October, 2016
Published online 28th November, 2016

Key Words:

Healthy diet, physical activity, gingivitis, periodontitis Perindopril; Indapamide; RP-HPLC; Validation.

ABSTRACT

Objective: The present study aims at determining the physical activity and dietary habits levels among different periodontal health condition (healthy gingiva, gingivitis and periodontitis) individuals.

Materials And Methods: The study was conducted among 300 people (100 healthy gingiva, 100 gingivitis and 100 periodontitis) attending the outpatient department at saveetha dental college. The data were collected in the form of questionnaire which includes demographic data, anthropometric measurements, physical activity level and dietary habits. All the 300 patients underwent periodontal health examination.

Results: The mean age of healthy controls, gingivitis and periodontitis patients were 30 ± 6, 33±9, 42±11 and the mean BMI were 23.1 ±2.5, 24.1±3.2 ,24.4±3.1 respectively.68% of the periodontitis patients were found to be overweight or obese compared to 43% among the healthy controls. The mean positive responses among subjects in both physical fitness questionnaire and dietary habits questionnaire with a maximum average positive response for healthy controls and minimum average responses for periodontitis patients. The difference in the mean was also found to be significant at 5% level among the groups for both the questionnaire ($p<0.001$).Both age and BMI showed a significant inverse correlation with positive responses for both the questionnaire. However it was significant at 5% level only for age.

Conclusion: Individuals with healthy gingiva have better physical activity and dietary lifestyle than gingivitis and periodontitis patients. Periodontitis patients have the least physical activity less healthy dietary habits. Also age and BMI are negatively correlated with the healthy dietary habits and physical activities.

INTRODUCTION

Healthy and enhanced quality of life is generally associated with regular physical activity.[1] Many chronic diseases which have influence on periodontal health such as cardiovascular diseases,[2] diabetes[3]and obesity[4]are inversely related to regular physical activity. Studies also show that increased physical activity have relatively low risk of periodontitis.[5]

Dietary habits and nutrition also have an influence on periodontal status by the effect of vitamin C, vitamin E as dietary antioxidants in modulating inflammation,[6] and the impact of overweight which modulates the host immune system leads to greater risk of periodontitis.[4]

Although many studies have shown the effect of dietary habits and physical activity on periodontitis condition studies comparing their levels among different periodontal status individuals are limited. Therefore the aim of the present is to determine the physical activity and dietary habits among different periodontal health conditions individuals (healthy gingiva, gingivitis and periodontitis).

MATERIALS AND METHODS

This study was a cross sectional study conducted among patients attending outpatient department of Saveetha dental college. A total of 300 patients were participated in the study with 100 participants in each group (healthy group, gingivitis group and periodontitis group). Patients who are systemically heathy are only included in the study. Pregnant women and current smokers were excluded from the study. Participants are informed about the objective of the study and patients completed a written questionnaire as described.

Questionnaire

A questionnaire was developed for this study including age, sex, eating habits and physical activity status. The questionnaire had 17 queries. Nine questions assessed the level of physical fitness andeight questions assessed the dietary

Corresponding author:* **Sheethalan, M.S.R
Department of Periodontics, Saveetha Dental College, Chennai

habits. The questions were summarized in table 1. The options were given in yes/no format and it was framed in such a way that the positive results implies healthy dietary habit and physical activity.

Table 1- QUESTIONNAIRE

Questionnaire for Physical Fitness

- Does your job involves rigorous physical activity?
- do you rarely use motorised transport for travel to work?
- do you exercise in the form of walking, cycling regularly?
- do you visit gym of any other form of fitness centre?
- do you stay in sitting posture continuously for less than 4 hours a day?
- do you often use staircase at work or anywhere outside?
- are you invovled in any routine sports activity?
- do you allocate time for fitness guidelines?
- do you follow any fitness guidelines (tv/physical consultant/books)?
- Questionnaire for dietary habits
- are you vegetarian?
- do you consume rich fibrous food atleast once in a week?
- do you consume any other nutritional supplement?
- does your routine meal include greens/fruits regularly?
- do you have the habit of consuming milk?
- do you have the habit of consuming cheese/yogurt/any other milk products?
- do you have the habit of consuming simple or refined carbohydrates occasionally?
- do you have the habit of consuming processed snack food occasionally?

Periodontal Examination

All the 300 patients underwent periodontal examination assessed by Community periodontal index (CPI).The CPI was scored as follows: 0=healthy, 1+Bleeding on probing (BOP), 2= Calculus with or without BOP, 3=probing depth (PD) of 4 to 5 mm, and 4=PD≥6mm.The index teeth were two molars in each posterior sextants and the upper right and lower left central incisors. Measurements were made at six sites (mesiobuccal, mid buccal, distobuccal, mesiolingual, midlingual, and distolingual) per tooth using CPI probe. Groups were defined according to the periodontal status.Individuals in healthy group had a CPI score of 0, gingivitis group had a CPI score of 1 or 2, and periodontitis group had a score of 3 or 4.

Body Mass Index (Bmi) Mesurement Classification

To assess the body mass index of the students (BMI), which was calculated from weight (in kilograms) divided by square of the height (in square meters).The weight status were classified into three categoriesgiven by WHO for Asian type of population: underweight (BMI<18.5kg/m^2), normal weight (BMI of 18.5 to 22.9 Kg/m^2), and overweight (BMI>23 kg/m^2).[7]

Statistical Analysis

Data were analysed using SPSS 16.0 version for windows. All parameters were found to be parametric hence were presented as Mean ± Standard Deviation (Mean ± SD). Comparison of mean positive responses for physical fitness questionnaire and dietary habits questionnaire among gingivitis, periodontitis and control groups were done by Analysis of Variance (ANOVA). Mean individual differences of positive responses among them for both the questionnaire groups were evaluated by Post Hoc test of Bonferroni. Correlation analysis of positive responses with age and BMI were done by Pearson's correlation test (r value from -1 to +1).$p<0.05$ was considered statistically significant.

RESULTS

We had selected 300 patients as our study population such that each group of healthy control, gingivitis and periodontitis comprising of 100 patients each. Patient's general characteristics are summarized in Table 2. The mean age of healthy controls, gingivitis and periodontitis patients were 30 ± 6, 33±9, 42±11 and the mean BMI were 23.1 ±2.5, 24.1±3.2 ,24.4±3.1 respectively.68% of the periodontitis patients were found to be overweight or obese compared to 43% among the healthy controls.

Table 2 General Demographics

	Healthy Controls	**Gingivitis**	**Periodontitis**	**Total**
n	100	100	100	300
Age (Years) Mean ± SD	30 ± 6	33 ± 9	42 ± 11	35 ± 10
Males %	51	57	51	53
Females %	49	43	49	47
BMI* Mean ± SD	23.1 ± 2.5	24.1 ± 3.2	24.4 ± 3.1	23.9 ± 3.0
Under-weight† %	0	4	3	2
Normal‡ %	57	32	29	39
Overweight & Obese‖ %	43	64	68	58

*BMI – Body Mass Index
†BMI ≤ 18.5
‡BMI 18.5 to 22.9
‖BMI ≥ 22.9

Table 3 shows the differences in average positive responses for physical fitness questionnaire and dietary questionnaire among the three groups. There was found to be a gradual decrease of mean positive responses among subjects in both physical fitness questionnaire and dietary habits questionnaire with a maximum average positive response for healthy controls and minimum average responses for periodontitis patients. The difference in the mean was also found to be significant at 5% level among the groups for both the questionnaire (F = 41.507, *p<0.001* for physical fitness questionnaire and F = 65.665, *p<0.001* for dietary habits questionnaire.

Table 3 Mean positive response for questionnaire

	Physical Fitness questionnaire		Dietary Habits questionnaire	
	Mean ± SD	95% CI	Mean ± SD	95% CI
Healthy controls	4.8 ± 1.2	4.6 – 5.0	5.6 ± 1.3	5.3 – 5.8
Gingivitis	3.8 ± 1.5	3.5 – 4.1	4.8 ± 1.5	4.5 – 5.1
Periodontitis	3.1 ± 1.4	2.8 – 3.3	3.4 ± 1.3	3.1 – 3.7
F*	41.507		65.665	
*p***	<0.001		<0.001	

*F – One-way ANOVA
** *p* <0.05 considered statistically significant

We used post hoc test for Bonferroni to assess the significant differences of mean positive responses among the three groups of patients for both the questionnaire. Results are summarized in Table 4 and 5.

From the table, it is clear that there exists a statistically significant difference of positive responses among the three groups of patients. Pictorial representation of the mean positive responses among the three groups for both physical fitness

questionnaire and dietary habits questionnaire were shown in Figure 1.

Table 4 Mean individual difference of positive responses for physical fitness questionnaire among healthy controls, gingivitis and periodontitis patients

		Mean difference of positive scores Between groups	*p** value
Healthy Controls	Gingivitis	1.0	<0.001
	Periodontitis	1.7	<0.001
Gingivitis	Healthy Controls	-1.0	<0.001
	Periodontitis	0.8	<0.001
Periodontitis	Healthy Controls	-1.7	<0.001
	Gingivitis	-0.8	<0.001

**p* <0.05 considered statistically significant

Table 5 Mean individual difference of positive responses for dietary habits questionnaire among healthy controls, gingivitis and periodontitis patients

		Mean difference of positive scores Between groups	*p** value
Healthy Controls	Gingivitis	0.8	<0.001
	Periodontitis	2.2	<0.001
Gingivitis	Healthy Controls	-0.8	<0.001
	Periodontitis	1.5	<0.001
Periodontitis	Healthy Controls	-2.2	<0.001
	Gingivitis	-1.5	<0.001

**p* <0.05 considered statistically significant

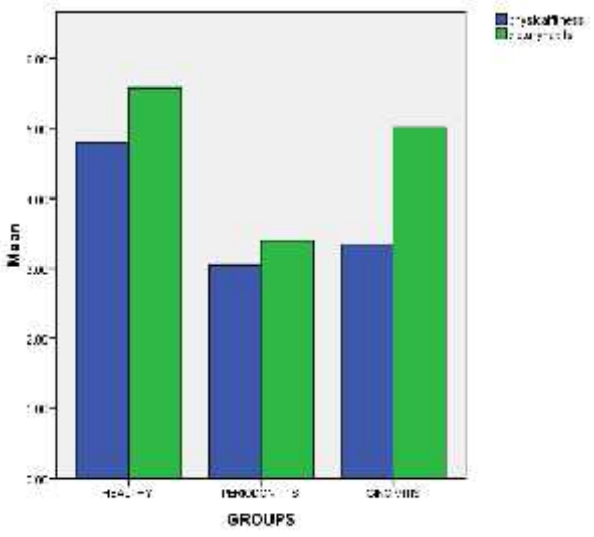

Figure 1

The mean difference of positive response for both the questionnaire was found to be maximum between healthy controls and periodontitis patients with gingivitis patients occupying an intermediate position between those two groups.

We used Pearson's correlation analysis to find the correlation of positive responses of physical fitness questionnaire and dietary habits questionnaire with age and BMI. Results are summarized in Table 6. Both age and BMI showed a significant inverse correlation with positive responses for both the questionnaire. However it was significant at 5% level only for age.

Table 6 Correlation of positive responses with age and BMI

Physical Fitness Questionnaire		
	R*	*p***
Age	-0.342	<0.001
BMI	-0.083	0.151
Dietary Habits Questionnaire		
	R*	*p***
Age	-0.267	<0.001
BMI	-0.091	0.115

*R – Pearson's correlation coefficient
***p* <0.05 considered statistically significant

DISCUSSION

Healthy dietary habits and optimal physical activity has been always associated with disease prevention especially in cases of heart diseases, diabetes, blood pressure and obesity. Many studies have shown poor dietary habits and inadequate physical activity are risk factors of periodontal disease. But in this study compares physical activity level and dietary habits among different periodontal health conditions patients (healthy gingiva, gingivitis, periodontitis) which shows individuals with poor periodontal health condition had decreased physical activity and unhealthy dietary habits. Our results are similar to cross sectional study conducted by Al-zahrani *et al* which aimed at investigating the impact of consuming a high quality diet, undertaking regular exercise and maintain a healthy weight on the risk reduction of periodontal disease in Americans. Data on 12,110 individuals were analysed and it was shown that individuals who maintained health enhancing behaviours such as maintaining normal weight, being physically active and consuming high quality diet were 40% less likely to have periodontitis compared to those individuals who performed no one of these activities.[8] In another study by the same investigator which compares the relation between periodontal disease and physical activity solely. They used data from 2521 individuals who were engaged in third national health and nutrition examination survey. After controlling the gender, race, BMI the result showed the prevalence of periodontitis was higher among inactive individuals (25.2%) than among partially active individuals (16.9%) and those who met the recommended level of exercise (13.0%).[5]

Healthy eating and dietary habits are associated with lower level of periodontal diseases either by its impact on obesity or by the higher consumption of fruits,[9] dairy products[10] and lower consumption of cholesterol.[11,12] Study by Al-Zahrani *et al* showed prevalence of periodontitis was 20% lower for participants in the highest quintile of dairy products(p=0.024).[10]Studies also shows that increased incidence of periodontal disease associated with enhanced concentration of total cholesterol levels.[11,12] Our study results were consistent with the results of these studies.

Our study also correlates age and BMI with physical activity level and dietary habits, which showed a negative correlation for both age and BMI. These findings were consistent with results of the cross sectional study by Tomofuji *et al* which showed overweight individuals with high fatty food and

infrequent consumption of vegetables were associated with increased risk of periodontitis than underweight and normal weight individuals.[13]

Our study has some limitations. The questions were framed by the investigator itself since to our knowledge there was no such standardized questions for assessing physical fitness and dietary habits for Indian type of population. Also different types of periodontitis groups were not taken into consideration.

CONCLUSION

Individuals with healthy gingiva have better physical activity and dietary lifestyle than gingivitis and periodontitis patients. Periodontitis patients have the least physical activity less heathy dietary habits. Also age and BMI had a negative correlation with the healthy dietary habits and physical activities.

References

Blair SN,Franklin B,Haskell WL, Lee IM, Pate RR, Powell KE *et al*. Physical activity and public health: Updated recommendation for adults from the American College of Sports Medicine and the American Heart Association. Med Sci Sports Exerc. 2007;39:1423–34.

Joshi SB. Exercise training in the management of cardiac failure and ischaemic heart disease. Heart Lung Circ. 2007;16(Suppl 3):S83–7.

Franklin B,Williams PT . Vigorous exercise and diabetic, hypertensive, and hypercholesterolemia medication use. Med Sci Sports Exerc. 2007;39:1933–41.

Darbar U, Donos N,Nibali L,Petrie A,Rakmanee T, Suvan JE *et al*. Association between overweight/obesity and increased risk of periodontitis. *J Clin Periodontol.* 2015;doi: 10.1111/jcpe.12421

Al-Zahrani MS, Borawski E a., Bissada NF. Increased physical activity reduces prevalence of periodontitis. *J Dent*. 2005;33:703–10.

Battino M, Bullon P, Newman H,Wilson M. Oxidative Injury and Inflammatory Periodontal Diseases: the Challenge of Anti-Oxidants to Free Radicals and Reactive Oxygen Species. Crit Rev Oral Biol Med. 1999;10:458–76.

World Health Organization (WHO). Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. Lancet. 2004;363:157–63.

Al-Zahrani MS, Borawski EA, Bissada NF. Periodontitis and Three Health-Enhancing Behaviors: Maintaining Normal Weight, Engaging in Recommended Level of Exercise, and Consuming a High-Quality Diet. *J Periodontol.* 2005;76:1362–6.

Dodington DW, Fritz PC, Sullivan PJ, Ward WE. Higher Intakes of Fruits and Vegetables, β-Carotene, Vitamin C, α-Tocopherol, EPA, and DHA Are Positively Associated with Periodontal Healing after Nonsurgical Periodontal Therapy in Nonsmokers but Not in Smokers. *J Nutr*. 2015;145:2512–9.

Al-Zahrani MS. Increased intake of dairy products is related to lower periodontitis prevalence. *J Periodontol*. 2006;77:289–94.

Azuma T,Ekuni D,Kusano H,Tomofuji T, Watanabe T,Yamamoto T. Effects of a high-cholesterol diet on cell behavior in rat periodontitis. Practitioner. 2005;249:752–6.

Battino M,Bompadre S,Granados S,Morillo JM,Quiles JL, Ramirez-Tortosa MC *et al*. Periodontitis is associated with altered plasma fatty acids and cardiovascular risk markers. Nutr Metab Cardiovasc Dis. 2010;20:133–9.

Azuma T, Ekuni D, Furuta M, Irie K, Iwasaki Y, Tomofuji T *et al*. Relationships between eating habits and periodontal condition in university students. *J Periodontol.* 2011;82(12):1642–9.

****

How to cite this article:

Sheethalan, M.S.R and Sankari, M.2016, Physical Fitness Anddietary Habit Levels among Different Periodontal Health Conditions Individuals - A Cross Sectional Questionnaire Study. *Int J Recent Sci Res.* 7(11), pp. 14401-14404.