ORIGINAL RESEARCH

Assessment of Knowledge about Periodontal Disease and Systemic Disease Interrelationship among the White-Collar Professionals in Jaipur City – A Questionnaire Study

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ABSTRACT

Introduction: Periodontal disease is a chronic infectious disease characterized by destruction and loss of supporting tissues of teeth. Many advances in modern medicine strongly postulated periodontal health as an indication of systemic health. Thus, periodontal diseases are closely linked with set of systemic manifestations, such as cardiovascular disease, diabetes mellitus, osteoporosis, respiratory illness, and adverse pregnancy outcomes.

Aim: The present study is designed to assess the knowledge and awareness of oral and systemic disease interrelationship among the white-collar professionals in Jaipur city.

Materials and Methods: A total of 120 white-collar professionals were explained the nature of the study and were given a questionnaire containing 15 questions. The questionnaire pertained to their oral hygiene, dental and medical referrals and checkups, knowledge of oral and systemic disease interrelationship, and the importance of health. The responses were compiled, computed and statistically analyzed for the result.

Results: As per the survey and statistical analysis, it has been found that knowledge regarding periodontal disease and systemic disease interrelationship was lacking in white-collar professionals.

Conclusion: Awareness among the masses regarding periodontal disease and systemic disease interrelationship is lacking and it should be the responsibility of the dentist, physician, and health organizations to educate the masses at large for the same.

Keywords: Cardiovascular disease, Diabetes, Periodontitis, Systemic disease, White-collar professionals.

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INTRODUCTION

Periodontal disease is an infectious disease which is associated with a small number of predominantly Gram-negative micro-organisms present in the subgingival biofilm.[1] According to the World Health Organization, 10–15% population suffers from severe periodontitis. Although periodontal disease affects all age groups, it most commonly affects the adult population.[2] There are certain risk factors such as oral hygiene, diet, gender, diabetes mellitus, smoking, and various socioeconomic factors which are associated with the disease.[3] Periodontitis is often preceded by gingivitis, which in the early stages of the disease cause inflammation and bleeding. Gingivitis proceeds to periodontitis if not treated properly which causes destruction of connective tissue and finally results in tooth loss.[4] Periodontal diseases are closely linked with set of systemic manifestations, such as cardiovascular disease, diabetes mellitus, osteoporosis, respiratory illness, and adverse pregnancy outcomes. Hence, this study was planned to assess the knowledge about periodontal disease and systemic disease interrelationship among white-collar professionals in Jaipur city.

MATERIALS AND METHODS

This was a survey in which a total of 120 white-collar professionals were explained the nature of study and they were given a questionnaire containing 15 questions pertaining to their oral hygiene, dental and medical referrals and checkups, knowledge of oral and systemic disease interrelationship, and the importance of health. They were contacted and given questionnaires mainly at their working places such as institutes, banks, companies, and even to the ones who visited the OPD, Department of Periodontics, Jaipur Dental College, Jaipur. The responses were compiled, computed, and statistically analyzed.

QUESTIONNAIRE

Age: Sex: Educational qualification:
(Please tick one answer)

Q1: How frequently do you brush your teeth?
(a) Once a day (b) twice a day
(c) thrice a day (d) irregular in frequency

Q2: How do you clean your teeth?
(a) Toothbrush + Paste
(b) Toothbrush + Paste + Mouthwash
(c) Toothbrush + Paste + Interdental aids
(d) Others

Q3: How frequently do you visit your dentist?
(a) Once in 6 months
(b) once in 12 months
(c) when there is problem
(d) never visited

Q4: When do you visit your doctor or family physician?
(a) When not feeling well
(b) for a routine general checkup
(C) when referred by someone
(d) other

Q5: How much do you spend on health care per year?
(a) Less than Rs. 1000
(b) More than Rs. 1000 but less than Rs. 2000
(c) More than Rs. 2000 but less than Rs. 5000
(d) More than Rs. 5000

Q6: Has your dentist ever referred you to a physician/doctor?
(a) Yes (b) No

Q7: Has your physician ever referred you to a dentist ?
(a) Yes (b) No

Q8: Do you think gum problem/periodontal disease has a interrelationship with diabetes?
(a) Yes (b) No

Q9: Do you think gum problem/periodontal disease has a interrelationship with cardiovascular disease?
(a) Yes (b) No

Q10: Do you think gum problem/periodontal disease has negative effects on pregnancy outcome (preterm low birth weight infants)?
(a) Yes (b) No

Q11: Do you think gum problem/periodontal disease has interrelationship with respiratory disease?
(a) Yes (b) No

Q12: Do you think gum problem/periodontal disease has interrelationship with bone disease (Osteoporosis)?
(a) Yes (b) No

Q13: Do you know stroke and gum problem/periodontal disease has a interrelationship?
(a) Yes (b) No

Q14: Are you aware that certain blood disorders and gum problem/periodontal disease are interrelated?
(a) Yes (b) No

Q15: Are you aware that certain systemic diseases can be prevented by maintaining good oral hygiene?
(a) Yes (b) No

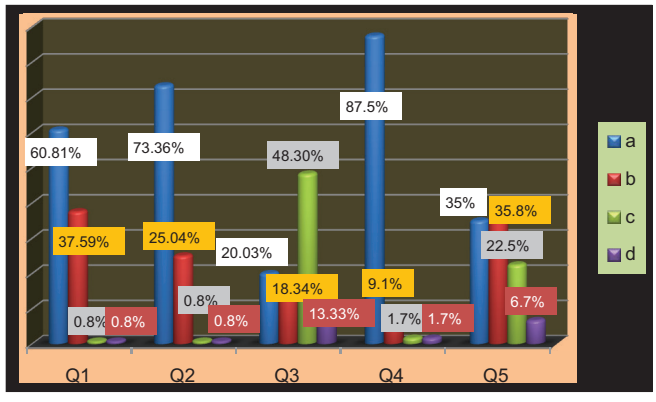
RESULTS

The results were statistically analyzed using SPSS software version 17.

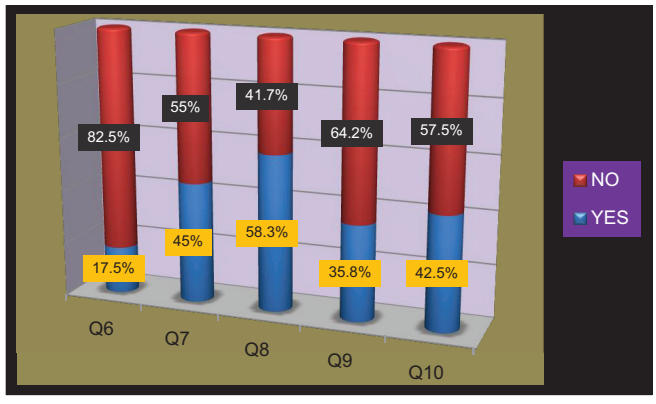
The analysis was done by Chi-square test and Pearson correlation coefficient.

Graph 1 shows that majority of the subjects (60.81%) have the habit of brushing only once a day. About 73.36% of the subjects used only toothbrush and paste to clean their teeth and only 25.04% of them used mouthwash along with brush and paste. Majority (48.3%) of the subjects visited the dentist only when there is problem for them and 13.33% responded that they never visited the dentist. About 87.5% stated that they visit the doctor only when they are not feeling well. Visiting the doctor as a routine general check-up was reported only by 9.1%. Nearly 35% of them reported they spend an amount of Rs.1000–2000/year on health care.

Graph 2 shows that the majority of the subjects (82.5%) have not been referred to the physician by their dentist, while only 45% of their physicians referred them to the dentist. More than half of them 58.3% of them agreed that there exists an interrelationship between periodontal diseases and diabetes, but only 35.8% agreed on the interrelationship between periodontal diseases



Graph 1: Questionnaire response to the questions 1–5



Graph 2: Questionnaire response to the questions 6–10

and cardiovascular diseases. Only 42.5% thought that periodontal diseases have negative effects on pregnancy.

Graph 3 shows that an interrelationship between periodontal diseases and respiratory disease was agreed by 52.5% and that with bone diseases was agreed by only 27.5%. Only 21.7% agreed that stroke and gum or periodontal problems are interrelated. About 60.8% of them are not aware of the interrelationship between blood disorders and gum problems. About 75% reported that they are of the fact that systemic diseases can be prevented by maintaining good oral health.

Table 1 shows that there is a significant difference in the responses of the subjects with respect to questions related to their frequency of brushing habit, material used for cleaning, frequency of visits to dentist, reason for the doctor or physician, and their annual expenditure on health care, dentist referring them to physician, interrelationship between gum/periodontal diseases and systemic diseases such as cardiovascular diseases, stroke, bone diseases, and blood disorders and that maintenance of good oral hygiene can prevent systemic diseases. Only the responses related to the questions about the interrelationship between gum/periodontal diseases and diabetes, pregnancy, respiratory diseases, and referral of the physician to the dentist are not statistically significant.

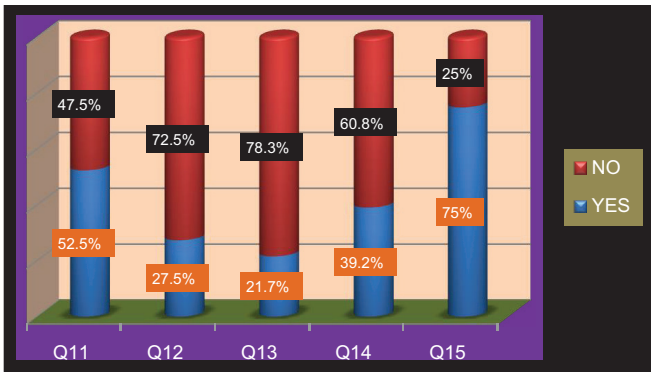
Table 2 shows correlation between the responses to the questions Q1–Q5 and the statistical significance is as follows:

- Q1 shows weak positive correlation with Q2 and negative correlation with Q3 ($P < 0.01$), and weak positive correlation with Q5 ($P < 0.05$)
- Q2 shows weak positive correlation with Q1 ($P < 0.01$)
- Q3 shows weak negative correlation with Q1 ($P < 0.01$)
- Q5 shows weak positive correlation with Q1 ($P < 0.05$)
- Q4 shows weak positive correlation with Q1, Q2 and Q5 and a weak negative correlation with Q3 but the difference is not statistically significant.

Overall, a weak negative correlation is seen for the response to a question related to the frequency of visits to the dentist with responses related to their frequency of brushing habit, material used for cleaning, reason for the doctor or physician, and their annual expenditure on health care.

Table 3 shows the correlation between the responses to the questions Q8–Q15 and the statistically significant difference is as follows:

- Q8 shows weak positive correlation with Q9 and Q11 ($P < 0.01$), negatively correlation with Q12 ($P < 0.05$)
- Q9 shows weak positive correlation with Q8 and Q10 ($P < 0.01$), Q11 and Q13 ($P < 0.05$)
- Q10 shows weak positive correlation with Q9 ($P < 0.01$), Q11, Q12, and Q14 ($P < 0.05$)



Graph 3: Questionnaire response to the questions 11–15

Table 1: Questions showing the significant difference in the response among subjects

Questionnaire	Chi-square value	*P*-value	Significance
Q1	125.200	0.000	Highly significant
Q2	168.200	0.000	Highly significant
Q3	36.000	0.000	Highly significant
Q4	251.800	0.000	Highly significant
Q5	26.867	0.000	Highly significant
Q6	50.700	0.000	Highly significant
Q7	1.200	0.273	Not significant
Q8	3.333	0.068	Not significant
Q9	9.633	0.002	Significant
Q10	2.700	0.100	Not significant
Q11	0.300	0.584	Not significant
Q12	24.300	0.000	Highly significant
Q13	38.533	0.000	Highly significant
Q14	5.633	0.018	Significant
Q15	30.000	0.000	Highly significant

P<0.001 Highly significant, *P*<0.05 significant, *P*>0.05 Not significant

Table 2: Correlation between the questions 1–5

		Q1	Q2	Q3	Q4	Q5
Q1	Pearson correlation	1	0.356**	−0.274**	0.121	0.189*
	Sig. (two-tailed)		0.000	0.002	0.189	0.039
	n	120	120	120	120	120
Q2	Pearson correlation	0.356**	1	−0.171	0.057	0.151
	Sig. (two-tailed)	0.000		0.062	0.538	0.099
	n	120	120	120	120	120
Q3	Pearson correlation	−0.274**	−0.171	1	−0.026	−0.043
	Sig. (two-tailed)	0.002	0.062		0.781	0.639
	n	120	120	120	120	120
Q4	Pearson correlation	0.121	0.057	−0.026	1	0.014
	Sig. (two-tailed)	0.189	0.538	0.781		0.877
	n	120	120	120	120	120
Q5	Pearson correlation	0.189*	0.151	−0.043	0.014	1
	Sig. (two-tailed)	0.039	0.099	0.639	0.877	
	n	120	120	120	120	120

**Correlation significant at the 0.01 level, *Correlation significant at the 0.05 level. (*r*<0.5 is weak correlation, >0.5 is strong correlation) (−*r* value is negative correlation, +*r* value is positive correlation)

Table 3: Correlation between the questions 8–15

		Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
Q8	Pearson correlation	1	0.244**	0.111	0.279**	−0.199*	0.157	0.159	−0.059
	Sig. (two-tailed)		0.007	0.227	0.002	0.030	0.086	0.083	0.525
	n	120	120	120	120	120	120	120	120
Q9	Pearson correlation	0.244**	1	0.307**	0.224*	0.124	0.198*	0.148	0.030
	Sig. (two-tailed)	0.007		0.001	0.014	0.179	0.031	0.107	0.744
	n	120	120	120	120	120	120	120	120
Q10	Pearson correlation	0.111	0.307**	1	0.210*	0.188*	0.162	0.208*	−0.049
	Sig. (two-tailed)	0.227	0.001		0.021	0.040	0.078	0.023	0.598
	n	120	120	120	120	120	120	120	120
Q11	Pearson correlation	0.279**	0.224*	0.210*	1	0.025	0.095	0.114	0.067
	Sig. (two-tailed)	0.002	0.014	0.021		0.784	0.301	0.216	0.464
	n	120	120	120	120	120	120	120	120
Q12	Pearson correlation	−0.199*	0.124	0.188*	0.025	1	0.174	0.194*	0.097
	Sig. (two-tailed)	0.030	0.179	0.040	0.784		0.057	0.034	0.292
	n	120	120	120	120	120	120	120	120
Q13	Pearson correlation	0.157	0.198*	0.162	0.095	0.174	1	0.365**	0.070
	Sig. (two-tailed)	0.086	0.031	0.078	0.301	0.057		0.000	0.447
	n	120	120	120	120	120	120	120	120
Q14	Pearson correlation	0.159	0.148	0.208*	0.114	0.194*	0.365**	1	0.266**
	Sig. (two-tailed)	0.083	0.107	0.023	0.216	0.034	0.000		0.003
	n	120	120	120	120	120	120	120	120
Q15	Pearson correlation	−0.059	0.030	−0.049	0.067	0.097	0.070	0.266**	1
	Sig. (two-tailed)	0.525	0.744	0.598	0.464	0.292	0.447	0.003	
	n	120	120	120	120	120	120	120	120

**Correlation significant at the 0.01 level, *Correlation significant at the 0.05 level. (r<0.5 is weak correlation, >0.5 is strong correlation) (−r value is negative correlation, +r value is positive correlation)

- Q11 shows weak positive correlation with Q8 ($P < 0.01$), Q9 and Q10 ($P < 0.05$)
- Q12 shows weak negative correlation with Q8 and weak positive correlation with Q10, Q14 ($P < 0.05$)
- Q13 shows weak positive correlation with Q14 ($P < 0.01$), Q9 ($P < 0.05$)
- Q14 shows weak positive correlation with Q13, Q15 ($P < 0.01$), Q10, Q12 ($P < 0.05$)
- Q15 shows weak positive correlation with Q14 ($P < 0.01$).

Overall, there is a weak correlation between the responses to the questions related to the interrelationship between gum/periodontal diseases and systemic diseases such as diabetes, cardiovascular diseases, stroke, respiratory diseases, bone diseases, pregnancy, and blood disorders.

DISCUSSION

Majority of the subjects brushed once a day as they had no knowledge of the benefit of brushing twice a day due to limited knowledge of oral hygiene and its importance. The results of the current study are in accordance with the study done by Singh *et al*. (2014)[5] in which majority of the subjects brushed once a day only. Majority of the subjects cleaned their teeth with toothbrush and paste only as they were not aware of adjuncts such as interdental aids and mouthwashes. The results of the current study are in accordance with the study done by Gharpure *et al*. (2016)[6] in which majority of the subjects cleaned their teeth with toothbrush and paste. Majority of the subjects visited the dentist only when they had dental problem. The results of the current study are in accordance with study done by Gharpure *et al*. (2016).[6] Lack of visit was due to no routine oral health checks and guidance for the same. Majority of the subjects visited their physician when they were not feeling well. This may be again due to time constraint and the tendency to visit a doctor only in case of health problems and emergency. Majority of the participants spend <Rs. 2000 on health care per year as they had spent this amount only when there was a genuine need or emergency. Furthermore, they relied on government medical facilities and non-government organizations for health care. Absence of oral health insurance was a critical factor in spending less on oral health. Majority of participants had not been referred to the physician by the dentist. One of the reasons for this may be the dentist might have thought that it may be not mandatory to refer the patient to physician or may be treating the patients without a physician's consent. Less than half of the subjects mentioned that they were referred by the physician to the dentist. The physician might have thought it may not be mandatory to refer a patient for dental checkup as they may be more focussed

on the medical aspect of treatment. They may also be not much familiar about the interrelationship and importance of systemic and dental diseases.

CONCLUSION

Awareness among the masses regarding periodontal disease and systemic disease interrelationship is lacking and it should be the responsibility of the dentist, physician, and health organizations to educate the masses at large for the same.

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