

ORIGINAL RESEARCH

Knowledge, Attitude, and Practice Regarding the Relationship of Periodontal Diseases and Coronary Heart Disease among Dental Students in Jodhpur City, Rajasthan: A Cross-sectional Study

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ABSTRACT

Aims and Objectives: The present study is conducted to explore the knowledge, attitude, and practice regarding the relationship of periodontal diseases and coronary heart disease among dental students.

Materials and Methods: The present study is a cross-sectional questionnaire descriptive study. The present study was conducted in Jodhpur city in Rajasthan state among the dental students studying in private dental college. Dental students present on the day of survey in the clinic and given their written informed consent were interviewed by the single investigator.

Results: It was observed that most of the students (110 [53%]) were between the age of 22 and 25 years of age group. Majority (118 [57%]) of the study participants were male. Majority of the study participants had fair knowledge (103 [49%]), attitude (122 [59%]), and poor practice (99 [48%]) regarding the relationship of periodontal diseases and coronary heart disease. Knowledge regarding the relationship of periodontal diseases and coronary heart disease was significantly ($P = 0.000^{***}$) correlated to the age of the study participants.

Conclusion: From the above results, it has been concluded that both dental students had fair knowledge, attitude, and poor practice regarding the relationship of periodontal diseases and coronary heart diseases. Knowledge among the study participants regarding relationship of periodontal diseases and coronary heart disease was significantly correlated with attitude among study participants. Knowledge regarding

the relationship of periodontal diseases and coronary heart disease was significantly correlated to the age of the study participants.

Keywords: Coronary, Diseases, Heart, Periodontal

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INTRODUCTION

Cardiovascular diseases (CVDs) are a group of diseases that include congestive heart failure, cardiac arrhythmias, coronary artery disease (including atherosclerosis and myocardial infarction), valvular heart disease, and stroke. Among these, atherosclerosis, a major component of cardiovascular diseases, is characterized by the deposition of atherosclerotic plaques on the innermost layer of walls of large- and medium-sized arteries. End-stage outcomes associated with atherosclerosis include coronary thrombosis, myocardial infarction, and stroke.^[1] On the other hand, periodontal disease is an inflammatory disease that affects the soft and hard structures that support the teeth. In its early stage, called gingivitis, the gums become swollen and red due to inflammation, which is the body's natural response to the presence of harmful bacteria. Periodontal diseases range from simple gum inflammation to serious diseases that result in major damage to the soft tissue and bone that supports the teeth. In the worst cases, teeth are lost.^[2]

Various studies^[3-5] in the past show correlation of periodontal diseases with many systemic diseases. One of the associations is between periodontal diseases and cardiac health. According to the World Health Organization (WHO), cardiovascular disease is the main cause of death worldwide.^[6] Many risk factors for coronary heart disease (CHD) have been identified, but a significant proportion of coronary heart disease (CHD)

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cases has not been yet explained by traditional risk factors. Recently, evidence has implicated chronic inflammation in CHD and cardiovascular disease (CVD).^[7]

On the other hand, periodontal diseases associated with elevations of several markers of chronic inflammation.^[8-10] Since evidence has implicated chronic inflammation in the etiology of CHD, an etiologic relationship has been hypothesized between periodontal disease and coronary heart disease.^[7] For these reasons, there has been strong interest in evaluating whether periodontal disease is independently associated with CHD.

It has been shown by various studies that coronary heart disease and periodontal disease have many similar contributing risk factors such as smoking, diabetes, and obesity.^[11-13] Periodontal disease is a direct pathway for which the two diseases could be related.

In a study by Mucci *et al.*^[14] which reported that inflammatory mediators that react in response to periodontal pathogens could have a possible effect on the systemic inflammatory response to the development of atherosclerotic plaque. In a study by de Oliveira *et al.*,^[15] the results indicated that individuals with poor oral hygiene had higher risk of cardiovascular disease. A meta-analysis conducted in the general population which aims to determine the relationship between PD and coronary heart disease states that biological markers such as C-reactive proteins serve as indicators of additional coronary heart disease (CHD). It reported that PD results in approximately 24–35% of increase in risk for CHD.^[16]

In the past, various studies have been conducted among cardiologist,^[4,17] but none of the studies were conducted among dental students to determine the knowledge, attitude, and practice as good knowledge, attitude, and practice at early stage is very important. Therefore, the present study is conducted to explore the knowledge and attitude toward the impact of periodontal diseases on coronary heart disease among dental students.

MATERIALS AND METHODS

The present study is a cross-sectional questionnaire study conducted to determine the knowledge and attitude regarding the relationship of periodontal diseases and coronary heart disease among dental students.

The present study was conducted Jodhpur city, Rajasthan, among the BDS students studying in a private college. Permission to conduct study was obtained from Principal of the dental college. Students studying in the 3rd year, 4th year, and internship were included in the study. Students present on the day of survey given their written informed consent were interviewed by the single investigator. The questionnaire was distributed in the students and was given 30 min to complete it.

Ethical clearance was obtained from independent ethical committee in Rajasthan state. Before the survey, a pilot survey was conducted to check the validity and reliability of the questionnaire. Internal consistency of questionnaires was measured by applying Cronbach's alpha (α) and the value of $\alpha = 0.79$ was measured. Reliability of the questionnaire was measured using test-retest and the values of measured Kappa (κ) = 0.84 and weighted Kappa (κ_w) = 0.89.

A closed-ended questionnaire was framed to measure the knowledge and attitude of practitioners. The first part of questionnaire consists of demographic details of the study participants includes age, gender, year of study, and socioeconomic status. The second part of questionnaire consists of six questions based on the knowledge of the study participants regarding the relationship of periodontal diseases with cardiac health. The third part consists of questions related to attitude of the study participants regarding relationship of periodontal diseases and cardiac health.

Five marks were given for correct answer while 0 marks were for wrong answer. The total marks range from 0 to 30 marks for knowledge questions. The third part consists of attitude questions. Answer to these questions was judged on Likert scale ranging from agree, partially agree, partially disagree, and disagree. Score ranges from 1 to 4 with score increase with more positive attitude. Total score to these five questions ranges from 5 to 20. The fourth part consists of questions on practice regarding regenerative endodontics. Answer to these five questions is in yes or no. Yes was given 1 marks while no has given 0 marks. Total score of this part ranges from 0 to 5.

Table 1: Demographic detail of the study participants

Demographic details	n (%)
Age	
18–21 years	71 (34)
22–25 years	110 (53)
>25	27 (13)
Total	208 (100)
Gender	
Male	118 (57)
Female	90 (43)
Total	208 (100)
Socioeconomic status	
Low	52 (25)
Medium	93 (45)
High	63 (30)
Total	208 (100)
Year of study	
3 rd year	79 (38)
4 th year	81 (39)
Internship student	48 (23)
Total	208 (100)

The data collected were entered into Microsoft Excel 2010. Demographic details of the study participants and knowledge, attitude, and practice scores were determined by applying descriptive statistics. Pearson's correlation was used to assess correlation between knowledge, attitude, and practice of the study participants regarding the relationship of periodontal diseases and coronary heart disease. Chi-square test is applied to find association between demographic variables and knowledge, attitude, and practice. Logistics regression model was applied to obtain impact of independent variables on dependent variables.

RESULTS

Table 1 shows demographic status of BDS students. It was observed that most of the students (110 [53%]) were between the age of 22–25 years of age group. Majority (118 [57%]) of the study participants were male. Most

Table 2: Knowledge, attitude, and practice scores among the study subjects

Variables	Number of subjects	Percentage of subjects (%)
Knowledge		
0–10 (poor)	63	30
11–20 (fair)	103	49
21–30 (good)	42	21
Total	208	100
Attitude		
5–10 (poor)	49	24
11–15 (fair)	122	59
16–20 (good)	37	17
Total	208	100
Practice		
<1 (poor)	99	48
2–4 (fair)	87	42
>4 (good)	22	10
Total	208	100

Table 3: Correlation analysis of demographic variables with knowledge and attitude regarding the relationship of periodontal diseases and coronary heart disease among the study subjects using χ^2 test

Demographic variables	Knowledge		Attitude		Practice	
	χ^2 value	P value	χ^2 value	P value	χ^2 value	P value
Age	0.201	0.000***	1.365	1.241	1.340	2.900
Gender	1.100	0.141	-0.121	0.005*	-2.344	0.111
Socioeconomic status	0.911	1.222	0.340	1.008	0.209	1.000
Year of study	-1.777	2.006	1.107	0.020*	1.130	0.211

*Significant at 0.05% level of significance, ***Significant at 0.000% level of significance.

Table 4: Correlation analysis of knowledge, attitude, and practice among the study subjects using Pearson's correlation

	Knowledge		Attitude		Practice	
	r	P value	r	P value	r	P value
Knowledge		–	0.227	1.401		
Attitude	-0.011	0.622	–	–	2.671	1.204
Practice	2.890	0.041*	0.921	1.234	–	–

*Significant at 0.05% level of significance, ***Significant at 0.000% level of significance.

of the study participants were of medium (93 [45%]) socioeconomic status. Most of students (81 [39%]) were studying in the 4th year BDS.

Table 2 shows that majority of the study participants had fair knowledge (103 [49%]), attitude (122 [59%]), and poor practice (99 [48%]) regarding the relationship of periodontal diseases and coronary heart disease.

Table 3 shows that knowledge among the study participants regarding relationship of periodontal diseases and coronary heart disease was significantly ($P = 0.041^*$) correlated with attitude among the study participants.

Table 4 shows that on applying χ^2 test, it was assessed that knowledge regarding the relationship of periodontal diseases and coronary heart disease was significantly ($P = 0.000^{***}$) correlated to the age of the study participants. Moreover, attitude of the study participants was significantly associated with gender ($P = 0.005^*$) and year of study ($P = 0.020^*$).

Table 5 shows that on applying multiple logistic regression test, it has been determined that male study participants ($P = 0.021^*$) and medium socioeconomic status ($P = 0.000^{***}$) had significant impact on knowledge of BDS students regarding relationship of periodontal diseases and coronary heart disease and the 4th year of study ($P = 0.030^*$) has a significant impact on attitude of the study participants while practice of the study participants was significantly (0.050^*) associated with the 4th year of study.

DISCUSSION

The present study conducted to determine the relationship of periodontal diseases and coronary heart disease among dental students.

Studies have shown that individuals who have cardiovascular disease and periodontal disease share many of the same risk factors such as smoking, diabetes,

Table 5: Multiple logistic regression to show impact of various independent variables taking knowledge and attitude regarding relationship of periodontal diseases and coronary heart disease as dependent variable among the study subjects

Demographic variables	Knowledge			Attitude			Practice		
	Sig.	Exp. (B)	OR (95% CI)	Sig.	Exp. (B)	OR (95% CI)	Sig.	Exp. (B)	OR (95% CI)
Age (22–25 years)	0.229	1.761	1.342–0.922	0.101	2.621	2.981–2.453	0.638	0.735	0.204–2.645
Gender (male)	0.021*	0.634	0.533–2.221	0.599	0.901	1.231–0.761	0.233	1.784	1.701–1.810
Socioeconomic status (medium)	0.000***	1.0		0.122	1.0		0.031	1.0	
Year of study (4 th year)	0.110	0.810	0.682–0.981	0.030*	1.431	1.221–1.634	0.050*	0.207	0.131–0.289

*Significant at 0.05% level of significance, ***Significant at 0.000% level of significance

obesity, and age.^[12-14] Oral microflora and their byproducts can gain systemic access through the circulatory system. When gaining systemic access, oral microbes have the potential to directly influence subclinical mediators of cardiovascular events such as hypercoagulability, atherosclerotic development, or both. Atherosclerosis has a strong inflammatory component^[17,18] and epidemiologic evidence suggests that increased levels of systemic inflammation are predictive of cardiovascular events.^[19,20]

In the present study, among all study participants, 42 (23%) were internship students [Table 1] as compared to the study by Vellayappan^[4] in which 32% of the study participants were interns.

In the present, 103 (49%) of the study participants had a fair knowledge regarding the relationship of periodontal diseases and coronary heart disease as compared to the study by Kashefimehr *et al.*^[16] in which 88% of the study participants have agreed to the point that periodontal disease was more likely to have increased atherosclerosis and risk of myocardial infarction and stroke. In another study by Arpita Gur *et al.*^[21] in which only 23 (16%) respondents were aware that the periodontal disease may be the possible risk factor for coronary heart disease.

In another study conducted by Vellayappan *et al.*^[4] it was observed that 60% of study participants aware of relationship between periodontal disease and Coronary heart diseases.

In the present study, practice regarding the referral system among the study participants was poor, same result was seen in the study by Shwetha *et al.*^[22]

CONCLUSION

From the above results, it has been concluded that both dental students had fair knowledge, attitude, and poor practice regarding the relationship of periodontal diseases and coronary heart diseases. Knowledge among the study participants regarding relationship of periodontal diseases and coronary heart disease was significantly correlated with attitude among the study participants. Knowledge regarding the relationship of periodontal diseases and coronary heart disease was significantly correlated to the age of the study participants.

More studies with larger sample size and multicentric studies are needed to explore the knowledge of the dental students.

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