

A Survey on General Physician's Knowledge and Behavior Towards the Relationship Between Periodontal Diseases and Systemic Health

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Abstract

Background: Periodontal diseases and their important contribution to our overall health has been a field of study in the recent years. This study aimed at investigating the knowledge of general practitioners about the relationship between periodontal diseases and systemic diseases.

Methods: In this study, 168 general physicians practicing in Zahedan, Iran, were randomly selected. A self-designed questionnaire was used. Respondents' demographic characteristics, periodontal disease knowledge, knowledge of associations between periodontal disease and systemic illnesses, and attitudes toward patients' periodontal health and the amount of patients referrals were collected. SPSS version 19 was used to assess the association of knowledge about periodontal disease with gender, age, and work experience ($p \leq 0.05$).

Results: The average knowledge score of all participants was 17.8 ± 4.8 . The correlation coefficient between knowledge and age was 0.264, and it was 0.158 between knowledge and experience, which had no correlation with one another. Moreover, there was no significant correlation between knowledge and sex ($P > 0.05\%$). The least amount of knowledge and referral was of the link between periodontitis and cardiovascular diseases. Participants reported university courses as the major source of knowledge.

Conclusions: The results of this study revealed a moderate level of knowledge of general practitioners about the relationship between periodontal diseases and systemic disease. With the rapidly growing field of periodontal medicine, oral health related training should be an integral part of continuing education courses after graduation to increase collaboration between medical and dental health care professionals to provide better health care services.

Keywords: Periodontal Infections, Systemic Diseases, Knowledge

1. Background

Oral cavity is a mirror of the body and can indicate the general health and wellbeing of our body. Humans have conflicted with diseases of the oral cavity such as tooth decay and periodontal disease from long time ago. Periodontal disease is a common infectious disease of the supporting structures of teeth, which is caused by the interaction between host inflammatory responses to bacterial invasion from the dental plaque. It has become increasingly clear that the oral cavity can act as the site of origin for dissemination of pathogenic organisms to distant body sites (1, 2). The anatomic closeness of microflora in the dental plaque to the bloodstream can facilitate bacteremia and systemic spread of bacterial products, components, and proinflammatory mediators (3). This was introduced as the focal infection theory for the first time in 1911 when it stated that a source of infection somewhere in the body (eg, periodontitis) can affect distant organs via the

blood vessels (4). During 1920 - 1930, the common belief was that infectious oral diseases such as caries and periodontitis were a center of infections in the body and could cause a variety of systemic problems (5). Progress in classification and identifying oral microorganisms in the recent years, and the realization that certain microorganisms are normally found only in the oral cavity, has led to performing more realistic assessment and conducting studies on the importance of these pathogens.

In 1989, a study in Finland demonstrated that poor oral hygiene and dental disease could lead to heart disease. Since then, numerous studies have examined the association between oral diseases and many systemic diseases (6-9). Today, extensive studies have been done that show periodontitis is a risk factor for systemic diseases including cardiovascular disease, stroke, diabetes, premature infants with low birth weight, respiratory infections, and rheumatoid arthritis and, even Alzheimer's disease (3, 7, 10, 11). Poor awareness of periodontal diseases and their consequences

has been reported as the most frequent reason for low cooperation of periodontal patients, with periodontal treatment, and the subsequent failure of these treatments on a community basis (8, 12).

With the introduction of the new concept of periodontal medicine, and the proven role of periodontal disease in some systemic diseases (rather than being considered only as a risk factor), it seems necessary for dentists and other health care personnel specialty physicians to be aware of the importance of this issue and inform and refer patients. This can help prevent the threatening side effects of periodontal diseases (13, 14).

The present study aimed at evaluating the knowledge of general physicians in Zahedan, Iran, about the relationship between periodontal diseases and systemic diseases.

2. Methods

In this study, all general physicians practicing in Zahedan, Iran, were evaluated about awareness of the relationship between periodontal disease and systemic diseases. A cross-sectional survey, using a self-administered questionnaire, was conducted. After obtaining an informed consent, they were given a questionnaire to fill out.

The first part of the questionnaire recorded information about general demographics data such as age, sex, and years from graduation. The second part consisted of 35 knowledge questions about the signs and symptoms of periodontal disease and its association with cardiovascular disease, diabetes, and pregnancy (premature rupture of membrane (PROM), preterm low birth weight (PTLBW), Preeclampsia). At the end, a set of 4 questions was used to evaluate the doctors' behavior towards periodontal disease evaluation, referral to dentists, and receiving consultation.

The questions had 3 answer options: Yes, no, and no comment. The correct answer was given a positive score, a wrong answer a negative score, and no comment had no point. Countined scores were between +35 and -35. The reliability and predictability of the quationare was evaluated before the study with content validity ratio and content validity index by asking 10 dental specialists to review the questions.

After filling the questionnaire, an educational pamphlet about the relationship between periodontal disease and systemic diseases was given to each physician to provide them with correct information on this topic.

Data were collected and then analyzed by t test, and Pearson's correlation coefficient was calculated with SPSS software for windows version 19 (SPSS Inc., Chicago, USA). The significance level was set at 0.05.

3. Results

The study included 168 physicians in the city of Zahedan. All the physicians filled out the questionnaire correctly and completely. Of the responders 101 (60.1%) were male and 67 (39.9%) were female (Figure 1). The mean age of the participants was 34.1 ± 5.2 years (Figure 2). In this study, the mean years of experience of the physicians was 5.9 ± 4.4 (Figures 3 and 4). Additionally, the mean score of periodontal systemic disease awareness of all participants was 17.8 ± 4.8 , which was considered moderate (Table 1).

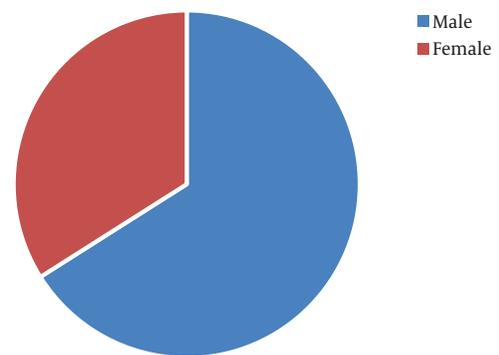


Figure 1. Participant Sex Distribution

Table 1. The Number and Reason of the Referrals to the Dentist

The Reason for Referral	No. (%)	
Physician discretion	77 (47.2)	
Patient preference	8 (4.9)	
Both of them	78 (47.9)	
Total	163 (100)	
Parameter	Yes	No
Refer of patients with periodontal disease, %	97	3
Refer for cardiovascular disease, %	12.5	97.5
Refer for pregnancy, %	98	2
Refer for diabetes, %	95.8	4.2

We found no statistically significant relationship between age and awareness scores ($P = 0.07$). Pearson correlation revealed a 0.264 correlation coefficient between the 2 variables. Pierson correlation test was also used to assess the relationship between age and work experience with awareness scores.

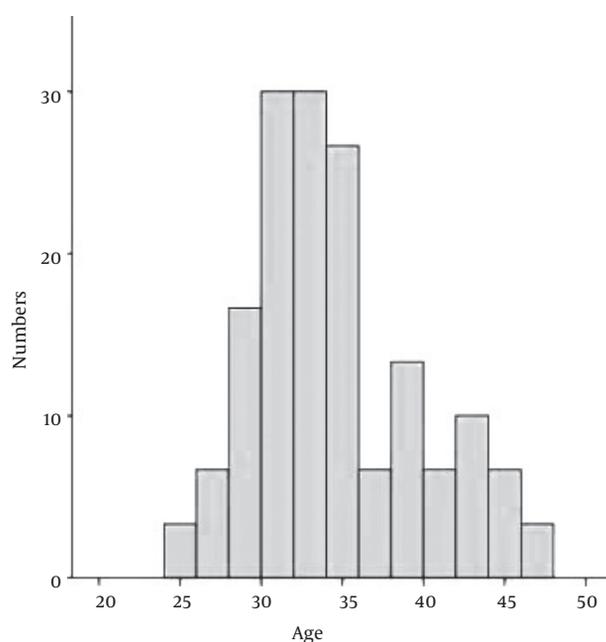


Figure 2. Age Distribution of Participants

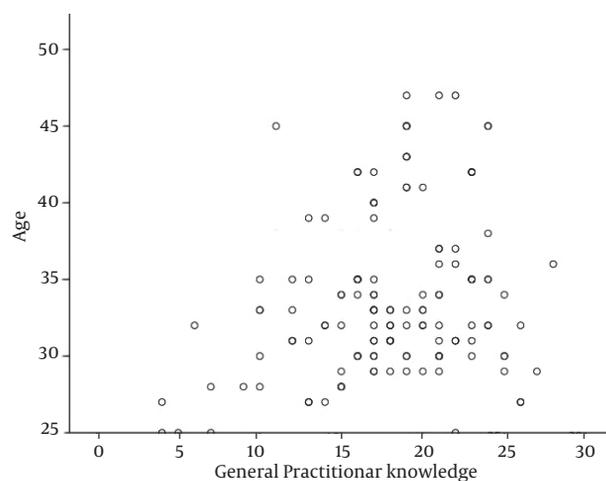


Figure 3. Knowledge Scores and Age of Participants

Males and females' awareness scores were 17.3 ± 5.3 and 18.7 ± 4.0 , respectively. Although the level of awareness in females was slightly higher, this difference was not statistically significant.

Average Knowledge score of general practitioners was 17.8 ± 4.0 , and the average work experience was 5.9 ± 4.4 years. Pearson correlation test showed 0.158 correlation coefficient between the 2 variables, which was not statistically significant ($P = 0.283$).

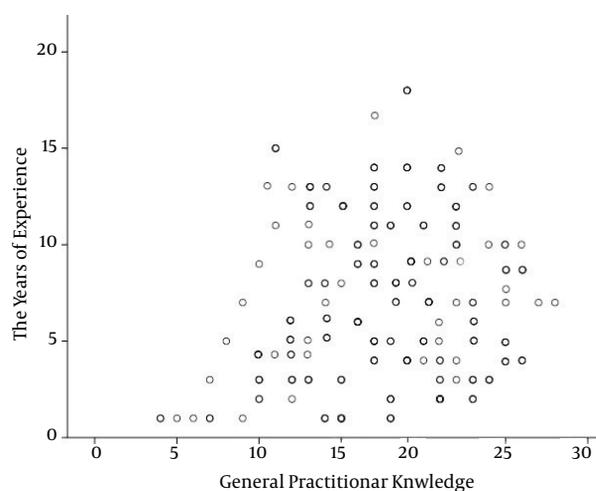


Figure 4. Knowledge Scores and Years of Work Experience of Participants

In this study, 163 (97%) of the participating physicians stated that they referred patients with gum disease to a dentist; of these referrals, 77 (47.2%) referrals were made according to the physicians' decision, 8 (4.9%) acted based on patient preference, and in 78 cases (47.9%) the physicians acted based on both (Table 1).

Only 21 (12.5%) physicians referred patients with cardiovascular problems to the dentists for consultation; 46 (27.4%) of the responders provided a correct answer about the role of periodontal bacteria in atherosclerotic diseases. However, it seemed that general practitioner's knowledge about the relationship between periodontal health and pregnancy outcomes and diabetes was higher, with 100% and 95.8% giving correct answers, respectively. 98% also referred pregnant patients to dentists this was 95.8% for diabetes patient (Table 1).

Physicians declared that the main source of their information was information they obtained from courses during their study years at university (85.1%). The next sources with highest percentages were reading other books and articles and dentists with 64.9% and 39.9%, respectively. Continuing education courses only had a negligible 1.8% contribution in gaining information regarding this topic (Table 2).

4. Discussion

It has become clear that the body's response to chronic infection of the periodontal structures can be a risk factor for many systemic conditions. These associations have been a vast and growing topic of research and many links between periodontal infection and systemic disor-

Table 2. Source of Information on the Relationship Between Periodontal and Systemic Diseases

The References	No. (%)
University courses	143 (85.1)
Books and scientific articles	109 (64.9)
Dentists	67 (39.9)
Internet	49 (29.2)
Media	11 (6.6)
Friends	4 (2.4)
Continuing education courses	3 (1.8)
Magazines	1 (0.6)

ders such as coronary heart disease, (angina, myocardial infarction, and atherosclerosis) stroke, diabetes, premature birth (newborns with low birth weight), hospital pneumonia, and osteoporosis have been clearly demonstrated. Precise treatment of periodontal diseases has also been found to have positive effects on the management of these systemic conditions (11, 13, 15-17).

Several studies have investigated the knowledge of different groups of health care professionals about the relationship between periodontal disease and systemic conditions. Some have only focused on the relationship between a specific systemic disease status and a group with a certain specialty (18-21).

In this study, we evaluated the knowledge and behavior of general physicians as the most important part of health care professionals dealing with many systemic conditions and diseases. Well-informed Physicians would probably have a great impact on general health of individuals by providing advice and referrals.

In our study, most physicians (163 persons) referred patients with gum disease to a dentist. In addition, the participants in this survey had a moderate level of knowledge about the signs and symptoms of periodontal disease and its links with systemic conditions (17.8 ± 4.8).

Nagarakanti et al. did a similar study in India in 2013, only 10% of all participants referred their patients to dentists, while this figure was 97% in our study, which might be due to the fact that our health care system has focused on preventive dental issues in pregnant women in the recent years (22).

Tasdemir et al. evaluated the knowledge of physicians in Turkey; according to their results, 56.5% of the medical doctors referred their patients to periodontists (19).

In 2013, Al-Zarea in Saudi Arabia evaluated awareness of 250 medical students about the relationship between periodontal disease and other systemic problems. The partici-

pants' awareness of the causes, signs, symptoms, and preventive measures against gum disease was poor. A statistically significant association was found between the awareness of the symptoms of periodontal disease and preventative measures against systemic diseases (23).

Gur and Majra in 2011 evaluated 143 intern's awareness about the systemic effects of periodontal disease. Awareness was very poor in 42% of them, 47% had poor, and 11% had good knowledge. Less than 20% of the participants knew about the relationship between periodontal disease and cardiovascular disease, CVA, diabetes, pneumonia, and premature infants. As a result, medical physicians did not have sufficient knowledge about the systemic effects of periodontal disease. Therefore, medical and dental training was recommended (13).

In our study, knowledge about the relationship between periodontal disease and cardiovascular disease and the referral of patients with cardiovascular disease to the dentist was 12.5%, which is lower than the study by Gur, but referral of pregnant women (100%) and diabetic patients (95.8%) was much higher than the mentioned studies (20%).

In 2011, Al-Khabbaz et al. in Kuwait evaluated the knowledge of physicians and dentists about the relationship between periodontal disease and diabetes mellitus; 510 health professionals (232 doctors and 278 dentists) participated in the study. Dentists were reported to be more aware about periodontal disease than physicians. Regression analysis revealed that awareness about the relationship of periodontal disease and diabetes mellitus in participants with older age, female gender, and dentistry profession was greater. As a result, knowledge of physicians and dentists should be increased to effectively control and treat diabetes and periodontal disease (15).

In our study, no relationship was found between age and experience with awareness and although women are more informed than men, there was no statistically significant difference.

We found the lowest referral and knowledge to be associated with the relationship between cardiovascular diseases and periodontal disease. Interestingly in a recent study on the knowledge and practice behavior of North Carolina Cardiologists on this topic, most cardiologists surveyed were unclear about the etiology of periodontal disease and wanted to have more information about the potential oral-systemic link regarding cardiovascular disease (18).

In a study by Owens et al., the knowledge and practice behaviors of North Carolina's internists and endocrinologists, who treated patients with any type of diabetes, was evaluated; and similar to our study, their findings on knowledge about periodontal disease and its links with di-

abetes was high. However, their referral rate to dentists was reported to be 48%, which was much lower than our study (95.8%). In the study by Tasdemir et al. the rate of knowledge about the association between periodontal disease and diabetes mellitus was 66.8%; this was 42.2% in the study of Al-Khabbaz et al. which was also performed on general physicians, these were also lower than our results (15, 19).

In another study, Wilder et al. investigated the information of 194 gynecologists about periodontal disease and its association with preterm delivery and low birth weight babies. The most correct answers were on knowledge about gingivitis (95%), and 67% of respondents correctly described periodontitis. Most respondents (84%) imagined periodontal disease as a risk factor for pregnancy (16). In our study, the participants had better knowledge, and this item was 100%, and all participants were aware of the relationship between periodontal and pregnancy outcomes and 98% referred pregnant patients to dentists. In similar study by Al-Habashneh et al. on medical doctors' knowledge, only half (54%) of the physicians thought that tooth and gums problem can affect the outcomes of pregnancy. As we mentioned, this is probably due to the great emphasis of the health system in Iran on dental and periodontal treatment of schoolchildren and pregnant women in a national dental prevention plan (24).

It might also be because university courses in Iran cover these areas better because our participants also reported to have obtained most of their information from university courses (85.1%). In the study on a similar population of medical doctors in Turkey, they also reported obtaining their information about the relationship of periodontal disease and systemic health, primarily from classes and workshops (19). Findings by Al-Habashneh et al. showed that the responders obtained the same information, primarily from magazines (24). In contrast, magazines had the lowest percentage in our study. In the study on internists and endocrinologists by Owens et al. only 24% reported not having any oral health information in their educational curricula (21).

According to our findings, the physicians showed a fair level of knowledge, referral, and consultation with dental professionals. Our university curriculums seemed to cover this interprofessional field of education. However, with the rapidly changing and growing information in this important topic of periodontal medicine, it still seems necessary to increase courses provided on this topic to keep our health care professionals up-to-date after graduation from universities. Moreover, we should provide them with more information to empower them to perform oral examinations and collaborate with dental professionals for offering better patient care.

Conclusions

The results of this study revealed a moderate level of knowledge of general practitioners about the relationship between periodontal diseases and systemic disease. With the rapidly growing field of periodontal medicine, oral health related training should be an integral part of continuing education courses after graduation to increase collaboration of medical and dental health care professionals and help prevent the negative outcomes of periodontal diseases on systemic health of patients.

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