

Dental Communication

Awareness and Knowledge of Oral Diseases Associated with Rheumatic Patients Among Dentists in Saudi Arabia

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ABSTRACT

Rheumatic diseases are autoimmune and inflammatory conditions that make the immune system attack the body's joints, muscles, bones, and organs. Oral health is proven to be associated with overall systemic health. Patients with rheumatic diseases present with multiple oral manifestations that might be the first clinical signs and symptoms of a systemic disease. The aim of this study was to assess the awareness and knowledge of dentists of the oral diseases associated with rheumatic patients in Saudi Arabia. A self-administered questionnaire was distributed aimed at the different specialties and degrees of dentistry. The total number of participants in this study was 235. The majority of participants (68.1%) agreed that there is a relationship between oral health and rheumatic disease, but only 31.1% agreed (or strongly agreed) that they have sufficient information about this association. Additionally, 34.9% agreed that there was enough information about medications that can be used in rheumatic patients and their possible side effects on the oral cavity. Almost half of the participants (46.8%) disagreed that rheumatic disease lecture(s) that have been covered at the undergraduate and postgraduate levels, enough to manage rheumatic patients. The majority (64.7%) never attended any form of continuous education lecture(s) or course(s) regarding the management of oral conditions in rheumatic patients. We concluded that most of the participants agreed that there is a relation between oral health and rheumatic diseases. At the same time, they think that they do not have enough information on the association between oral health and rheumatic diseases. This is in addition to information on the medication used in rheumatic patients and their possible side effects in the oral cavity.

KEY WORDS: ORAL HEALTH, RHEUMATIC DISEASES; SYSTEMIC HEALTH.

INTRODUCTION

Rheumatic diseases are autoimmune and inflammatory conditions that cause the immune system to attack the joints, muscles, bones, and organs of the body. Patients with rheumatic diseases present with multiple oral manifestations that might be the first clinical signs and symptoms of a systemic disease. The main oral manifestations of rheumatic diseases are xerostomia, temporomandibular joint disorders, periodontal diseases, and dysphagia (Gualtierotti et al. 2018). The link between oral and systemic diseases is well documented in the dental and medical literature. In (2001),

Mercado (2000) concluded that there is good evidence of an association between rheumatoid arthritis and periodontal diseases (Mercado et al. 2000; Rodríguez-Lozano et al. 2019). Another study demonstrated that periodontitis is associated with an increased risk of developing RA. A study conducted by Chamani (2017) concluded that 51% of rheumatoid arthritis patients have complained of xerostomia. A significant relationship was also found between xerostomia and oral health-related quality of life (Chamani et al. 2017; Choi and Lee 2021).

In response, a better understanding of dentists of this oral and systemic link would help to educate patients to help them improve their oral and general healthcare. In addition, this would also lead to improving the collaboration between dentists and other health care professionals (Chamani

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et al. 2017). Many of the dentists who participated in Nazir's study believed that the patients' awareness of the link between oral and systemic health could increase the number of patients seeking dental care (Nazir et al. 2019). The available literature shows an association between oral diseases and systemic diseases. However, only a few studies have been done on the dentist's awareness of this association, particularly rheumatoid diseases. As mentioned previously, the understanding of this association could be significant for better oral health outcomes among rheumatic patients. A cross-sectional study was conducted by Al Sharrad that assessed the awareness of the relationship between systemic and periodontal diseases among dentists and physicians in the Kingdom of Saudi Arabia and the state of Kuwait. The study sample included a convenient sample of two groups of selected physicians and dentists in Saudi Arabia and Kuwait (Nazir et al. 2019).

Group 1 was comprised of intern physicians, family/internal medicine specialists and other specialists while group 2 consisted of intern dentists, general dental practitioners, periodontists, and other dental specialists. The sample size for the dentists was 484 and for physicians, it was 134. They concluded that the level of awareness is generally low (Sharrad et al. 2019). It has been shown that the attitude and practices of dentists and physicians will determine the advice that they offer to their patients (Merchant et al. 2002). A survey of dentists in the United States found that their awareness of the association between oral and general health can encourage patients to seek out oral care in a dental practice (Song et al. 2013; Sharrad et al. 2019).

A study done by Bhatia showed that almost two thirds of the population in their study were unaware about the oral-systemic diseases link. This emphasized the need for dentists to educate their patients about the oral diseases related to systemic diseases (Hemalatha et al. 2020). This was a cross-sectional study. Another study published in 2001 by Morgan found that the majority of hospital doctors believed that it was important to examine the patient's mouth. However, most of them (77.0%) did not feel that they had sufficient training or enough confidence to examine an oral cavity (Morgan et al. 2001; Hemalatha et al. 2020). The aim of this study is to report on the dentists' awareness and knowledge of the oral diseases associated with rheumatic patients.

MATERIAL AND METHODS

This study's subjects consisted of dentists in Saudi Arabia. Informed consent from the participants was obtained. The participants were informed that their responses and personal information would be kept confidential. A cross-sectional survey was prepared in the English language using Google Forms. The survey was distributed among the selected sample of dentists in Saudi Arabia. The questionnaire was designed based on an established Likert scale to assess agreement. Yes/No questions were also used as part of the assessment. The questionnaire included four questions about the demographic data of the participants: age, gender, specialty, and job title. This was followed by general short questions that were used to assess their agreement or

disagreement regarding the relationship between oral health and rheumatoid diseases. After that, another question was used to assess their knowledge and if they have adequate enough information or not regarding the association between oral health and rheumatoid diseases. This includes whether they can identify the oral signs and symptoms of rheumatoid diseases in their patients and the possible side effects on the oral cavity due to the drugs used to treat rheumatoid diseases.

Furthermore, there were additional questions regarding whether they had experience of cases where they saw an oral manifestation in rheumatic patients, and whether will they consult with a rheumatologist when they suspect oral findings that might be related to rheumatoid diseases. Two general questions were about whether rheumatic patient should be routinely referred to specialized dental clinics for an oral examination or not. The other question assessed their level of agreement or disagreement regarding whether oral diseases, when associated with rheumatic patients, can negatively affect their quality of life. In addition, there was a question about the management of oral conditions.

Another question was on whether the rheumatoid disease lectures at the undergraduate and postgraduate levels are enough to manage rheumatic patients. The last question was about how often dentists attend continuous education regarding the management of oral conditions in rheumatic patients. The survey was prepared using an online form and it was distributed among a sample of dentists in Saudi Arabia. For statistical analysis, the values were presented as numbers and percentage. The Chi square test was used to compare the categories of participants based on gender, age group, and job title. The significance level was set at $p \leq 0.05$. Statistical analysis was performed using SPSS 23.0 (Statistical Package for Scientific Studies, SPSS, Inc., Chicago, IL, USA) for Windows. Microsoft Excel was used to generate the representative graphs.

RESULTS AND DISCUSSION

The total number of participants in this study was 235. More than half of them were male totaling 143 (60.9%) while 92 (39.1%) were females. For the age of the participants, those aged 20 - 30 years totaled 172 (73.2%), 31 - 40 years totaled 43 (18.3%), 41 - 50 years totaled 15 (6.4%), and those above 50 years old totaled 5 (2.1%). More than half of the participants were general dentists totaling 137 (58.3%), followed by oral medicine specialists totaling 23 (9.8%), orthodontists totaling 19 (8.1%), and restorative endodontists totaling 11 (4.7%).

Pedodontists and prosthodontists had the same number of participants totaling 6 (2.6%), while oral surgeons and periodontists also had the same number of participants totaling 3 (1.3%). Other roles totaled 27 (11.5%). The majority of participants (68.1%) agreed (or strongly agreed) that there is a relationship between oral health and rheumatic disease, but only 31.1% agreed (or strongly agreed) that they have sufficient information about this association. Additionally, 34.9% agreed (or strongly agreed) that the sufficient information about the medications that could

be used to treat rheumatic patients and their possible side effects on the oral cavity. Almost half of the participants (48.5%) didn't see any patients with oral manifestations due to rheumatic disease. The majority (77.5%) agreed (or strongly agreed) with the need to consult a rheumatologist when they suspected oral findings in the patients that might be related to rheumatic diseases and 60.4% agreed (or strongly agreed) that patients with rheumatic disease should be routinely referred to a specialized dental clinic.

The majority (66%) agreed (or strongly agreed) that oral manifestations associated with rheumatic patients could negatively affect their quality of life. The majority (88.6%) agreed (or strongly agreed) that the best action to manage oral conditions in rheumatic patients was to refer them to an oral medicine clinic or to treat the patients in the GP clinic as part of a physician's consultation. Almost half of the participants (46.8%) disagreed (or strongly disagreed) that rheumatic disease lecture(s) were covered at the undergraduate and postgraduate levels enough to manage rheumatic patients. The majority (64.7%) had never attended any continuous education lecture(s)/course(s) regarding the management of oral conditions in rheumatic patients.

A significantly higher percentage of females agreed (or strongly agreed) that there is a relationship between oral health and rheumatic disease ($p=0.019$). A significantly higher percentage of females also agreed (or strongly agreed) that they have sufficient information about this association ($p=0.045$) and that they had sufficient information about the medications that can be used to treat rheumatic patients and their possible side effects on the oral cavity ($p=0.020$). A significantly higher percentage of females have seen rheumatic patients with an oral manifestation (31.5%), in comparison to 10.5% of males ($p=0.019$). A significantly higher percentage of females agreed (or strongly agreed) that patients with a rheumatic disease should be routinely referred to a specialized dental clinic for an oral examination. ($p=0.00$). The oral manifestations associated with rheumatic patients could negatively affect their quality of life ($p=0.00$). There was no statistically significant difference found between the participants in the rest of the questionnaire.

A significantly higher percentage of participants in the 41 - 50 year age group agreed (or strongly agreed) that there is a relationship between oral health and rheumatic disease ($p=0.002$). A significantly higher percentage of participants in the same age group (41 - 50 years) also agreed (or strongly agreed) that they have sufficient information about this association ($p=0.00$) and that they had sufficient information about the medications that can be used to treat rheumatic patients and their possible side effects on the oral cavity ($p=0.002$).

A significantly higher percentage of participants in the 41 - 50-year age group have seen rheumatic patients with an oral manifestation (60%), in comparison to 40% and 39.5% of the participants above 50 years or in the 31 - 40-year age group respectively. Only 9.3% of the participants in the 20 - 30-year age group have seen rheumatic patients with an oral manifestation ($p=0.000$). A significantly higher percentage

of participants in the 31 - 40-year-old age group agreed (or strongly agreed) that oral manifestations associated with rheumatic patients could negatively affect their quality of life ($p=0.004$).

A significantly higher percentage of participants (80%) in the 41 - 50-year-old age group considered the best action to manage oral conditions in rheumatic patients to be to refer to an oral medicine clinic. In addition, 50% of participants in the 20 - 30-year-old age group chose to treat patient in the general practitioner clinic following a physician's consultation. There was a statistically significant difference between the age group responses to this question ($p=0.007$). A significantly higher percentage of participants in the 41 - 50 years age group attended 2 to more than 10 continuous education lecture(s)/course(s) regarding the management of oral conditions in rheumatic patients (53.3%), in comparison to 20% and 30.3% of participants above 50 years or in the 31 - 40-year-old age group respectively. Only 17.4% of participants in the 20 - 30-year-old age group had attended 2 or more courses ($p=0.023$). There were no statistically significant differences between the participants in the rest of the questionnaire.

A significantly higher percentage of general dentists disagreed (or strongly disagreed) that there is a relationship between oral health and rheumatic disease ($p=0.00$). A significantly higher percentage (60%) of university professors agreed (or strongly agreed) that they have sufficient information about this association ($p=0.00$), and that they had sufficient information about the medications that can be used by rheumatic patients and their possible side effects on the oral cavity ($p=0.001$). A significantly higher percentage (42.9%) of university professors have seen rheumatic patients with an oral manifestation. This is in comparison to 4.8%, 12.7% and 16.7% of interns, general dentists, and postgraduate students respectively ($p=0.000$). A significantly higher percentage of (91.5%) of university professors agreed (or strongly agreed) that oral manifestations associated with rheumatic patients could negatively affect their quality of life ($p=0.00$).

A significantly higher percentage of university professors (62.9%) considered that the best action to manage oral conditions in rheumatic patients was to refer to an oral medicine clinic, while 60.6% of general dentists chose to treat their patients in the general practitioners' clinic as part of a physician consultation. There was a statistically significant difference in the participants' response to this question ($p=0.003$). A significantly higher percentage of general dentists have never attended or attended only once a continuous education lecture(s)/course(s) regarding the management of oral conditions in rheumatic patients with an oral manifestation (91.6%), in comparison to 76.2%, 72.3% and 65.7% of interns, general dentists and postgraduate students respectively ($p=0.002$). There was no statistically significant difference between the participants in the rest of the questionnaire (Table 1a, 1b, and 1c).

Rheumatoid arthritis is a chronic autoimmune inflammatory disease affecting the synovial membrane of diarthrodial joints. Systemic weight loss, fever, and fatigue may be

among the first presentations of RA. The classic features of this disease are chronic, bilateral, and symmetric polyarthritis, joint pain, and inflammation that can result in deformity, instability, and the destruction of synovial joints (Abrão et al. 2016). Temporomandibular joint (TMJ) involvement occurs in about 50% of RA patients. This can occur at an early age, and it may result in mandibular

growth disturbance, facial deformity, bilateral and unilateral TMJ ankylosis, a retrognathic mandible, and malocclusion giving a typical bird facies appearance (Voog et al. 2003; Grover et al. 2011). A recent study reported that in patients with RA, the predominant finding was the erosion of the condyle (85%) followed by condylar sclerosis (Voog et al. 2003; Choi and Lee 2021).

Table 1 a. Comparison of knowledge among study participants to various questions according to Job title (Question 5-8)

Questions	Responses	Job title								χ ²	value
		intern		General dentist		postgraduate student		university professor			
		n	%	n	%	n	%	n	%		
Q5-Relationship between oral health & rheumatic disease?	Strongly agree	10	11.9%	12	16.9%	5	27.8%	20	57.1%	42.61	0.00*
	Agree	38	45.2%	36	50.7%	7	38.9%	10	28.6%		
	Neutral	31	36.9%	16	22.5%	5	27.8%	4	11.4%		
	Disagree	5	6.0%	5	7.0%	1	5.6%	1	2.9%		
	Strongly Disagree	0	0.0%	2	2.8%	0	0.0%	0	0.0%		
Q6- Information about the association between oral health & rheumatic diseases?	Strongly agree	3	3.6%	1	1.4%	1	5.6%	14	40.0%	63.34	0.00*
	Agree	23	27.4%	10	14.1%	2	11.1%	7	20.0%		
	Neutral	31	36.9%	29	40.8%	9	50.0%	7	20.0%		
	Disagree	25	29.8%	22	31.0%	4	22.2%	7	20.0%		
	Strongly Disagree	2	2.4%	9	12.7%	2	11.1%	0	0.0%		
Q7- Information about medications used in Rheumatic patients and their side effect on the oral cavity?	Strongly agree	3	3.6%	4	5.6%	0	0.0%	10	28.6%	41.18	0.001*
	Agree	27	32.1%	16	22.5%	3	16.7%	5	14.3%		
	Neutral	27	32.1%	24	33.8%	7	38.9%	13	37.1%		
	Disagree	25	29.8%	19	26.8%	5	27.8%	5	14.3%		
	Strongly Disagree	2	2.4%	8	11.3%	3	16.7%	2	5.7%		
Q8- Have you seen patients with oral manifestations of the rheumatic diseases?	Yes, patients with oral manifest.	4	4.8%	9	12.7%	3	16.7%	15	42.9%	55.81	0.00*
	Yes, patients with no oral manifest	18	21.4%	9	12.7%	1	5.6%	5	14.3%		
	Don't know	10	11.9%	19	26.8%	5	27.8%	2	5.7%		
	No	52	61.9%	33	46.5%	9	50.0%	13	37.1%		
	other	0	0.0%	1	1.4%	0	0.0%	0	0.0%		

Significance level p<0.05, *significant, ns=non-significant

Table 1 b. Comparison of knowledge among study participants to various questions according to Job title (Question 9-11)

Questions	Responses	Job title								χ ²	P value
		intern		General dentist		Postgraduate student		university professor			
		n	%	n	%	n	%	n	%		
Q9- Will you consult a rheumatologist when you suspect oral findings in patients that might be related to rheumatic diseases?	Strongly agree	30	35.7%	19	26.8%	7	38.9%	18	51.4%	16.34	0.430 ns
	Agree	40	47.6%	30	42.3%	6	33.3%	12	34.3%		
	Neutral	9	10.7%	13	18.3%	4	22.2%	5	14.3%		
	Disagree	4	4.8%	7	9.9%	1	5.6%	0	0.0%		
	Strongly Disagree	1	1.2%	2	2.8%	0	0.0%	0	0.0%		
Q10- Patients with Rheumatic disease should be routinely referred to specialized dental clinic for oral examination.	Strongly agree	15	17.9%	13	18.3%	3	16.7%	14	40.0%	21.07	0.176 ns
	Agree	32	38.1%	24	33.8%	10	55.6%	14	40.0%		
	Neutral	29	34.5%	22	31.0%	5	27.8%	6	17.1%		
	Disagree	8	9.5%	11	15.5%	0	0.0%	1	2.9%		
	Strongly Disagree	0	0.0%	1	1.4%	0	0.0%	0	0.0%		
Q11- Oral manifestations associated with rheumatic patients could negatively affect their quality of life?	Strongly agree	13	15.5%	9	12.7%	2	11.1%	15	42.9%	42.48	0.00*
	Agree	39	46.4%	30	42.3%	11	61.1%	17	48.6%		
	Neutral	27	32.1%	21	29.6%	5	27.8%	3	8.5%		
	Disagree	4	4.8%	10	14.1%	0	0.0%	0	0.0%		
	Strongly Disagree	1	1.2%	1	1.4%	0	0.0%	0	0.0%		

Significance level p<0.05, *significant, ns=non-significant

Table 1 c. Comparison of knowledge among study participants to various questions according to Job title (Question 12-14)

Questions	Responses	Job title								χ^2	P value
		Intern		General dentist		Postgrad. student		university professor			
		n	%	n	%	n	%	n	%		
Q12- What do you think the best action to manage oral condition in rheumatic patients?	Refuse to see patients in GP clinic	4	4.8%	2	2.8%	1	5.6%	0	0.0%	36.04	0.003*
	Refuse to refer patients to specialty clinic	4	4.8%	1	1.4%	0	0.0%	2	5.7%		
	Treat patient in GP clinic under physician consultation	37	44.0%	43	60.6%	8	44.4%	8	22.9%		
	Refer to Oral and Maxillofacial surgery clinic	2	2.4%	5	7.0%	1	5.6%	3	8.6%		
	Refer to Oral Medicine clinic	37	44.0%	20	28.2%	8	44.4%	22	62.9%		
Q13- Do you think rheumatic diseases lecture(s) covered during undergraduate/postgraduate level enough to manage rheumatic patients?	Strongly agree	5	6.0%	5	7.0%	0	0.0%	0	0.0%	20.83	0.185 ns
	Agree	11	13.1%	9	12.7%	2	11.1%	5	14.3%		
	Neutral	36	42.9%	21	29.6%	9	50.0%	11	31.4%		
	Disagree	28	33.3%	27	38.0%	4	22.2%	19	54.3%		
	Strongly Disagree	4	4.8%	9	12.7%	3	16.7%	0	0.0%		
Q14- Did you attend any continuous education lecture(s)/course(s) regarding management of oral conditions in rheumatic patients?	Never	52	61.9%	57	80.3%	10	55.6%	16	45.7%	37.07	0.002*
	Once only	12	14.3%	8	11.3%	3	16.7%	7	20.0%		
	2-4 lectures/courses	17	20.2%	5	7.0%	5	27.8%	9	25.7%		
	5-9 lectures/courses	2	2.4%	1	1.4%	0	0.0%	1	2.9%		
	More than 10 lectures/courses	1	1.2%	0	0.0%	0	0.0%	2	5.7%		

Significance level $p \leq 0.05$, *significant, ns=non-significant

Patients with long-standing active RA may have an increased incidence of periodontal disease, including an increase in pocket depth, furcation involvement, and a loss of the alveolar bone and teeth. It is necessary for the dentist to have an awareness of the patient's current RA medication. It is possible that there may be side effects and interactions with other drugs. Before recommending any additional NSAIDs, the clinician must assess the patient's current medication schedule to avoid renal or gastric toxicity. Gastrointestinal-protective agents such as misoprostol may help to reduce these side effects. Replacement therapy is essential in patients who engage in the long-term use of glucocorticoids to prevent secondary adrenal insufficiency.

In patients with severe RA who have had any of their joints surgically replaced with prosthetic joints, they may require prophylactic antibiotic therapy before undergoing any invasive dental procedures (Grover et al. 2011; Li et al. 2017; Pandey et al. 2018). In a previous qualitative study, the dentists suggested taking care of the oral and general health of patients as primary care providers. Some strongly believed that the patient's education on the oral-systemic link is crucial to the provision of optimal dental care (Song et al. 2013; Nazir et al. 2019).

This study was conducted to assess the dentists' awareness and knowledge of the oral diseases associated with rheumatic patients in Saudi Arabia. In the case of the present study, 160 (68.1%) of participants agreed that in general, there is a relationship between oral health and rheumatic disease. On the other hand, 79 (33.7%) participants disagreed that they have sufficient information about the association between oral health and rheumatic diseases, in addition

to the medications that can be used to treat rheumatic patients and their possible side effects on the oral cavity. This is mostly because the rheumatic disease lectures that have been covered at the undergraduate and postgraduate levels are not enough to manage rheumatic patients. Most of them did not attend any continuous education lectures or courses regarding the management of oral conditions in rheumatic patients.

According to Nazir et al., improving the level of awareness and updating the knowledge of medical professionals can be achieved through a review of the curricula in medical and dental schools in relation to conducting continuous educational programs (Nazir et al. 2019; Choi and Lee 2021). Song et al. (2013) mentioned that when established guidelines do not exist for treating dental patients with additional medical conditions, especially for those with less studied diseases, the dentists in their study took actions based on their clinical experience in some cases.

They sought their colleagues' advice online for others (Song et al. 2013). According to the current study, 117 (48.5%) participants had not seen patients with oral manifestations of rheumatic diseases in their clinic. Additionally, 182 (77.5%) of participants intended to consult a rheumatologist when they suspect oral findings in their patients that might be related to rheumatic diseases. According to Nazir et al., their results confirm the need for effective communication between physicians and dentists by referring patients between the specialties as required (Nazir et al. 2019). In addition, 142 (60.4%) participants agreed that patients with rheumatic diseases should be routinely referred to specialized dental clinics for an oral examination. Additionally, 155 (66%) of

them agreed that the oral manifestations associated with rheumatic patients could negatively affect their quality of life. Referring the patient to an oral medicine clinic is what most of participants agreed on when managing select oral conditions in rheumatic patients. The agreed and strongly agreed responses were combined to describe the results (Choi and Lee 2021).

CONCLUSION

The finding of the present study showed, in the spite of the results, most of the respondents agreed that there is a relation between oral health and rheumatic diseases. At the same time, they think that they do not have sufficient information about the association between oral health and rheumatic diseases, in addition to the medication used in rheumatic patients and their possible side effects in relation to the oral cavity. In general, the awareness and level of knowledge are low, therefore rheumatic disease lectures should be covered well at both the undergraduate and postgraduate levels.

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