

# Dentists' awareness of physiotherapy role in the management of Temporomandibular disorders in Royal Medical Services

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## ABSTRACT

**Objectives:** The aim of this study is to assess the awareness of dentists in the Royal Medical Services (RMS) of the role of physiotherapy in temporomandibular disorders (TMD) management.

**Methods:** In this cross-sectional study, an online survey was adapted. A list of 400 dentists from all specialties in the RMS was obtained and those on the list were invited to complete the questionnaire. The dentists' responses were analysed using descriptive statistics and logistic regression.

**Results:** A total of 249 dentists completed the survey (43.8% were female and 56.2% were males). Most of the dentists reported that they usually refer their patients to an oral surgeon (70.7%) or to a prosthodontist (29.3%), while only 24.5% reported that they had referred patients directly to a physiotherapist. The most common methods of treatment reported by dentists were the prescription of medications (79.1%) and the prescription of splints or occlusal guards (79.1%). Many of the dentists (82.7%) reported that they referred their patients after the use of medication. Among those referred, reasons for referral included masticatory muscle tenderness (60.7%), neck pain (50.8%), cervicogenic headache (42.6%), and awkward posture (42.6%). After the survey, 61.4% of the dentists reported that they are more likely to refer patients with TMD to a physiotherapist. Longer years of experience as a dentist ( $\beta = .089$ ,  $p = .002$ ) and a specialty in oral surgery ( $\beta = 1.987$ ,  $p = .001$ ) were attributes associated with a higher likelihood of the dentist making a referral to physiotherapy.

**Conclusion:** This study demonstrated that the majority of dentists in the RMS are unaware about physical therapy role in the management of patients with TMD. The majority of dentists refer patients with TMD to another dental specialty, especially oral surgery. Awareness campaigns and training courses could encourage collaboration between dentists and other health care providers to improve the quality of care for patients with TMD.

**Keywords:** Awareness, Dentists, Management, Physiotherapy, Temporomandibular Joint disorder

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## INTRODUCTION

The temporomandibular joint (TMJ) is formed by the mandibular condyle connecting the mandibular fossa of the temporal bone. The muscles of mastication are primarily responsible for the movement of this joint.(1) Temporomandibular dysfunction (TMD) is a complicated and multifactorial condition that affects the TMJ and the muscles of mastication, resulting in pain and disability.(2) The most common symptoms of TMD are regional pain in the face and peri-auricular area, limitations in jaw movements, crepitus and clicking, and functional disability.(3)

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According to the National Institute of Health and Cranial Research, the prevalence of TMD in the population ranges from 5 to 12%.<sup>(2)</sup> The condition affects women more frequently than men and is most common among the 20–40 age group, decreasing in incidence with age.<sup>(3)</sup> In Jordan, TMD is highly prevalent among university students and schoolchildren.<sup>(4-6)</sup> Also, TMD symptoms has been reported in 26.7% of dental clinics patients in Northern Jordan.<sup>(7)</sup>

Evidence suggests that TMD is commonly associated with other head and neck region conditions, including cervical spine disorders and headaches. In addition, the presence of neck pain was shown to be associated with 70% of TMD cases.<sup>(8)</sup> This finding suggests the need for a multidisciplinary approach for the assessment and treatment of TMD.

The most common and most effective TMD treatment is the conservative one.<sup>(9)</sup> TMD treatment typically involves a multidisciplinary approach, including dentists, physicians, physiotherapists (PTs), speech pathologists, and psychologists.<sup>(10)</sup> This approach considers TMD-associated factors such as parafunctional habits, poor posture, widespread pain, poor sleep, and depression.<sup>(11)</sup> Therefore, a communication and collaboration system between different health care providers should be in place to provide high-quality health care services for patients with TMD.

Physiotherapy is increasingly recognized as an essential treatment because it has long been used for the treatment of musculoskeletal disorders, which can cause pain, muscle spasms and muscle weakness, and limit mobility.<sup>(12)</sup> Physiotherapy uses strengthening exercises, jaw movement correction, joint mobilization, and head and neck posture correction.<sup>(13)</sup> However, physiotherapy services are not adequately utilized due to the absence of a proper referral system for patients with TMD and a lack of awareness of physiotherapy services among dentists. Therefore, we aim to assess the awareness of dentists in the Royal Medical Services (RMS) about the role of physiotherapists in TMD treatment. We will also study dentists' management of TMD and their referral of individuals with the disorder to physiotherapy, as well as the factors associated with referring patients with TMD to physiotherapists.

## **MATERIALS AND METHODS**

The study employed a cross-sectional design using an online Google Forms questionnaire. The study was conducted between February and March 2021. Data were collected from a sample of dentists working in the Royal Medical Services in Jordan. A database of RMS dentists that contains the names and email addresses of 400 dentists was used to contact participants. A link to the survey was sent to participants by multiple means, and a reminder was resent after one week.

The design of the survey was adopted from previous publications (14, 15) and clinical experience. The clarity of the language, feasibility, readability, consistency of style, and the questionnaire's formatting was assessed qualitatively (using a focus group method) by the research team in a pilot study. The participants in the pilot study were six dentists from various specialties. Two participants suggested morphological changes to one of the questions to improve readability. The expert committee made the required changes, and the final questionnaire was approved with the consensus of the whole research team.

The survey consisted of two parts. The first part included general information about the dentists, including name, age, gender, main place of practice, years of dental experience, the highest degree of qualification, and TMD training courses undertaken. The second part was related to the population of patients with TMD and referrals. The online survey was estimated to take approximately 10–15 minutes to complete.

The survey was anonymous to maintain the confidentiality of data and privacy. The Institutional Review Board at the Royal Medical Services (#4/2021) provided the study's ethical approval. Consent form was

electronically distributed and obtained. Dentists who did not give consent were excluded from the study and were not able to complete the questionnaire. Only dentists currently working at RMS who have ever evaluated or treated a patient with TMD were included in the study.

Descriptive analysis was used to calculate means, standard deviation, and proportions. We used multivariable logistic regression (backward stepwise selection) to predict factors associated with higher odds for a referral to physiotherapy. The statistical level was set at ( $\alpha = 0.05$ ). IBM SPSS Statistics 25.0 (SPSS Inc. Chicago, IL) was used to conduct all statistical analyses.

## RESULTS

### 1.0 Dentists' characteristics

Table I shows the summary of the participants' characteristics and demographics. Nine dentists were excluded from the study because they had not evaluated or treated a case of TMD. A total of 249 dentists completed the survey (43.8% were female, and 56.2% were males). The mean age of the participants was  $33.22 \pm 6.05$  years with  $9.93 \pm 5.99$  years of experience. The majority (85.9%) of the participants were qualified from Jordanian academic institutions. According to the highest level of degree in dentistry completed, 52.6% of the dentists were holding Jordanian medical board 30.5% of the dentists were in the residency program, 1.2% had completed an academic master's degree, and 15.7% held a bachelor's degree as their highest qualification. Approximately one-third of the participants had undertaken continuous education courses in TMD after graduation (32.9%). The dentists were from various specialties, including conservative dentists, endodontists, orthodontists, prosthodontists, endodontists, oral surgeons, and periodontists, and only 10.0% were general dentists.

### 2.0 Dentists' treatment and referral of patients with TMD

**Table I.** Participants' demographic characteristics

		Frequency (%)
Age (years), mean (SD)		33.22 (6.05)
Experience (years), mean (SD)		9.93 (5.99)
Gender	Male	140 (56.2%)
	Female	109 (43.8%)
Country of the last degree obtained	Jordan	214 (85.9%)
	Other countries	35 (14.1%)
Highest level of dentistry degree completed	Bachelor's degree	39 (15.7%)
	Master's degree	3 (1.2%)
	Medical board	131 (52.6%)
	Residency	76 (30.5%)
Postgraduate Temporomandibular disorder course	Yes	82 (32.9%)
	No	167 (67.1%)
Area of practice	Conservative dentist	44 (17.7%)
	Pedodontist	36 (14.5%)

	Orthodontist	33 (13.3%)
	Prosthodontist	34 (13.7%)
	Endodontist	31 (12.4%)
	Oral surgeon	29 (11.6%)
	General dentist	25 (10.0%)
	Periodontist	17 (6.8%)

The most common methods of treatment reported were the prescription of medications (79.1%) and the prescription of splints or occlusal guards (79.1%) (Table II). Only 8.8% of the dentists reported that their patients totally improved after management. Whereas 90.0% reported that their patients partially improved and 1.2% that they did not consequently improve. Only 82.7% of the dentists reported that they referred their patients after the first line of management. The dentists vary in the percentage of patients referred to other practitioners: this percentage varied from no patients referred to all patients referred. Most dentists referred their patients to an oral surgeon (70.7%) or prosthodontist (29.3%).

Only 61 (24.5%) reported that they referred a patient to physiotherapy (Table II). Figure 1 shows the percentage of dentists who referred a patient with TMD to physiotherapy by dental specialty. The oral surgeons showed a higher trend than other specialties to refer patients with TMD to physiotherapy. Among those referred, reasons for referral included masticatory muscle tenderness (60.7%), neck pain (50.8%), cervicogenic headache (42.6%), awkward posture (42.6%), and that the patient did not get better after treatment (26.2%). Among those not referred, reasons for not referring them included the belief that the dentist is the only specialist able to treat TMD (13.8%), that there is no need for physiotherapy treatment (11.7%), and that they did not know about the benefit of physiotherapy for patients with TMD (74.5%). After the survey, 61.4% of the dentists reported that they are more likely to refer patients with TMD to a physiotherapist. The majority (98.4%) of the dentists are interested in learning more about the benefits of collaborating with physiotherapists to treat patients with TMD.

**Table II.** Dentists' TMD management practice pattern and referral (n = 249)

		N (%)
Methods of treatment commonly used by a dentist	Prescription of medications	197 (79.1%)
	Prescription of bite splints or occlusal guards	197 (79.1%)
	Occlusion correction/braces	67 (26.9%)
	Injection	38 (15.3%)
	Surgery	12 (4.8%)
Improvement after the first line of management	Totally improved	22 (8.8%)
	Partially improved	224 (90.0%)
	Did not improve	3 (1.2%)
Referral after the first line of treatment if partial or no improvement	Yes	205 (82.3%)
	No	44 (17.7%)
Percentage of patients with TMD usually referred	0%	44 (17.7%)
	1–5%	58 (23.3%)
	6–25%	61 (24.5%)
	26–50%	35 (14.1%)
	51–75%	29 (11.6%)
	76–100%	22 (8.8%)
Referral to other health care professionals	Oral surgeon	176 (70.7%)
	Prosthodontist	73 (29.3%)
	Orthodontist	25 (10.0%)
	Other dental specialties	10 (4.0%)
	Physiotherapist	61 (24.5%)
	Physician	4 (1.6%)

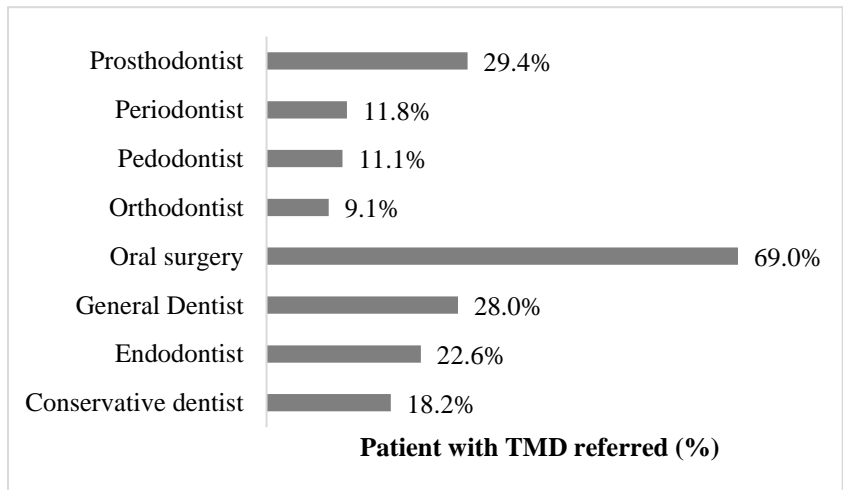
	Psychologist	26 (10.4%)
	Speech pathologist	1 (0.4%)
	Occupational therapist	1 (0.4%)
	Does not refer	45 (18.1%)
Reasons for physiotherapy referral (n = 61)	Masticatory muscle tenderness	37 (60.7%)
	Neck pain	31 (50.8%)
	Cervicogenic headaches	26 (42.6%)
	Awkward posture	26 (42.6%)
	Patient did not get better after treatment	16 (26.2%)
Reasons for not referring a patient with TMD to physiotherapy (n = 188)	Dentist is the only specialist to treat TMD	26 (13.8%)
	No need for physiotherapy treatment	22 (11.7%)
	Did not know about the benefit of physiotherapy for patients with TMD	140 (74.5%)
More likely to refer a patient with TMD to a physiotherapist after the survey?	Yes	153 (61.4%)
	Maybe	92 (36.9%)
	No	4 (1.6%)
Interested in learning more about the benefits of collaborating with physiotherapists to treat TMD patients?	Yes	245 (98.4%)
	No	4 (1.6%)

Multivariable logistic regression model results (see Table III) showed longer years of experience (OR 1.093 [95% CI 1.033-1.157];  $p = .002$ ), and specialty in oral surgery (OR 7.297 [95% CI 2.336-22.796];  $p = .001$ ) were the only significant predictors of referral to physiotherapy. Nagelkerk's  $R^2$  was .260, and Hosmer-Lemeshow goodness-of-fit test was not significant [ $\chi^2 (8) = 10.175, p = .253$ ], indicating the good fit of the model.

**Table III.** Binary logistic regression analysis for factors associated with referral to physiotherapy

	Odds Ratio (OR)	95% Confidence Interval	P-Value
Experience	1.093	1.033 – 1.157	.002
Oral surgery specialty	7.297	2.336 – 22.796	.001

**Figure 1.** Percentage of patients with TMD referred to physiotherapy by each dental specialty



## DISCUSSION

TMD is a group of conditions affecting the musculoskeletal and neurological components of the temporomandibular joint.(1) TMD is diagnosed based on patients' history, physical examination, and medical imaging, including panoramic radiography, computerized tomography, and magnetic resonance imaging.(16) There are many factors associated with the development of the TMD, including biological, environmental, social, emotional, and cognitive triggers.(1, 17)(18) Therefore, current evidence-based management suggests shifting TMD management from biomedical model to biopsychosocial model. The biopsychosocial model suggests integrating structural impairment, pain neuroscience, psychological factors, and social factors in the assessment and treatment of TMD.(19) Therefore, a multidisciplinary approach is recommended to better treatment of TMD, including dentists, physicians, psychologists, physiotherapists, and other health care practitioners.(20) Therefore, TMD treatment is a client centered, and a wide range of surgical and non-surgical management (medications, occlusal appliances, physiotherapy, behavioural therapy, and patient education) can be used based on patient assessment.(1, 21, 22)

This study evaluated the awareness of dentists in the Royal Medical Services (RMS), their management of TMD, and their referral to physiotherapy and other health care providers. Our results showed that the prescription of medications and splints are common treatment methods among dentists in TMD management. The majority of the dentists refer the patients mostly to another dental specialty. Only a quarter of the dentists refer the patient to physiotherapy, mostly for muscle tenderness and neck pain. Increased years of experience and being an oral surgery specialist increased the odds of referring patients to physiotherapy. The majority of the dentists were not aware of the benefits of physiotherapy for patients with TMD. After the survey, their awareness of the benefits of physiotherapy for TMD increased. The majority of the dentists (98.4%) who participated in the survey are interested in learning more about the benefits of collaborating with physiotherapists to treat patients with TMD. This study included convenient sample of dentists to estimate the current level of awareness of physiotherapy services among dentists. The indirect goal of the study was to design means to improve the collaboration and coordination between PTs and dentists to provide higher quality services to patients with TMD.

The results of our study agreed with the results of a study done by Gadotti et al. (2017) who screened dentists in Florida to examine their awareness of the importance of physiotherapy's role in TMD management(14) and reported that, the prescription of medications (62% vs. 79.1% in our study) and splints (90% vs. 79.1% in our study) were the most common treatment among dentists. Their study also showed that 62% of the dentists screened refer patients to an oral surgeon, which is quite similar to our findings (69%). A comparable percentage of dentists also refer patients to physiotherapy (31%), while our study found 24.5%. However, in their study, dentists' most common reason for physiotherapy referral was neck pain (43%), then masticatory muscle tenderness (34%), while in our study, masticatory muscle tenderness was the most common reason (60.7%), followed by neck pain (50.8%). Silveira et al. (2014, 2015) reported a strong correlation between jaw dysfunction and neck disability.(8, 23) In addition, they reported that the higher the level of muscle tenderness, the greater the level of jaw and neck pain. In fact, neck pain is present in 70% of patients with TMD, and there is well defined association between masticatory muscle and neck region.(8) For this reason, dentists must be aware of the importance of assessing the masticatory muscles and neck regions and refer patients for possible treatment options. Of the 188 participants who had never referred a patient with TMD to a PT, 140 of them (74.5%) were not aware of the benefits of physiotherapy for patients with TMD. Therefore, more referrals to PTs can be achieved if more dentists are aware of the benefit of PTs in TMD management. After the survey, 61.4% of dentists reported that they are more likely to refer a patient with TMD to a PT. However, 36.9% of dentists reported that they only might refer patients with TMD to a PT. This

indicates that not all dentists are encouraged to refer a patient to a PT even after the study raised their awareness of physiotherapy's advantages. A possible explanation is the lack of available trained physical therapists who have advanced education in TMD management.

Many conservative treatment modalities are effective in the TMD management. These therapies include occlusal orthotic and medications, which is usually prescribed by dentists.(11, 24) Physiotherapy uses many modalities that can improve pain and jaw function, including manual therapy, exercises, neuromuscular education, biofeedback, acupuncture, and laser therapy.(11, 25) The use of each modality should be based on examination and clinical reasoning to better management.

Shaheen et al. (2020) screened Saudi dentists to assess dentists' awareness and readiness to collaborate with PTs.(15) As in our study, only 29% of the dentists refer patients to PTs (24.5% in our study). However, in their study, upon completing the survey, almost all dentists (97.5%) were likely to refer patients with TMD to a PT, in comparison to 61.4% of the dentists in our study who reported that they are more likely to refer patients with TMD to a physiotherapist. In their study, a comparable percentage of dentists showed interest in collaborating with PTs (90.7%), while the percentage in our study was 98.4%. The variation in the results could be due to the difference in the medical system and practice, however, both studies showed there is readiness to refer and collaborate with PTs with more orientation.

Although 70.7% of the dentists referred TMD patients to oral surgeons, oral surgeons had the highest rate of referral to PTs among the dental specialties. This study showed that if other dental specialties refer patients directly to physiotherapy, this will save patients' time and facilitate providing services on time without referral to an oral surgeon. An oral surgeon might prefer using the conservative management provided by physiotherapy with surgery to be used as a last resort.(11, 14)

Dalanon et al. (2020) screened Filipino dentists and physical therapists (PTs) to examine the education, awareness, and knowledge of health professionals in TMD management.(26) The authors reported that health professionals with more years of experience were more aware of TMD,(26) which is similar to our findings. However, they found that dentists who had undertaken training courses were more knowledgeable about TMD, while in our study, dentists who had taken training courses did not differ from their peers in their referral patterns.

The study is limited to dentists who work in the Royal Medical Services, and the study findings may not apply to dentists who work in other public sectors or in the private sector. Future studies with participants from other government sectors and private practice are needed. The response rate was relatively acceptable (62.3%), and a higher response rate would be more generalizable to all dentists in the RMS.

## **CONCLUSION**

Most dentists refer patients with TMD to another dental specialty, especially oral surgery. A limited number refer patients with TMD for physiotherapy, and most dentists were not aware of the role of physiotherapy and its benefit in TMD treatment. A possible explanation is the lack of available trained physical therapists who have advanced education in TMD management. Thus, there is an immense need for raising awareness among dentists through presentation and training courses. Future studies may study the effect of an awareness campaign about the role of other health care providers, such as PTs, on the referral of patients and on the satisfaction of patients with TMD. Therefore, advanced educational courses related to TMJ will be needed for both dentists and physical therapists to enhance collaboration between the two professions in TMD management.

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