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Treatment options used in the management of people with temporomandibular disorders by Australian dentists and physiotherapists

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Abstract

Background: Studies documenting the treatments used by dentists in the management of temporomandibular disorders (TMDs) have been undertaken in some countries; however, no such research has been conducted in Australia. No similar studies have been documented for physiotherapists.

Objective: The aim of the study was to determine the treatment options and referral patterns used by Australian dentists and physiotherapists in managing people with TMDs.

Methods: Prospective nationwide online questionnaires targeting Australian dentists and physiotherapists were created for Australian dentists and physiotherapists.

Results: Seventy-eight respondents (27 dentists; 51 physiotherapists) completed all questions in the questionnaires. Sixty respondents reported actively treating people with TMDs. The treatment options used most frequently by dentists included advice and education, oral appliances, physical agents such as moist heat and medications. The treatment options most frequently used by physiotherapists included manual therapy, exercises, electrophysical agents and advice and education. Referrals were most frequently made to dentists and physiotherapists with experience and/or expertise in managing people with TMDs and to general dentists.

Conclusions: Commonly used treatment options were mostly conservative, reversible and evidence-based. More responses are required to draw conclusions representative of Australian dentists and physiotherapists in the management of people with TMDs.

KEYWORDS
Australian, dentist, physiotherapist, temporomandibular disorders, treatment

1 | INTRODUCTION

Temporomandibular disorders (TMDs) is an umbrella term encompassing pain and disorders affecting the temporomandibular joints (TMJs), masticatory muscles and related structures.[1,2] People with TMDs can experience localised or generalised orofacial pain, limitations or changes in the movement of the jaw, and joint sounds such as popping, clicking and grating, all of which can impair jaw function.[3–5] Temporomandibular disorders are commonly managed by dentists[6] and have been estimated to affect between 5% and 12% of the adult population[7] with more

This work was completed at Australian Catholic University.

recent estimates of their incidence being reported as high as 34% in the world population.[8] Furthermore, based on data from 2004 to 2006 the incidence of TMDs in Australia has been estimated to be 9.9%.[9] Physiotherapy has also been suggested to be effective in the management of people with TMDs[10–13] to relieve pain from the muscles and joints, and restore jaw and joint mobility.[11] Current evidence-based recommendations for the management of people with TMDs indicate conservative and reversible treatment options.[14–17]

There are a variety of treatment options used by dentists and physiotherapists in the management of people with TMDs.[4,10–13,18–24] A recent report published through the United States National Academies of Sciences, Engineering, and Medicine recommends a biopsychosocial approach to the management of TMDs that is evidence-based, comprehensive, holistic and conservative and is delivered through coordinated multidisciplinary care that may involve a team of health professionals.[17] Treatment options reported in the literature that are or have been utilised by dentists include education and self-management, medications, oral appliances, dental occlusal adjustment and surgery.[7,18–20,24] Treatment options utilised by physiotherapists include education, exercise programs, manual therapy and postural training.[4,11,25] Some treatment options are common to both dentistry and physiotherapy such as exercise prescription, stress management, relaxation and diet counselling.[4,10,18–20,22–25] More recent literature also suggests physiotherapy can be used alongside dentistry in the management of people with TMDs with positive results.[26]

The treatment options and/or referral patterns of dentists have been reported for the United States,[18,19] Korea,[22] Germany,[24] Japan[20] and Sweden.[23] Studies that documented referral patterns of dentists revealed that around half of those with TMDs were referred for management to other health practitioners, commonly to physiotherapists, orthodontists, oral and maxillofacial surgeons, and pain clinics.[18,19,22] Although dentists commonly referred people with TMDs to physiotherapists, one systematic review suggested a lack of awareness in dentists as to the benefits of referring to physiotherapists.[14] No studies have been conducted regarding the treatment options and referral patterns of physiotherapists when managing people with TMDs. Moreover, no research has been found looking at Australian dentists' practice regarding the treatment options in the management of people with TMDs.

It is currently unknown what common treatment options are being used for management of TMDs by dentists and physiotherapists within Australia, and whether people with TMDs are being treated with a multidisciplinary approach. The aim of this study is to determine the treatment options used by, and referral patterns of Australian dentists and physiotherapists in the management of people with TMDs.

2 | MATERIALS AND METHODS

A prospective nationwide questionnaire targeted at Australian dentists and physiotherapists was conducted between June 2018 and November 2020. Two targeted questionnaires were developed to gather information from Australian dentists and physiotherapists on their treatment options and referral patterns in managing people with TMDs.

Ethics approval was obtained from the University of Sydney Human Research and Ethics Committee (Project Number: 2021/1670) and the Australian Catholic University Human Research and Ethics Committee (Ethics Number: 2018-2R).

2.1 | Participants

Dentists and physiotherapists registered to practice in Australia were eligible for inclusion in the study. Those who had not practiced or managed people with TMDs in the preceding 12 months were excluded.

As of June 2017 there were 22 383 dentists and 30 351 physiotherapists registered to practice in Australia.[27,28] Based on the total population size of 52 734 registered dentists and physiotherapists, a sample size estimate of 2086 completed questionnaires would be required to give a sampling error of ±3% within a 95% confidence interval.[29] The sample size estimate was further stratified to 1019 dentists and 1067 physiotherapists to represent the proportions of dentists and physiotherapists registered to practice in Australia.

To maximise the response rate of the questionnaires a combination of probability-based sampling, as well as non-probability sampling was employed. The Australian and New Zealand Academy of Orofacial Pain (ANZAOP) was contacted initially with a link to the questionnaires to provide to potential participants. Passive snowballing was also implemented whereby ANZAOP members were asked to pass on the questionnaire link to other potential respondents. Members of ANZAOP were also able to suggest other potential respondents that may be willing to complete the questionnaire so that the researchers may then contact the potential respondents and invite them to participate in the study. This non-probability sampling approach of snowballing has previously been used successfully to maximise response rates for questionnaires.[30,31] It is reported to be a useful sampling technique especially in situations where it may be difficult to identify the population of interest in a study[31] such as in our case, clinicians who actively provide treatment and management strategies to people with TMDs. Although the snowball sampling assisted in targeting potential respondents whose primary clinical practice is focused on the management of people with TMDs, it was recognised that this methodology could not be relied upon as a probability sample.[31] Therefore to maximise recruitment, members of the Australian Dental Association (ADA) and Australian Physiotherapy Association (APA) were also invited to complete the web-based questionnaire through advertising in the respective professional magazines and/or email based newsletters.

2.2 | Questionnaire

Two profession specific questionnaires were used to gather data on the treatment options and referral patterns used in managing people with TMDs. The two profession specific questionnaires were developed based on two previous reports that investigated the

management strategies utilised by general and specialist dentists in the United States.[18,19] The questionnaires were expanded to include questions that would capture more detailed information on management strategies and referral patterns of dentists and physiotherapists in Australia. The questionnaires contained 28 questions, utilising a combination of multiple choice, Likert scale and open-ended questions. The questions included:

- Demographical information (12 questions): age; gender; employment health sector/s; location of practice; qualifications; areas of specialised training; membership of any specialty groups.
- Preferred treatment options for people with TMDs (12 questions): participant's knowledge of TMD treatment options; level of interest and confidence in treating people with TMDs; treatment options utilised and their frequency; use of combinations of treatment options; short and long-term management.
- Referral patterns for people with TMDs (four questions): who do they refer to and from whom do they receive referrals.

Questionnaires were initially developed and validated through discussion with members of the research team and then trialled by five dentists and five physiotherapists who were independent of, and not included as participants in the study. The questions were refined as needed and then translated to an online questionnaire into the three sections of demographics, treatment options and referral patterns.

Qualtrics survey software (Version 13.35.01, Qualtrics, Provo, UT, USA) was used as the platform for the online questionnaires. The online questionnaires were tested by the researchers and local university students for length and clarity. Participant information was automatically de-identified through the Qualtrics survey software.

2.3 | Statistical analysis

Results were exported from Qualtrics as a text file for analysis through Microsoft Excel (Excel Version 15.33). The results are presented using descriptive statistics, and the open-ended responses were reviewed for similarity.

3 | RESULTS

Between June 2018 and November 2020 44 dentists and 83 physiotherapists accessed the online questionnaire. Twenty-seven dentists and 51 physiotherapists answered all the questions, and the data from these 78 respondents are presented. Respondent drop-out rates are shown in Figure 1.

3.1 | Respondent demographics

Respondent demographics are presented in Table 1.

3.2 | TMDs caseload and respondent confidence, knowledge and interest

Twenty-six dentists and 45 physiotherapists reported seeing people with a diagnosis of a TMD in the past year, with the percentage of the total patient caseload ranging between <1% and 70% (dentists: mean 13.6%, SD 17.9; physiotherapists: mean 17.4%, SD 20.5). Fifteen dentists and 42 physiotherapists reported receiving referrals for people with TMDs from other health practitioners. Details regarding these referrals is presented in Table 2.

Twenty-five dentists and 47 physiotherapists reported they had knowledge of specific treatment options for management of people with TMDs. The three commonly reported sources of knowledge for dentists and physiotherapists were professional education courses where the main topics covered were TMDs and their management ($n=16$ and 39 respectively), peer reviewed journals ($n=16$ and 36 respectively) and their colleagues ($n=18$ and 31 respectively). Dentists and physiotherapists also selected similar responses for other sources of knowledge. These included reading textbooks ($n=10$ and 33 respectively), conferences and symposia which included topics on TMDs ($n=14$ and 17 respectively) and undergraduate degree ($n=14$ and 14 respectively).

Fourteen dentists (51.9%) and 34 physiotherapists (66.7%) reported having a high or very high level of interest in treating people with TMDs. Seven dentists (25.9%) and 34 physiotherapists (75.6%) reported having a high or very high level of confidence in treating people with TMDs.

3.3 | Treatment

Seventeen dentists (63.0%) and 43 physiotherapists (84.3%) reported actively managing people with TMDs over the previous year. Dentists reported treating between two and 99% of their total caseload of people with TMDs (mean 47.6%, SD 32.7) and physiotherapists reported treating between one and 100% of their total caseload of people with TMDs (mean 87.8%, SD 29.4).

The number of respondents using different treatment options is summarised in Figure 2. Respondents could select and indicate their frequency of use for treatment options and were able to select multiple treatment options.

For further information regarding respondent's use of treatment options for managing people with TMDs please see Appendix.

3.3.1 | Oral appliances

Sixteen dentists (94.1%) reported the use of oral appliances and 18 physiotherapists (35.5%) reported providing advice on oral appliances for the management of people with TMDs. The frequencies of use are shown in Figure 3. Oral appliances were reported to be prescribed for between one and 16 h a day (mean 7.8, SD 2.7) by dentists while physiotherapists reported to advise people with TMDs to wear their oral appliances between 0 and 20 h (mean 4.9, SD 4.5).

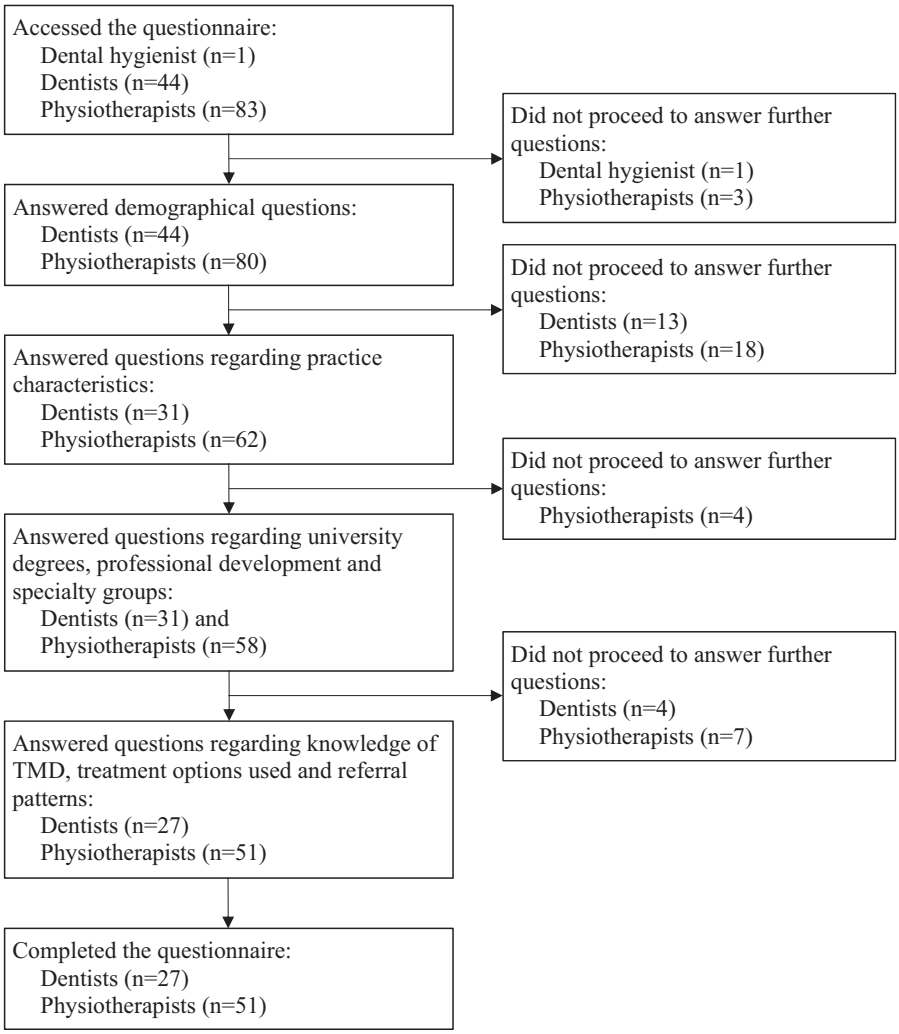

FIGURE 1 Flow of respondents throughout the questionnaire.

3.3.2 | Treatment combinations

Fourteen dentists (52%) and 40 physiotherapists (78%) indicated they used combinations of treatment options to manage the TMD component of people with TMDs, and most ($n = 11$ and 33 respectively) provided details on which treatment combinations they used. Commonly reported treatment combinations for dentists included oral appliances and medications; oral appliances, medication and advice/education; and oral appliances, medication and physical agents. For physiotherapists, commonly reported treatment combinations included advice/education, manual therapy and stress management; advice/education, manual therapy and exercise; and advice/education and manual therapy.

3.3.3 | Short and long-term treatment options

Respondents were asked to provide details on their short and long-term treatment options for people with TMDs. Twelve dentists provided details on their short and long-term management of people with TMDs. The most commonly reported treatment options used by dentists in the short term included medications ($n = 8$), advice and education ($n = 8$), oral appliances ($n = 6$), physical agents ($n = 4$), and dental occlusal adjustment ($n = 3$). The most commonly reported treatment options used by dentists in the long term included oral appliances ($n = 12$) and medications ($n = 3$), and advice and education ($n = 2$).

Thirty-three physiotherapists provided details on their short-term management of people with TMDs, and 30 physiotherapists provided details on their long-term management of people with TMDs. The most commonly reported treatment options used by physiotherapists in the short term included manual therapy ($n = 31$), exercises ($n = 26$), advice and education ($n = 21$), relaxation/stress management ($n = 16$), electrophysical agents ($n = 11$). The most commonly reported treatment options used by physiotherapists in the long term included exercises ($n = 23$), advice and education ($n = 19$), relaxation/stress management ($n = 16$), manual therapy ($n = 14$), and electrophysical agents ($n = 4$).

TABLE 1 Respondent demographic information.

	Dentists (*n* (%))		Physiotherapists (*n* [%])	
Total respondents	27		51	
	Range	Average	Range	Average
Age (years)	25–67	42.3	27–75	46.8
Years practicing	0.5–49	18.6	2.5–52	24.3
Gender				
Females	16 (59.3)		31 (60.8)	
Primary employment type				
Private practice	24 (88.9)		37 (72.5)	
Public hospital	2 (7.4)		6 (11.8)	
Community setting	1 (3.7)		6 (11.8)	
Private hospital	-		1 (2.0)	
Other (unspecified)	-		1 (2.0)	
Participant location				
New South Wales	9 (33.3)		13 (25.5)	
Queensland	8 (29.6)		7 (13.7)	
Victoria	5 (18.5)		19 (37.3)	
Tasmania	2 (7.4)		-	
Western Australia	1 (3.7)		5 (9.8)	
South Australia	1 (3.7)		5 (9.8)	
Northern Territory	1 (3.7)		-	
Australian Capital Territory	-		1 (2.0)	
Member of professional group (interest in TMDs / orofacial pain)	7 (25.9)		5 (9.8)	
Completed advanced training courses[a]	11 (40.7)[b]		39 (76.5)[c]	

[a]Respondents could indicate multiple advanced training courses they had participated in.

[b]Advanced training courses in one or more of: orthodontics ($n=5$), prosthodontics ($n=5$), oral surgery ($n=4$), conscious sedation ($n=3$), oral implants ($n=2$) and forensic odontology ($n=2$).

[c]Advanced training courses in one or more of: musculoskeletal physiotherapy ($n=29$), sports physiotherapy ($n=16$) and manipulation ($n=11$).

3.3.4 | Referrals to other health professionals

Twenty-four dentists (88.9%) and 40 (87.0%) physiotherapists indicated they referred people with TMDs to other health practitioners for assessment or ongoing management. Respondent referral pattern details are shown in Table 3.

4 | DISCUSSION

This is the first study to document the current treatment options and referral patterns of Australian dentists and physiotherapists in managing people with TMDs. The representation of Australian dentists and physiotherapists from a variety of locations, and a range of ages and years of practice suggests the questionnaires reached a cross-section of the two professions. The high percentage of respondents primarily working within private practice could potentially reflect an area of practice where people with TMDs are more commonly treated by dentists and physiotherapists.

TABLE 2 Referrals to respondents from other health practitioners for people with TMDs.

	Dentists (*n*)	Physiotherapists (*n*)
Referral reason		
Assessment, advice and ongoing management	9 (60.0%)	20 (47.6%)
Assessment and/or advice only and referral back to initial clinician for ongoing management	2 (13.3%)	1 (2.4%)
Both of the above	4 (26.7%)	21 (50.0%)
Referring health practitioner		
General practitioner	10	36
General dentists	10	35
General physiotherapists	4	31
Dentist with experience in TMDs[a]	-	17
Oral and maxillofacial surgeon	1	15
Other specialist medical practitioner[b]	4	21
Other[c]	5	8

[a]Includes prosthodontists, oral medicine specialists, orthodontists, orofacial pain specialists, periodontist and endodontists.

[b]Including ear, nose and throat specialists, genetic specialists, sleep physicians, pain specialists, rheumatologists, neurologists, oral medicine specialists.

[c]Including osteopaths, psychologists, naturopaths, myotherapists, speech pathology cancer specialists, Bowen therapists, chiropractors.

4.1 | Treatment

The results of this current study showed most respondents utilised a variety of treatment options, and often these were used in combinations. There were treatment options used by both dentists and physiotherapists, and each profession also had unique treatment options. Treatment options selected only by dentists included medication prescription and dental occlusal adjustment; unsurprising given that these treatment options are outside of the current scope of practice for physiotherapists. For physiotherapists unique treatment options included cervical spine and TMJ mobilisations, which are similarly outside of the scope of practice for dentists.

Most treatment options frequently used by Australian dentists and physiotherapists were conservative and reversible, which aligns with current recommendations.[14–17] The exception to this included the use of dental occlusal adjustment ($n=7$ dentists) which is commonly reported in previous studies conducted prior to the

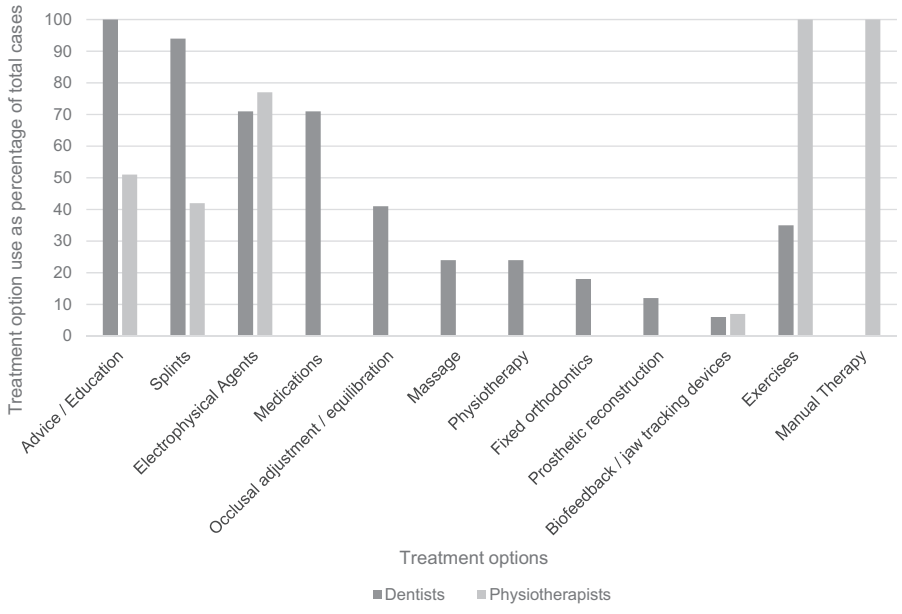

FIGURE 2 Respondents use of treatment options in the management of people with TMDs.

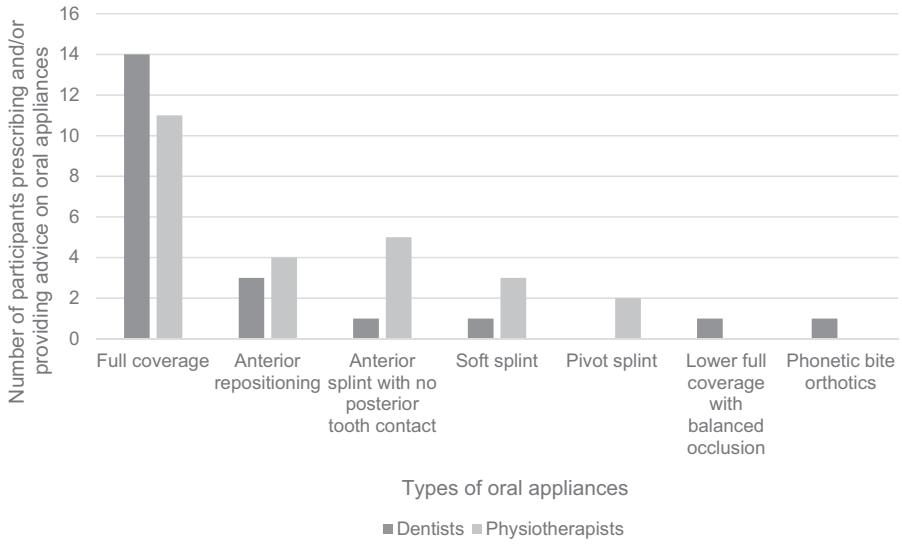

FIGURE 3 Respondent prescription of and/or advice regarding oral appliances in the management of people with TMDs.

publications of management recommendations for people with TMDs.[18–20,22,24] Current literature does not support the efficacy of this treatment option in the management of people with TMDs.[32,33] The frequent prescription of oral appliances by dentists reported in the current study is consistent with studies conducted in the United States,[18,19] Korea,[22] and Japan.[20] Full coverage splints were the most frequently used type of oral appliance prescribed in our sample, and evidence suggests that these can be useful for people with TMDs without clinical evidence of a displaced disk to improve symptoms of chronic pain, joint noises, and difficulty of mouth opening.[34]

The results of the current study suggest that treatment options commonly utilised by Australian physiotherapists in treating people with TMDs are reflective of the efficacy of these management options as reported in the literature.[10,12,13,35–38] Treatment options such as cervical spine and TMJ mobilisations and myofascial release/massage have been reported to reduce the symptoms of TMDs,[13,35–37] and were commonly reported to be used by physiotherapists in managing people with TMDs. Dry needling/acupuncture was also utilised by physiotherapists in the current study, which has been suggested to produce short term analgesic effects and be an effective adjunctive treatment for painful TMDs.[38] Some physiotherapists reported providing advice on oral appliances ($n=15$ physiotherapists). Further studies may help to elucidate the type and quality of advice that physiotherapists provide regarding oral appliances and whether this aligns with advice provided by the prescribing dentist.

A range of exercises, both in the clinic and at home, were also commonly used by both dentists and physiotherapists. Exercise therapy may provide moderate short term and varying long term benefits[37] with both active and passive oral exercises reducing the symptoms of TMDs and improving range of motion.[12,13,37] Postural retraining of the cervical and thoracic spine for the management of jaw pain has also been shown to decrease pain and increase mouth opening.[12,13,37]

TABLE 3 Respondent referral patterns to other healthcare professionals for people with TMDs.

Healthcare professional[a]	Dentists (*n*)	Mean % of caseload referred (%(SD))	Physiotherapists (*n*)	Mean % of caseload referred (%(SD))
Dentist with experience and/or expertise in the management of people with TMDs[b]	19	53.8 (38.8)	27	23.3 (26.3)
General dentist	-	-	21	27.9 (22.4)
General physiotherapist	10	45.0 (23.6)	-	-
Specialist physiotherapist[c]	7	38.6 (31.2)	12	24.5 (37.2)
Other specialist medical practitioner[d]	5	26.7 (11.3)	2	52.5 (53.0)
General medical practitioner	5	39.4 (44.9)	20	28.6 (28.0)
Pain specialist/Pain medicine physician	4	12.5 (6.5)	6	17.5 (16.7)
Psychologist	3	38.3 (45.4)	8	18.3 (14.9)
Rheumatologist	4	11.8 (7.7)	2	3 (2.8)
Osteopath	3	26.3 (15.8)	-	-

[a]Respondents could choose more than one response.

[b]Including prosthodontists, oral medicine specialists, oral and maxillofacial surgeons, dentists able to make OSA appliance, orthodontists, orofacial pain specialists, and endodontists.

[c]Including physiotherapists with experience treating people with TMDs, experience treating the head and neck, and experience with deep tissue massage.

[d]Including ear, nose and throat specialists, genetics specialists, podiatrist, and sleep physicians.

4.2 | Referral patterns

Results from this study indicated a variety of referrals between dentists, physiotherapists, and other health professionals in the management of people with TMDs, with a high percentage of respondents receiving TMD referrals from other health practitioners. While there is no international comparison for physiotherapists, compared to the 2017 study conducted in Japan[20] Australian dentists seem to be referring a larger proportion of their caseload of people with TMDs to other health professionals.[20] Compared to studies from the United States[18,19] and Korea,[22] Australian dentists more frequently referred to multidisciplinary teams that typically use conservative and reversible treatment options, which aligns with the current recommendations of the American Association for Dental Research.[16,17]

4.3 | Multidisciplinary management of people with TMDs

The commonly reported use of advice and education, relaxation and stress management techniques among dentists and physiotherapists suggests both professions are utilising a biopsychosocial approach for the management of people with TMDs. Both dentists and physiotherapists in the current study referred people with TMDs to psychologists which is possibly a reflection of the acknowledged impact of psychological factors in TMDs[17,39] and the growing multidisciplinary approach in the management of people with TMDs.[33,40] Both musculoskeletal and psychological factors can influence the impact of TMDs in different individuals, and the importance of addressing both has been widely reported in the literature.[10,12,13,17,33,39,40] The wide variety of treatment options, combinations, and frequency of use of treatment options suggests respondents are potentially altering their management to meet person-dependent factors, which has been shown to be an area requiring improvement from clinicians in the management of people with TMDs.[17] The referral patterns of respondents to multiple other health professionals suggests the recommended multidisciplinary approach is being adopted.[17,40]

4.4 | Knowledge and confidence of treatment options

Lack of confidence among dentist respondents could be due to limited experience in the management of people with TMDs both at an undergraduate and graduate level, with many respondents reporting people with TMDs accounted for low percentages of their caseloads and few respondents having undertaken professional development in areas relevant to TMDs. Lack of familiarity of the recent comprehensive management reviews and recommendations could also be a contributing factor.[17]

In light of changes in evidence-based management for TMDs, these results suggest Australian dentistry and physiotherapy entry-level curricula and post-graduate training be regularly reviewed and, as needed, modified and supplemented by emerging evidence-based practice.[17] It is unknown if the treatment options being used could be dependent on respondents' institution of study, differing levels of knowledge, or self-perceived proficiency in administering certain

treatments. The high percentage of respondents referring people with TMDs to other health practitioners may reflect the respondents reported low confidence in managing people with TMDs. A high referral rate may also reflect that further ongoing management of the TMD may be out of that individual's scope of practice and the best interests of the patient may be better served by a different health professional with specific skillsets.

4.5 | Study limitations

The low number of responses may be a limitation to the generalisability of the results for dentists and physiotherapists across Australia. It is currently unknown how many dentists and physiotherapists actively manage people with TMDs, thus the sample size estimated for this study was based on the total number of registered practitioners in each profession in Australia. This recruitment strategy attempted to capture as many dentists and physiotherapists that managed people with TMDs as possible. Hence the response rate may be reflective of a small number of dentists and physiotherapists in Australia who actively manage people with TMDs and may be an appropriate sample size for that population. This research provides an interesting commentary on current practice in Australia (as can best be determined at this point) and could be a stimulus for further discussion within the physiotherapy and dentistry professions on management for people with TMD, consideration of interprofessional management of these people, and informative for entry and post graduate training programme curricula.

The wording of the questionnaires may have suggested that only those experienced in managing people with TMDs should respond, reducing the overall response rate. Of note, 31 respondents did not continue the questionnaire when asked about their practice characteristics, perhaps perceiving providing the postcode of their practice may compromise their anonymity. A further 11 respondents ceased the questionnaire when asked about detailed information on treatment options they use in the management of people with TMDs. This could possibly be attributed to a lack of experience and/or confidence in managing people with TMDs.

The questionnaires were successful in documenting the frequency of treatment options and referral patterns. However, for the open-ended responses it was sometimes difficult to interpret the comments, such as dentists utilising 'physiotherapy' as a treatment option. Additionally, there were some instances where respondents could pick multiple, conflicting answers within the questionnaires. Greater pilot testing of the questionnaires may have improved the clarity of some questions.

4.6 | Future areas of research

Whilst this study has provided insight into clinical demographics, treatment options and referral patterns for TMDs, the response rate was low. For further similar studies, more widespread advertising and a longer period of data collection may be considered to recruit a larger sample size and improve generalisability of the results. Future research areas could include investigating reasons why respondents chose certain treatment options/referral patterns and the perceived effectiveness of each to better understand current practices of Australian dentists and physiotherapists who manage people with TMDs. Studies on the current practices of physiotherapists from an international perspective would also be beneficial to see if Australian practices are reflective of those elsewhere in the world.

Further studies could be performed to assess changes to entry-level curricula or implementation of specialist/educational courses with greater emphasis on management of people with TMDs in undergraduate and postgraduate education. The results could help measure the effectiveness of these changes on treatment options used as well as respondent confidence in managing people with TMDs. Finally, the results of the current study could be used for international comparison with similar studies to examine the similarities and differences between clinicians in other countries and their management of people with TMDs.

5 | CONCLUSION

The treatment and referral options used by Australian dentists and physiotherapists in managing people with TMDs have been documented. Commonly used options were mostly conservative, reversible and evidence-based. For dentists, the most commonly used treatment options were advice and education, oral appliance prescription/advice, and physical agents. For physiotherapists, the most commonly used treatment options were exercise prescription, manual therapy, and electrophysical agents. Referral patterns existed between dentists, physiotherapists, and other health professionals. Dentists most commonly referred people with TMDs to specialist dentists with experience in managing people with TMDs, physiotherapists with experience and/or expertise in managing people with TMDs, and general physiotherapists. Physiotherapists most commonly referred people with TMDs to specialist dentists with experience in managing people with TMDs, general dentists, and physiotherapists with experience and/or expertise in managing people with TMDs. The results need to be interpreted with caution as the small sample size may limit our ability to draw firm conclusions related to the options utilised for the management of people with TMDs in Australia. Follow-up or repeat questionnaires with higher response rates may help provide results that are more representative of Australian dentists and physiotherapists.

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CONFLICT OF INTEREST STATEMENT

There are no sources of conflict of interest to report. There are no competing interests to declare.

PEER REVIEW

The peer review history for this article is available at https://www.webofscience.com/api/gateway/wos/peer-review/10.1111/joor.13802.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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APPENDIX

Interventions used by both dentists and physiotherapists as a percentage of respondents treating people with TMD ($n = 17$ dentists and 43 physiotherapists).

Intervention[a]	Dentist total use (%)	Indicated frequency of use >50% of people with TMD as percentage of total use (%)	Physiotherapist total use (%)	Indicated frequency of use >50% of TMD patients as percentage of total use (%)
Oral appliances				
Full coverage	88	67	26	50
Anterior repositioning	18	50	9	-
Anterior splint–no posterior tooth contact	6	-	12	-
Soft splint	6	-	7	33
Pivot splint	6	-	5	-
Lower full coverage with balance occlusion	6	100	-	-
Phonetic bite orthotics	6	100	-	-
Stress management	94	69	74	81
Relaxation techniques	82	53	81	80
Exercises				
Home based active range of motion exercises	24	50	91	90
Home based resistance exercises	24	75	65	68
Home based stretching exercises	24	75	88	79
Home based hold-relax exercises	-	-	51	68
In room active range of motion exercises	6	-	84	89
In room resistance exercises	18	33	53	70
In room stretching exercises	6	50	77	73
In-room hold-relax exercises	-	-	56	63
Other exercises	-	-	33	86
Heat packs	59	50	49	52
Diet counselling	47	37	51	73
Ice packs	24	25	28	25
Psychotherapy/counselling	24	25	16	71
Soft tissue massage	24	50	79	79
Deep tissue massage	12	50	63	70
Acupuncture/dry needling	6	-	51	64
Ultrasound	6	-	33	29
Jaw tracking device	6	-	2	100

[a] Respondents could choose more than one response.

Interventions reported only to be used by dentists as a percentage of respondents treating TMD ($n = 17$).

Intervention	Dentists total use (%)	Indicated frequency of use >50% of TMD patients as percentage of total use (%)
Medications[a]		
Ibuprofen and combinations	65	45
Paracetamol and combinations	41	43
Antidepressants or antiepileptics	29	20
Other nonsteroidal anti-inflammatory drugs	24	25
Dental occlusal adjustment	41	29
Physiotherapy	24	75
Fixed orthodontics	18	-
Prosthetic reconstruction	12	-

[a] Other medications, including norgesic, Cox2 inhibitors, botulinum toxin, pregablin, opioid analgesics, and meloxicam, were reported to be used infrequently.

Interventions reported only to be used by physiotherapists as a percentage of respondents treating TMD ($n = 43$).

Intervention	Physiotherapist total use (%)	Indicated frequency of use >50% of TMD patients as percentage of total use (%)
Mobilisations		
Cervical spine Grade 1–4	95	83
TMJ Grade 1–4	91	82
Cervical spine Grade 5	21	11
TMJ Grade 5	2	-
Medications[a]		
Paracetamol and combinations	42	9
Ibuprofen and combinations	42	12
Non-steroidal anti-inflammatory drugs	35	7
Cox2 Inhibitors	26	7
Taping	12	-
Electromyography biofeedback	7	67
Transcutaneous electrical nerve stimulation	5	-

[a] Note that physiotherapists were asked which medications they provided advice on rather than what they prescribed.