

Physiotherapy in the management of disorders of the temporomandibular joint—perceived effectiveness and access to services: a national United Kingdom survey

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Abstract

Up to a quarter of the general population has experienced temporomandibular joint disorder (TMD) at some point in time. Physiotherapy has been used in the management of TMD for many years, but evidence supporting its clinical effectiveness is limited. We investigated the perceived effectiveness of physiotherapy for patients with TMD among consultants in oral and maxillofacial surgery (OMFS) and the accessibility of these services in the United Kingdom (UK). Information was gathered from a postal or electronic questionnaire sent to the 356 OMFS consultants listed on the British Association of Oral and Maxillofacial Surgeons' website. A total of 208 responded (58%) and 72% considered physiotherapy to be effective. Amongst these respondents, jaw exercises (79%), ultrasound (52%), manual therapy (48%), acupuncture (41%) and laser therapy (15%) were considered to be effective. Twenty-eight percent of respondents did not consider physiotherapy to be effective. Reasons for this included lack of knowledge or expertise of the physiotherapist (41%) and lack of awareness of the benefits of physiotherapy (28%). In relation to access to physiotherapy services, 10% of respondents had a designated physiotherapist for patients with TMD, 89% could refer directly to physiotherapy and 7% worked in an environment that provided training for physiotherapists. Patients were prescribed jaw exercises by 69% of respondents. Despite limited evidence to support its effectiveness, approximately three-quarters of OMFS consultants in the UK regard physiotherapy to be beneficial in the management of TMD.

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Introduction

Temporomandibular disorder (TMD) encompasses a number of disorders that affect the temporomandibular joint (TMJ), masticatory muscles and associated structures.¹ More than a quarter of the general population have had TMD at some point in their lives.² TMD can occur at any age, but most commonly presents in young to middle-aged adults and more frequently in women than in men.³

A non-surgical approach is recommended for initial management.^{1,4,5} This includes education, drug treatment, use of a bite-guard (occlusal splint) and physiotherapy. Surgical intervention, including arthrocentesis or arthroscopy of the TMJ⁶ is indicated in a limited number of patients.

Physiotherapy is commonly used to manage TMD⁷ and aims to restore normal mandibular function by relieving neuromusculoskeletal pain, reducing inflammation and promoting healing in tissues. Various forms of physiotherapy, including jaw exercises, ultrasound and laser therapy, have been used for many years.⁴ However, evidence to support their clinical effectiveness is limited by a lack of consensus in defining TMD, inclusion and exclusion criteria and use of reliable and valid outcome measures.⁸ Many randomised controlled trials (RCTs) are of poor methodological quality

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and are susceptible to systematic bias.⁸ There is no indication of the perceived effectiveness of physiotherapy amongst specialists who treat TMD. Information regarding the uptake and rate of referral to physiotherapy for patients with TMD is also limited.

We aimed to assess the perceived effectiveness of physiotherapy in the treatment of TMD amongst consultants in oral and maxillofacial surgery (OMFS) in the UK and to investigate the preferred methods of physiotherapy advocated by this group. Finally, we aimed to determine how accessible these services are to patients with TMD in the UK.

Method

We designed a questionnaire with dichotomous outcomes relating to the role of physiotherapy in the treatment of TMD (Appendix A). Participants were identified using the website of the British Association of Oral and Maxillofacial Surgeons (BAOMS). Questionnaires were posted to the 356 OMFS consultants in the UK listed on the BAOMS website at the time of the study (January 2010). A further questionnaire was posted to non-responders and an electronic version was emailed to non-responders after two postal drops. Questionnaires were completed anonymously and returned to the authors by post or email.

The primary outcome measures for the study were the respondents' answers to each section of the questionnaire. Responses were quantified and interpreted.

Results

A total of 208 of 356 consultants (58%) responded to the questionnaire; 149 (72%) considered physiotherapy to be an effective treatment for TMD and 58 (28%) did not. One respondent did not know and failed to complete the remainder of the questionnaire so the total number of respondents for the remaining questions was 207.

Perceived effectiveness of physiotherapy

Table 1 shows the perceived effectiveness of treatment modalities amongst the 149 respondents who considered physiotherapy to be an effective treatment for TMD. Other effective methods reported included heat therapy, bite-raising appliances and short-wave diathermy.

Table 1

The perceived effectiveness of treatment modalities amongst respondents who considered physiotherapy to be effective for patients with TMD. Respondents were able to select one, more than one, or all the treatments they considered to be effective.

Treatment	No. (%) (n = 149)
Manual therapy	71 (48)
Laser therapy	23 (15)
Ultrasound	78 (52)
Acupuncture	61 (41)
Jaw exercises	118 (79)

Perceived ineffectiveness of physiotherapy

Of the 58 respondents (28%) who did not consider physiotherapy to be effective, 24 (41%) stated that it was due to the lack of knowledge or expertise of the physiotherapists linked to their unit. Sixteen (28%) attributed this perceived ineffectiveness to a lack of their own knowledge of the benefits of physiotherapy and 28 (48%) stated an "other" reason.

Access to physiotherapy

Of the 207 respondents, 21 (10%) worked in units that had a designated physiotherapist for patients with TMD and 185 (89%) could refer patients directly to physiotherapy. Thirteen (6%) had to refer patients through their general medical practitioner and 15 (7%) consultants worked in hospitals that provided training for physiotherapists.

Of the 24 consultants who believed that physiotherapy was ineffective due to the lack of knowledge or expertise of their physiotherapist, none had a designated physiotherapist for TMD and none provided in-house departmental training for physiotherapists. However, 20 (89%) could refer patients to physiotherapists directly.

Prescription of jaw exercises

Table 2 shows the number of consultants that do (n = 142, 69%) and do not (n = 65, 31%) prescribe jaw exercises.

Of the 118 respondents who regarded jaw exercises to be effective, 104 (88%) prescribed jaw exercises. Of the 31 who regarded physiotherapy, but not jaw exercises specifically, to be effective, 11 (36%) prescribed jaw exercises. Of the 58 who did not consider physiotherapy to be effective, 27 (47%) prescribed jaw exercises.

Table 2

Perceived effectiveness of physiotherapy and jaw exercises amongst respondents who did (n = 142), and did not (n = 65) prescribe jaw exercises.

	Did prescribe jaw exercisesNo. (%)	Did not prescribe jaw exercisesNo. (%)
Physiotherapy is not effective	27 (19)	31 (48)
Physiotherapy is effective but jaw exercises are not	11 (8)	20 (31)
Physiotherapy and jaw exercises are effective	104 (73)	14 (21)

Discussion

To our knowledge this is the first study to investigate the perceived effectiveness of physiotherapy in the management of patients with TMD amongst OMFS consultants in the UK. Almost three-quarters of respondents considered physiotherapy to be effective and the preferred methods were jaw exercises, ultrasound and manual therapy.

Exercise and manual therapy

The principal aims of exercise and manual therapy in TMD are to improve muscular coordination, relax tense muscles and increase muscular strength. Among the consultants who regarded physiotherapy to be effective, over three-quarters considered jaw exercises and almost a half considered manual therapy to be effective. This was mirrored by the findings of two systematic reviews, which supported the use of both active and passive oral exercises in TMD.^{9,10} However, both reviews^{9,10} and a further meta-analysis¹¹ warned that the methodology of the primary studies reviewed was poor and advised that the results should be interpreted with caution.

There may be several reasons for the perceived effectiveness of jaw exercises for TMD amongst OMFS consultants. They are considered to be time and cost effective, they are not invasive and are almost exclusively managed by the patients themselves.⁵ In the authors' experience, jaw exercises are a universal component of the conservative management of TMD and are often prescribed at the initial consultation following diagnosis. Since it is inevitable that other non-surgical measures are discussed at this stage, it is impossible to determine clinically whether jaw exercises alone are effective.

Although many respondents prescribed jaw exercises, it is not known whether the exercises were originally prescribed and programme designed by a physiotherapist, and whether consultants subsequently reviewed the patients. When tailoring an exercise programme, a physiotherapist will consider the desired outcomes and then use them at subsequent sessions to measure whether the exercises are having the desired effect.

Interestingly, almost half the respondents who did not consider physiotherapy to be effective still prescribed jaw exercises and over 10% of those who did consider jaw exercises to be effective, did not prescribe them. We do not know if these respondents referred patients to physiotherapy for the prescription of jaw exercises instead of prescribing exercises themselves. With limited evidence to support the role of physiotherapy in TMD,^{8–11} these inconsistencies are not surprising.

Electrotherapy (laser and ultrasound)

Low-level laser therapy is widely used in TMD and may increase pain tolerance by causing vasodilatation, inducing changes in cellular membrane potency, reducing oedema and accelerating wound healing.¹² The physiological effects of

ultrasound are almost identical to those of low-level laser therapy, but ultrasound is thought to be preferential in the treatment of tissues with denser collagen formation.¹³ A systematic review of low-level laser therapy showed a significant reduction in pain in a number of chronic joint disorders.¹⁴ In contrast, there is little evidence to support a therapeutic role for ultrasound in the management of chronic musculoskeletal disorders.¹⁵ With regard to the management of TMD, a review suggested that low-level laser therapy might be more effective than other kinds of electrotherapy including ultrasound.⁹

In our study, 52% of consultants regarded ultrasound to be effective, but only 15% thought that laser therapy was effective. This contradicts other reports, but must be interpreted with caution. We asked about the respondent's *own* experience, so this inconsistency may exist because fewer consultants use (or have used) laser rather than fewer consultants considering laser to be effective. Also, only those who thought that physiotherapy was effective were asked to select treatments they regarded as useful. Therefore, this result may not have been the true opinion of our entire group.

Acupuncture

The precise mechanisms underlying the action of acupuncture remain unknown, but may include the release of endorphins, serotonin and acetylcholine within the central nervous system.¹⁶ Some systematic reviews have suggested that it has generally positive effects for TMD,^{17–19} but others have not provided adequate evidence to support or refute its use.^{10,20} Although a meta-analysis suggested that acupuncture was comparable to other forms of conservative treatment, the validity of this finding was limited by the poor quality of the primary studies available.¹¹ In our study, 41% of consultants who thought that physiotherapy was effective selected acupuncture as an effective treatment for TMD. However, a greater proportion of these consultants considered other methods (including jaw exercises, manual therapy and ultrasound) to be effective in their experience. Again, the usefulness of this result may be limited.

Multimodal management of TMD

As TMD has a complex aetiology, authors support a multimodal approach to treatment. Systematic reviews advocate a combination of active exercises, manual therapy and relaxation techniques⁹ and a multidisciplinary strategy, which addresses psychological disturbances.²¹ A tendency to combine different types of treatment may explain why a number of our respondents considered several methods to be effective.

Access to physiotherapy

Over a quarter of respondents did not consider physiotherapy to be an effective treatment for patients with TMD and 41% of these consultants thought this because of a lack of

knowledge or expertise on the part of the physiotherapists. Although the majority of respondents (89%) reported that they could refer patients directly to physiotherapy, only 10% reported that they had a designated physiotherapist for TMD and 7% reported having internal training for physiotherapists who managed these patients. Therefore, a lack of specialised training in TMD, rather than access *per se*, may have contributed to the perceived ineffectiveness of physiotherapy amongst consultants. Specialised certification in the management of TMD now exists for physiotherapists and should be encouraged.²²

Limitations of the current study

One limitation was the relatively low response rate (58%). A higher rate would inevitably have produced more representative results.

Although our study reports the *perceived* effectiveness of treatments including prescription of physiotherapy, the results cannot be extrapolated to provide evidence for their effectiveness. Respondents were asked to select treatments that they considered to be effective from their own clinical experience. Although this may be regarded as evidence-based practice based on results seen clinically, the opinion of well-respected authorities in a particular field does not provide robust, scientific evidence. Only further RCTs with sound methodology and subsequent systematic reviews or meta-analysis will provide this. A recent critical appraisal of the methods used in RCTs on treatments for TMD suggested that the quality of studies has improved and predicted a continued improvement in methods to minimise bias.⁸

Respondents were asked if they *could*, rather than if they did, refer patients directly to physiotherapists, so the authors cannot comment on the rate of referral to physiotherapy. Although 7% of respondents thought that physiotherapy in general, and jaw exercises specifically, were effective, they did not prescribe their patients jaw exercises. However, we cannot assume that they referred patients to physiotherapists. One author recommended a physiotherapy referral for approximately half of his patients with TMD,⁵ but the lack of specialist centres for TMJ physiotherapy in the UK suggests far fewer referrals.

Finally, a number of respondents reported effective forms of physiotherapy other than those listed in the questionnaire. As respondents were not formally requested to do this, many would have restricted their response to the five listed.

Three-quarters of the OMFS consultants who responded to the study regarded physiotherapy to be beneficial in the management of TMD. Jaw exercises were regarded by the highest proportion of consultants to be effective and were prescribed by many respondents. Physiotherapy services seem to be readily accessible in the UK, but specialised training for physiotherapists in the management of TMD may be lacking.

The authors recommend a follow-up study of a similar format in 5 to 10 years to investigate changes in trends in the management of TMD. This study may also find differences in the perceived effectiveness of treatments amongst OMFS consultants once further well-designed RCTs have been conducted and published.

Appendix A.

Role of Physiotherapy in the Treatment of Temporomandibular Joint Disorders

1) Do you think physiotherapy is an effective modality for TMJ patients?

Yes No

* If YES which of the following treatment modalities in your experience do you regard as being effective

- Manual therapy
- Laser therapy
- Ultrasound
- Acupuncture
- Prescription of jaw exercises

* If NO, please explain why

- Lack of knowledge/expertise on the part of your physiotherapists
- Lack of your own knowledge of what physiotherapy can offer
- Other

2) Do you have a designated physiotherapist for TMJ dysfunction?

Yes No

3) Can you refer directly into physiotherapy?

Yes No

4) Do you have to send your patients back to their GP to be referred into physiotherapy?

Yes No

5) Do you provide any in-house departmental teaching/training for physiotherapists?

Yes No

6) Do you prescribe exercises to patients?

Yes No

Thank you for taking the time to complete this questionnaire.

References

1. Dimitroulis G. Temporomandibular disorders: a clinical update. *BMJ* 1998;**317**:190–4.
2. Gremillion HA. The prevalence and etiology of temporomandibular disorders and orofacial pain. *Tex Dent J* 2000;**117**:30–9.
3. Scrivani SJ, Keith DA, Kaban LB. Temporomandibular disorders. *N Engl J Med* 2008;**359**:2693–705.
4. Lyons MF. Current practice in the management of temporomandibular disorders. *Dent Update* 2008;**35**:314–8.
5. Wright EF, North SL. Management and treatment of temporomandibular disorders: a clinical perspective. *J Man Manip Ther* 2009;**17**:247–54.
6. Guo C, Shi Z, Revington P. Arthrocentesis and lavage for treating temporomandibular joint disorders. *Cochrane Database Syst Rev* 2009;(4):CD004973.
7. Glass EG, Glaros AG, McGlynn FD. Myofascial pain dysfunction: treatments used by ADA members. *Cranio* 1993;**11**:25–9.
8. Friction JR, Ouyang W, Nixdorf DR, Schiffman EL, Velly AM, Look JO. Critical appraisal of methods used in randomised controlled trials of treatments for temporomandibular disorders. *J Orofac Pain* 2010;**24**:139–51.
9. Medlicott MS, Harris SR. A systematic review of the effectiveness of exercise, manual therapy, electrotherapy, relaxation training, and biofeedback in the management of temporomandibular disorder. *Phys Ther* 2006;**86**:955–73.
10. McNeely ML, Armijo Olivo S, Magee DJ. A systematic review of the effectiveness of physical therapy interventions for temporomandibular disorders. *Phys Ther* 2006;**86**:710–25.
11. List T, Axelsson S. Management of TMD: evidence from systematic reviews and meta-analyses. *J Oral Rehabil* 2010;**37**:430–51.
12. Wilder-Smith P. The soft laser: therapeutic tool or popular placebo? *Oral Surg Oral Med Oral Pathol* 1988;**66**:654–8.

13. Electrotherapy on the web: an educational resource. Available from URL: <http://www.electrotherapy.org>.
14. Bjordal JM, Couppé C, Chow RT, Tunér J, Ljunggren EA. A systematic review of low level laser therapy with location-specific doses for pain from chronic joint disorders. *Aust J Physiother* 2003;**49**:107–16.
15. van der Windt DA, van der Heijden GJ, van den Berg SG, ter Riet G, de Winter AF, Bouter LM. Ultrasound therapy for musculoskeletal disorders: a systematic review. *Pain* 1999;**81**:257–71.
16. Weiner DK, Ernst E. Complementary and alternative approaches to the treatment of persistent musculoskeletal pain. *Clin J Pain* 2004;**20**:244–55.
17. Ernst E, White AR. Acupuncture as a treatment for temporomandibular joint dysfunction: a systematic review of randomized trials. *Arch Otolaryngol Head Neck Surg* 1999;**125**:269–72.
18. Cho SH, Whang WW. Acupuncture for temporomandibular disorders: a systematic review. *J Orofac Pain* 2010;**24**:152–62.
19. La Touche R, Goddard G, De-la-Hoz JL, Wang K, Paris-Aleman A, Angulo-Díaz-Parreno S, et al. Acupuncture in the treatment of pain in temporomandibular disorders: a systematic review and meta-analysis of randomized controlled trials. *Clin J Pain* 2010;**26**:541–50.
20. Rosted P. The use of acupuncture in dentistry: a review of the scientific validity of published papers. *Oral Dis* 1998;**4**:100–4.
21. Türp JC, Jokstad A, Motschall E, Schindler HJ, Windecker-Gétaz I, Ettl DA. Is there a superiority of multimodal as opposed to simple therapy in patients with temporomandibular disorders? A qualitative systematic review of the literature. *Clin Oral Implants Res* 2007;**18**(Suppl. 3):138–50. Erratum in: *Clin Oral Implants Res* 2008;**19**:326–8.
22. Mannheimer JS. Limited evidence to support the use of physical therapy for temporomandibular disorder. How effective are physical therapy interventions in the management of temporomandibular disorder? *Evid Based Dent* 2007;**8**:110–1.