The status of temporomandibular and cervical spine education in credentialed orthopedic manual physical therapy fellowship programs: a comparison of didactic and clinical education exposure

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Objective: The purpose of this investigation was to establish a baseline of physical therapist education on temporomandibular disorders (TMD)-related topics during credentialed orthopedic manual physical therapy fellowship training and compare it to cervical spine disorders education.

Method: An online survey was distributed electronically to each fellowship program credentialed by the American Physical Therapy Association (APTA) and recognized by the Academy of Orthopedic Manual Physical Therapists (AAOMPT). Data were analyzed to compare overall exposure to TMD educational content, including a direct comparison of TMD and cervical spine disorders education.

Results: The response rate was 79%. Thirteen programs (87%) reported providing both didactic and clinical training on both TMD and cervical spine disorders. Didactic education for cervical spine disorders ranged from 16–20 hours to over 25 hours, whereas TMD hours ranged from 0 to 6–10 hours. Clinical education for cervical spine disorders ranged from 11–15 hours to over 25 hours, whereas TMD hours ranged from 0 to 6–10 hours. The number of hours of exposure during didactic training and the number of patients exposed to during clinical training were significantly different when comparing TMD to cervical spine disorders exposure ($P < 0.0001$).

Discussion: The data indicate a lack of uniformity between credentialed fellowship programs in orthopedic manual physical therapy with respect to the extent to which programs expose trainees to evaluation and management of TMD. There is consistency in that all programs provided more training on cervical spine disorders than TMD. Despite a high level of clinical specialization, fellows-in-training receive minimal TMD education.

Keywords: Temporomandibular disorders, Physical therapy specialty, Professional education

Introduction

Both temporomandibular disorders (TMD) and cervical spine disorders are region-specific heterogeneous groups of common musculoskeletal problems that cause people to seek healthcare services. Estimates of the prevalence of TMD, though variable,^{1–4} are as high as 60–90%,^{5,6} while the prevalence of cervical spine disorders, which is also variable,^{7–9} has been estimated to be as high as 70–82%.^{7,10} A recent meta-analysis estimated the management needs for TMD in adults to be 16%,¹¹ while roughly

10–50% of the population may require treatment for cervical spine disorders.^{12–15}

Based on the relative similarities in the prevalence rates of these two groups of region-specific musculoskeletal disorders, it is reasonable to conclude that exposure to relatively equal amounts of didactic and clinical education is warranted for these two anatomical regions. Empirical evidence, however, suggests that patients with TMD have limited access to comprehensive, conservative, musculoskeletal services, a factor not impacting patients afflicted with cervical spine problems.

Some patients seek healthcare services for TMD from dentists.¹⁶ However, evidence from dental journals suggests that dentists receive little to no

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hands-on or didactic training in TMD,^{17–19} demonstrate difficulty in maintaining ideal practices relative to TMD evaluation and management,^{17–19} fail to evaluate symptoms outside the face and head²⁰ despite a reported connection between TMD and the cervical spine,²¹ and may over utilize outdated techniques such as adjusting occlusal disharmonies, modifying the maxillomandibular relationship, and/or adjusting condylar positions.¹⁶ In addition to seeking healthcare services from dentists, some patients suffering from TMD seek services from medical doctors.^{22–24} However, medical doctors receive little to no musculoskeletal healthcare training on any anatomical region²⁵ and are therefore poorly positioned to provide comprehensive, conservative services to patients with TMD. Physical therapists, on the other hand, are trained to provide comprehensive, conservative management of musculoskeletal disorders^{26–28} and outperform nearly every category of medical doctor on knowledge-based musculoskeletal examination.²⁹ Additionally, considerable evidence does exist in favor of utilizing physical therapy for the management of TMD.^{30,31} Physical therapists, therefore, are positioned well compared to their contemporary healthcare counterparts to provide comprehensive, conservative, musculoskeletal management for patients with TMD.

Despite these general trends, clinical practice demonstrates that most physical therapists do not provide services to patients with TMD. This appears to be true even for those physical therapists that receive post-professional musculoskeletal training in orthopedic manual physical therapy fellowship programs, though no formal investigations have been published on this topic for any subgroup of physical therapists. An investigation was therefore conducted to establish to what extent fellowship-trained physical therapists are exposed to TMD education. A viable first step in this process was the implementation of a survey to be completed by all directors of credentialed orthopedic manual physical therapy fellowship programs in the United States, an approach similar to that previously utilized by physicians in the investigation of musculoskeletal education during medical school.²⁵ In the case of the fellowship programs, reporting these data requires little additional effort on the part of those being surveyed because existing regulatory standards require that the data be compiled and reported annually. The purpose of this investigation was to establish a baseline of physical therapist education on TMD-related topics during credentialed fellowship training programs in the United States and to compare it quantitatively with education on cervical spine disorders.

Methods

Exempt status for this investigation was obtained from the Institutional Review Board of Texas Tech University Health Sciences Center. Permission to contact the credentialed orthopedic manual physical therapy fellowship programs, an official contact list, and reassurances that the information gathered would remain anonymous and not be utilized in any punitive fashion were obtained from the American Academy of Orthopedic Manual Physical Therapists (AAOMPT).

From the contact list provided by AAOMPT, communication via electronic mail was utilized to provide a letter in PDF format outlining both the nature and purpose of the survey and included a web-link through which each director and/or representative were able to locate and complete the online survey. The survey was analyzed for face validity and is available online for review as a Supplemental Material <http://dx.doi.org/10.1179/2042618614Y.000000087.S1>. A sample letter is available online as well. The letter ensured that all data would remain confidential, that only the primary investigator would have access to which fellowship programs completed the survey, that the name of each institution would be utilized only for follow-up purposes to improve the response rate, and that no attempts would be made to compile, rank, or individually comment on any of the programs individual responses. Three rounds of communication via electronic mail were sent, and survey respondents were removed from the contact list after completing the survey. The first round of communication was sent in September 2013 and the third in January 2014.

The data were analyzed for trends relative to TMD education, including a direct comparison between TMD and cervical spine disorders education. The number of programs providing education in each area of interest was compiled. The relative number of hours of didactic and clinical education for each topic area was compared, as was the number of patients seen by fellowship students with diagnoses in each region. Each director and/or designated representative was invited to provide additional comments or feedback regarding beliefs about any other relevant information that was not asked about in the survey as well as their opinions on the potential need for an increased emphasis on education with respect to each topic area. The data were ranked ordinally and a Mann–Whitney *U* test was utilized to compare the number of hours of exposure during didactic training for TMD and cervical spine education, as well as the number of patients exposed to during clinical training for TMD and cervical spine education ($\alpha=0.05$).

Results

The survey was distributed to 20 credentialed fellowship programs. One of the fellowship programs was removed from the contact list after their designated representative reported that the program had lost its status as a credentialed program. As a result, a total of 15 out of 19 eligible fellowship programs responded to the survey (79%).

Two fellowship programs (13%) reported training an average of over 15 fellows per year during the previous 3 years. The remaining 13 fellowship programs (87%) trained an average of 4.7 fellows annually (range 1–10) over the previous 3 years. Thirteen programs (87%) reported providing both didactic and clinical training on TMD. One of the 15 programs (7%) reported providing no didactic training on TMD, while a separate program reported not providing clinical training on TMD. Thirteen programs (87%) reported providing both didactic and clinical training on cervical spine disorders, though one program (7%) failed to respond to the didactic education question, while a separate program (7%) reported ‘no’ for clinical training. Both the number of hours of exposure during didactic training and number of patients exposed to during clinical training were significantly different when comparing TMD to cervical spine exposure ($P<0.0001$). A detailed comparison of exposure to cervical spine and temporomandibular spine disorders education for both didactic and clinical training is presented in Table 1.

Out of 15, 13 programs (87%) reported having access to a clinician with ideal academic and clinical expertise to teach advanced orthopedic knowledge and skills on TMD-related topics at the fellowship level. The two programs (13%) that reported not having access to an ideally trained educator did

report providing both didactic and clinical training on TMD-related topics. One program (7%) reported not having access to a clinician with ideal academic and clinical expertise to teach advanced orthopedic knowledge and skills on cervical spine disorder-related topics at the fellowship level. Eight programs (53%) reported the means through which their educators obtained post-professional education on TMD-related topics, six of which involved weekend course training (40%), one of which involved conference-based training (7%), and one of which reported undergoing a clinical specialist training process (7%). Seven programs (47%) provided no answer for this question.

When asked if their credentialed fellowship program requires an increased emphasis on TMD-related topics, 3 of 15 (20%) programs responded ‘yes.’ When asked if their credentialed fellowship program requires an increased emphasis on cervical spine-related topics, twice as many programs (40%) responded ‘yes.’ Additional comments of interest are listed in Table 2.

Discussion

This is the first study to establish a baseline of physical therapists’ exposure to TMD education during credentialed orthopedic manual physical therapy fellowship training and to compare that exposure to education related to cervical spine disorders in the United States. The data suggest that manual physical therapy fellowship education exposure for TMD is significantly lower than that for cervical spine conditions and that fellowship trained orthopedic manual physical therapists may not currently be prepared to serve as the vanguard for the physical therapy profession with respect to the evaluation and management of TMD.

Table 1 Exposure to didactic training and clinical mentoring for cervical spine and temporomandibular disorders (TMD) during fellowship training

	Cervical spine disorders		TMD	
	Answer	(Number of programs)	Answer	(Number of programs)
Hours of didactic training* ($P=0.0001^{\S}$)	0	(0)	0	(1)
	1–5	(0)	1–5	(8)
	6–10	(0)	6–10	(6)
	11–15	(0)	11–15	(0)
	16–20	(6)	16–20	(0)
	21–25	(2)	21–25	(0)
	>25	(7)	>25	(0)
Patients seen during clinical mentoring** ($P=0.0001^{\S}$)	0	(0)	0	(1)
	1–5	(0)	1–5	(12)
	6–10	(0)	6–10	(2)
	11–15	(1)	11–15	(0)
	16–20	(2)	16–20	(0)
	21–25	(2)	21–25	(0)
	>25	(10)	>25	(0)

*The average number of hours of exposure during didactic training over the previous 3 years.

**The average number of patients exposed to during clinical training over the previous 3 years.

§ P value for Mann–Whitney U test.

Two fellowship programs with greater than 15 fellows-in-training per year were at the lower end of the spectrum in terms of reporting both the number of hours of didactic training (1–5) and the average number of patients with TMD seen during mentoring sessions (1–5). This skews the data toward a relative lack of TMD education in credentialed fellowship programs because these two programs, which represent only 10% of the overall number of programs, provided training for greater than or equal to 30% of the fellowship trainees during the period of time in question.

It is somewhat encouraging that the majority of responding programs (87%) reported covering TMD-related topics by means of both didactic and clinical education. However, despite a relatively similar prevalence of TMD and cervical spine disorders in the population at large, fellowship programs provided far more exposure to cervical spine disorders education than TMD education. The highest reported exposure to TMD didactic education (6–10 hours), which occurred across only 47% of the fellowship programs, was lower than the lowest level of reported exposure to didactic training on cervical spine disorders (16–20 hours). Furthermore, the majority of programs (60%) reported ≤ 5 hours of didactic TMD training. Likewise, fellowship programs provided far more exposure to cervical spine disorders education than TMD education during clinical training. The highest reported exposure to TMD clinical training (6–10 patients), which occurred across only 13% of the programs, was lower than the lowest reported level of clinical training on cervical spine disorders (11–15 patients). Furthermore, the majority of programs (73%) reported clinical training with five patients or less when the diagnosis of TMD was involved. In the case of clinical training on cervical spine disorders, two-thirds of the programs (67%) reported that their fellows-in-training were exposed to over 25 patients with cervical spine complaints during their fellowship training process.

Collectively, the data represent a training process that inherently favors cervical spine education when compared to TMD education. Despite the relative lack of TMD education and the relative abundance of cervical spine education, the majority of program directors (80%) did not believe that additional emphasis was required for TMD education, though a solid minority (40%) did report that additional educational emphasis was required for cervical spine disorders. This may indicate that, even at the fellowship training level, there is little importance placed on the temporomandibular region in most but not all programs, a conclusion that is supported by two of the additional comments provided by program directors. As the comments indicate, the origin of this bias away from TMD education is likely grounded in the scarcity of patients being referred to physical therapists for the management of TMD-related complaints. Additionally, it should be considered that a failure to provide sufficient didactic and clinical training on an entire anatomical region has the potential to contribute to a healthcare environment in which an entire group of patients has little to no treatment options. However, because no attempt was made during data collection to expand upon what the program representatives meant when reporting their opinions on whether an ‘increased emphasis’ was required for either area of study, further interpretation of this particular finding cannot be conducted.

There are several potential explanations for these findings. For example, the additional comments provided by program representatives indicate that some program administrators could be biased against providing TMD education, that programs may have insufficient patient referrals to accommodate an increase in TMD clinical education even if doing so is desired, and that overlap between cervical spine and TMD content may skew interpretation of educational content. Unfortunately, this particular survey did not attempt to differentiate between potential reasons for these findings and, based on

Table 2 Additional comments provided by fellowship programs regarding exposure to didactic training and clinical mentoring for cervical spine and temporomandibular disorders (TMD) during fellowship training

Comments
‘Who could argue against more!! Always all of us could use more of everything. But we are pleased with the training we provide and the results we see. We work with several dentists with emphasis on TMJ care. Would as always love to work with other programs to enhance what we offer.’
‘We strongly believe that advanced TMD education has no place in the manual therapy fellowship curriculum, aside from the basic introductory course work we provide. The evaluation and treatment of TMD disorders is a niche practice, much like the treatment of dizziness disorders and women’s health. When you look at the practice patterns of regular orthopedic outpatient facilities, you will find that TMD disorders are a negligible part of the patient mix...’
‘Assessment of cervical pain and headaches is incomplete without screening for TMJ disorders as a potential contributor or primary source of symptoms.’
‘Our facility does not get very many TMD referrals. Of those we do get, most are forwarded to the fellows-in-training or faculty members.’

the additional comments made, programs may be affected both by varying and overlapping factors. Furthermore, this survey did not obtain data about the baseline knowledge and skill level of fellows-in-training upon beginning their studies in credentialed programs. As a result, it is impossible to establish the pre-fellowship preparedness for each topic in question from the current data, which could impact how the data presented here should be interpreted. Further study is required to clarify these points.

Overall, the data presented here indicates a lack of uniformity between credentialed fellowship programs in orthopedic manual physical therapy with respect to the extent to which fellows-in-training are exposed to the evaluation and management of TMD. There is, however, consistency when comparing TMD education to cervical spine education in that all programs provided more training on cervical spine disorders. This is consistent with empirical observations in the physical therapy field. However, according to the epidemiological data, regardless of whether patients suffering from TMD are referred to physical therapy clinics, the need for management services is sufficiently large to warrant further investigation to determine whether or not there exists a need for increased educational emphasis on TMD at the fellowship level.

Future investigations could include attempts to gain insight with respect to patient accessibility to healthcare providers that can successfully address TMD, including the study of what proportion of licensed physical therapist provide effective and efficient services for patients afflicted with TMD. Additionally, in an attempt to expand on this content, future investigations should seek to identify practitioner knowledge and skill levels with respect to TMD-related topics. Non-fellowship training environments, such as entry-level training programs, residency programs, and post-professional degree programs, should all be studied as well.

Limitations

There are several limitations to this investigation. First, the survey process relied upon self-reporting. The potential therefore exists that the responses received were partially inaccurate or biased due to the fact that there is no way to confirm their authenticity. Additionally, the relevance of this study is limited in scope because the investigation dealt only with a small sector of the physical therapy profession within the United States. Furthermore, the data do not build upon any prior studies targeting the field as a whole or any other subsets of the field, which means no conclusions can be made with respect to how the fellowship education process compares to, for example, entry-level education or residency training. No information was collected regarding the status of

program attendees' knowledge or skill levels upon acceptance into or graduation from each program, thus limiting the context in which educational emphasis on each anatomical region can be interpreted. Finally, the external validity of the study is limited because the investigation only dealt with a small sector of the physical therapist education programs within the United States.

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Conflicts of interest Two of the authors of this report are directors of credentialed fellowship programs and therefore served roles both as investigators and subjects during this study.

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