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Knowledge and awareness of physical therapy role in evaluating and treating temporomandibular disorders among physical therapists in Saudi Arabia

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Abstract

Background Practitioners, including physical therapists, are not proficiently trained to evaluate and treat individuals with temporomandibular disorders. The purpose of this study is to evaluate the knowledge and awareness of examining and treating temporomandibular disorders among physical therapists in Saudi Arabia.

Methods An online questionnaire was distributed to physical therapists on different social media platforms. The survey covered demographics characteristics and knowledge of examining and treating temporomandibular disorders. Descriptive statistics were used for data analysis.

Results A total of 143 participants with a mean of age of 30 (\pm 6.6) years participated in this study. The majority of participants ($n = 109$; 76.2%) did not take educational courses on temporomandibular disorders; more than half ($n = 84$; 58.7%) had never evaluated or treated individuals with temporomandibular disorders. Most physical therapists were aware that they could treat individuals with temporomandibular disorders ($n = 121$, 84.6%). The most common evaluation methods were temporomandibular joint palpation, jaw movement during opening and closing, and palpation of the masticatory muscles ($n = 56$, 95%); ($n = 49$, 83%); ($n = 48$, 81%), respectively. The common methods used for treatment were therapeutic exercise strengthening, manual therapy, and patient education ($n = 49$; 83%; $n = 46$; 78%; $n = 33$; 56%), respectively. Thirty-one participants (53%) referred patients to other practitioners.

Conclusion This preliminary study indicates there is a fair level of knowledge, low confidence, low education, and low clinical experience for physical therapists in the evaluation and treatment of temporomandibular disorders in Saudi Arabia. More attention is needed on physical therapy education programs and post-graduate education courses on temporomandibular disorders.

Keywords Temporomandibular disorders, Physical therapists, Dentists, Craniomandibular disorders, Facial pain

Introduction

The temporomandibular joint (TMJ) is a synovial joint that permits complex movements essential to life, such as mastication and speech. It is a joint allowing variation of motions such as jaw opening and closing, backward and forward, and side-to-side (laterally). These motions are achieved utilizing masticatory muscles, such as the temporalis, masseter, medial pterygoids,

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and lateral pterygoids [1]. However, several pathologies can affect the TMJ, mastication muscles, and cervical spine, leading to temporomandibular disorders (TMDs) [2].

TMDs exhibit several symptoms, including orofacial pain, tenderness of mastication muscles, joint noise or crepitus, headache, neck pain, limitation of TMJ range of motion, parafunctional habits, tinnitus, wear of dentition, and otalgia [3]. The potential factors involved in the development of TMDs include trauma to joints or surrounding structures [4], occlusal disease, psychological factor (e.g. anxiety), parafunctional habits (e.g., bruxism), systemic factors (e.g., rheumatoid arthritis) [5, 6], cervical spine disorders [7], and head-and-neck posture [8, 9]. However, there is controversial and unclear result about head and neck posture [10]. TMDs are the second most prevalent musculoskeletal problem in the USA [11, 12].

Previous evidence showed that 40–75% of the USA population had at least one sign of TMDs, while 25% had symptoms of TMDs [2, 13]. A similar study showed that the prevalence of TMDs ranges from 8 to 15% in the adult population in the USA, affecting women more often than men [13]. In Saudi Arabia (SA), the prevalence of TMD ranges from 27.2 to 60.5% of the population [5, 14–17]. Consequently, individuals with TMDs need more attention for healthcare services to alleviate their pain and improve jaw function. Multidisciplinary teams including dentists, physicians, physical therapists (PTs), speech therapists, and psychologists can play critical roles in the successful treatment of individuals with TMDs [18]. However, evidence has recommended conservative and cost-effective approaches for treating individuals with TMDs [19]. Several studies showed that physical therapy (PT) is a conservative, cost-effective, and effective intervention in individuals with TMDs [2, 20].

In PT, the primary goals of TMDs treatment are to alleviate pain and improve jaw function [21, 22]. PTs can use different modalities to relieve pain, inflammation, and promote tissue healing. These modalities include electrical stimulation, laser therapy [23], ultrasound [24], acupuncture [25], and heat applications [2]. Additionally, several studies have supported the use of PT techniques for managing TMDs symptoms. For example, mandibular stabilization exercises correct the mobility of the mandible, increase flexibility, and muscle length of the MTJ [26]. Another approach to obtain appropriate functioning of the jaw is occlusal splint therapy [27]. Moreover, the most common techniques for treating TMDs are manual therapy, therapeutic exercise, and massage therapy [27]. The PTs' decision-making regarding the application of the appropriate intervention should be based on an accurate diagnosis. Therefore, awareness of signs and symptoms, accurate diagnosis, effective intervention, and a

multidisciplinary approach to treating TMDs will result in the achievement of a better prognosis by PTs.

Practitioners, including PTs, are not proficiently trained to evaluate and treat individuals with TMDs [28, 29]. A recent study found that 69% of PTs in the USA did not receive sufficient education on TMDs in an entry-level PT program; 50% were not confident in treating individuals with TMDs [21]. Furthermore, 84 entry-level PT programs in the USA were evaluated for TMDs content. The results showed that PT students had an average 12-h content related to TMDs across the program [30]. Therefore, providing low educational content on PT programs leads to a decrease in the knowledge and awareness of the role of PT in evaluating and treating TMDs and resulting in underservice of TMDs patients. To date, the knowledge and awareness of PTs to evaluate and treat individuals with TMDs are unknown in Saudi Arabia. It is important to ensure that the PT professionals expertly treat individuals with TMDs. Therefore, the primary purpose of this study is to evaluate the knowledge and awareness of examining and treating TMDs among PTs in Saudi Arabia.

Methods

Study design

This is a cross-sectional descriptive study used a previously published questionnaire with permission from the author [21]. The questionnaire was distributed to the PTs in Saudi Arabia.

Participants

An online questionnaire was distributed to PTs via different social media platforms including Telegram, WhatsApp, and Twitter. PTs with active PT licenses were recruited. The questionnaire included an overview of the study objectives. Before starting the questionnaire, the PTs provided their informed consent. The PTs were notified that no personal information would be published and participation was entirely optional.

Questionnaire

The Google Forms questionnaire was used between December 2021 and June 2022. The questionnaire was adapted from a previously published study [21] after extensively reviewed from authors. The author found that the questionnaire items were able to answer our questions. Therefore, permission was obtained from the developer of the questionnaire. However, to use it in Saudi Arabia, we edited some questions and choices for convenient use among PTs in the Saudi population. For example, adding nationality, the membership of Saudi Commission for Health Specialties, deleting question 7 since it is not applicable in Saudi Arabia, and adding

more options to question 8 to cover all applicable health care sitting in Saudi Arabia. Furthermore, we added a section at the end of the survey (nine questions) related to the awareness of TMDs signs and symptoms (Additional file 1). All nine questions asked the PT prior to this survey whether they aware of nine most common TMDs signs and symptoms. A total of 36 items were included in the survey; nine items related to sociodemographic information and work experience, 12 items related to TMDs patients and referrals, six items related to general knowledge and confidence, and nine items related to TMDs signs and symptoms. The estimated time to complete the survey was 5–10 min. There is a statement that said, “Please submit once” to avoid duplication.

Ethical consideration

Before conducting this study, ethical approval was obtained from the local research ethics committee of institute review board (reference number 1443-1167638).

Statistical analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS) software (version 28, SPSS, Inc., Chicago, IL, USA). Descriptive demographic information was summarized, including the participants' age, PT license, experience, education, and work facility. To assess knowledge and awareness regarding the evaluation and treatment of TMDs for PTs in Saudi Arabia, a comprehensive descriptive statistical analysis was used. Data in this study are presented as the mean and standard deviation (SD), total number (*n*), percentage (%), and frequency (*f*). The level of knowledge, awareness, confident, and education was categorized as follows: low (50% or below), moderate/fair (51–75%), and high (76–100%).

Results

Survey response

An online questionnaire was sent to the 622 PTs between December 2021 and June 2022. A total of 152 PTs participated in this survey. Nine participants did not have active licenses, so we did not included them in the study. Therefore, 143 PTs were included in the study. The response rate was 24.4%.

Demographics and characteristics

The average age of the participants was 30 (\pm 6.6) years; more than half were male participants (*n* = 78; 54.5%), Saudi nationals (*n* = 134; 93.7%) holding a bachelor's degree in PT (*n* = 101; 70.6%). A total of 132 (92.3%) are currently practicing PT. The average years of experience was 6 (\pm 6.6) years, and the majority of them described their work setting as outpatient care (*n* = 113; 79%). Extended care, nursing homes, and skilled nursing were

the least common (*n* = 4; 3%). The detailed demographics and characteristics are listed in Table 1.

TMDs evaluation and treatment

Most participants (*n* = 109; 76.2%) had never taken continuing education courses on TMDs. Additionally, more than half (*n* = 84; 58.7%) had never evaluated or treated individuals with TMDs. Among those who evaluated individuals with TMDs (*n* = 59), participants (*n* = 55; 93.2%) estimated that 0 to 50% of their individuals with TMDs experienced TMDs' symptoms. The most common evaluation methods were TMJ palpation, jaw movement during opening and closing, and palpation of the masticatory muscles (*n* = 56, 95%; *n* = 49, 83%; *n* = 48,

Table 1 Descriptive sociodemographic characteristics of physical therapy (*n* = 143)

Characteristics	(<i>n</i>) %
Nationality	
Saudi	(134) 93.7%
Non-Saudi	(9) 6.3%
Gender	
Male	(78) 54.5%
Female	(65) 45.5%
Age mean (SD)	30 (\pm 6.6)
Highest level of education	
Bachelor PT	(101) 70.6%
Academic master PT	(12) 8.4%
Professional master physical therapy (MPT)	(12) 8.4%
Academic doctoral degree	(10) 7%
Doctor of physical therapy (DPT)	(8) 5.6%
Year of experience mean (SD)	6 (\pm 6.6)
Health care setting	
Outpatient (<i>f</i>)	(113) 79 %
In patient (<i>f</i>)	(57) 40%
Rehabilitation/subacute rehabilitation (<i>f</i>)	(42) 29%
Private hospital (<i>f</i>)	(32) 22%
Private clinic (<i>f</i>)	(24) 17%
Public hospital (<i>f</i>)	(21) 15%
Academic (<i>f</i>)	(13) 9%
National football team (<i>f</i>)	(11) 8%
Home health (<i>f</i>)	(10) 7 %
Wellness/prevention/fitness (<i>f</i>)	(7) 5%
Extended care/nursing home/skilled nursing (<i>f</i>)	(4) 3%
Occupational health (<i>f</i>)	(5) 3%
Day care center (<i>f</i>)	(4) 3%
Practice	
Currently practice	132 (92.3%)
Not currently practice	11 (7.7%)

n number, *SD* standard deviation, *f* frequency

81%), respectively (Table 2). Additionally, we asked all participants whether they evaluated the masticatory region, while managing a patient with neck disorders. Participants ($n = 75$; 52.4%) reported “no”.

The most common characteristics of TMDs were muscle tightness/tender points, TMJ hypomobility and mouth opening limitations, and TMJ disc displacement ($n = 38$, 64%; $n = 35$, 59%; $n = 24$, 41%), respectively (Table 3). Most patients were in the chronic stage ($n = 38$, 64%), followed by the subacute ($n = 35$, 59%), and acute stages ($n = 19$, 32%). More than half of PTs reported neck pain, poor posture, and cervicogenic headache in individuals with TMDs ($n = 41$, 69%; $n = 32$, 54%; $n = 38$, 64%), respectively. The common treatment methods were therapeutic exercise strengthening, manual therapy, and patient education ($n = 49$, 83%; $n = 46$, 78%; $n = 33$, 56%), respectively (Table 4).

Patients' referral

Thirty-one participants (53%) referred patients to other practitioners. Of the 31, 17 participants (55%) were referring up to 5% of their patients, nine participants (29%) referred to 25%, and three participants (10%) referred to 50%. Patients were referred to orthodontists ($n = 20$, 65%), specialized PTs and general dentists ($n = 12$; 39%), and oral surgeons ($n = 8$, 26%) (Fig. 1). On the other hand, most participants did not have a patient with TMDs referred from a dentist ($n = 102$, 71.3%).

The knowledge and awareness of TMDs

Most PTs were aware that they could treat individuals with TMDs ($n = 121$; 84.6%). However, 22 participants (15.4%) were not aware of PT interventions for individuals with TMDs, such as reeducation of jaw movement and restoring of masticatory muscle function. Participants ($n = 109$, 76.2%) reported that they did not receive sufficient education regarding TMDs in PT schools.

Table 2 Most common methods used for TMDs evaluation ($n = 59$)

TMDs evaluation items	<i>n</i> (%)
TMJ palpation	56 (95%)
Jaw movements during opening/closing	49 (83%)
Palpation of masticatory muscles	48 (81%)
TMJ sounds (crepitus or clicking)	40 (68%)
Head and neck posture	39 (66%)
Parafunctional habits	36 (61%)
Cervical spinal scan	31 (53%)
Dental occlusion	16 (27%)
None of the above	1 (2%)

n number, % percentage

Table 3 Most common TMDs characteristics ($n = 59$)

TMDs characteristics items	<i>n</i> (%)
Muscle tightness/tender points	38 (64%)
TMJ hypomobility/mouth opening limitations	35 (59%)
TMJ disc displacement	24 (41%)
Headaches (i.e., cervicogenic headache)	22 (37%)
TMJ degeneration	18 (31%)
Associated neck pain/trauma	19 (32%)
TMJ hypermobility	17 (29%)
Parafunctional habits (i.e., bruxism, clenching)	12 (20%)
Occlusion alterations	4 (7%)
TMJ surgery	3 (5%)

n number, % percentage

Furthermore, 69 participants (48.3%) were not confident in treating individuals with TMDs. More than half ($n = 99$, 69.2%) were aware that the teamwork between PTs and dentists would result in successful patient care. The majority of participants were interested in learning about recent evidence on the evaluation and interventions for individuals with TMDs ($n = 132$; 92.3%). Additionally, participants ($n = 105$; 73.4%) are aware that exercise, manual therapy, and postural reeducation are useful interventions for individuals with TMDs.

We also asked the participants about their awareness of the signs and symptoms associated with TMDs. The most common signs and symptoms were restricted mouth opening, joint sound, and masticatory muscle pain ($n = 125$, 87.4%); ($n = 123$, 86%); ($n = 121$,

Table 4 Most common TMDs intervention were used ($n = 59$)

TMDs intervention items	<i>n</i> (%)
Therapeutic exercise strengthening	49 (83%)
Manual therapy	46 (78%)
Patient education	33 (56%)
Intra-oral joint mobilizations	27 (46%)
Electrophysical modalities	23 (39%)
Reeducation of jaw movements	22 (37%)
Deep friction massage	19 (32%)
Eating methods (e.g., mastication alternating bilaterally, choosing soft food, avoiding tough meat, cutting an apple)	18 (31%)
Acupuncture	14 (24%)
Coordination	10 (17%)
Taping	10 (17%)
PNF—proprioceptive neuromuscular function	5 (8%)
Craniosacral therapy and HVLA to cervical spine	3 (4%)
Osteopathic	2 (3%)
Ultrasound	1 (2%)

n number, % percentage, HVLA high velocity-low amplitude

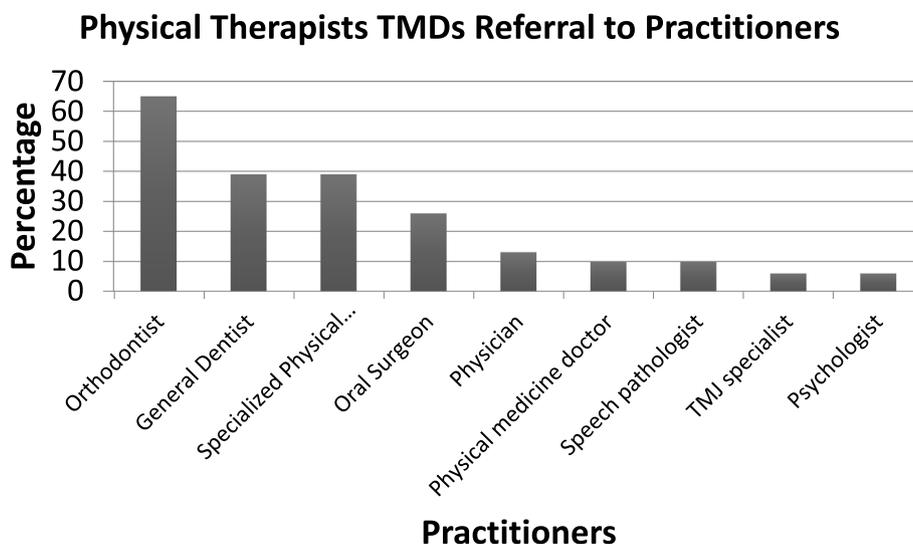


Fig. 1 Physical Therapists TMDs Referral to Practitioners

84.6%, respectively). However, the least common signs and symptoms were not well-known, such as parafunctional habits, such as lip/cheek biting, nail biting, thumb sucking, and bruxism ($n = 63$; 44.1%) (Fig. 2).

Discussion

As far as we know, this study is the first study to evaluate the current level of knowledge and awareness regarding the role of PT in the evaluation and treatment of TMDs

among PTs in Saudi Arabia. The study results indicate fair of knowledge and awareness. Our study sheds light on the PT services provided to treat TMDs. The fair of knowledge and awareness of PT interventions can be attributed to different reasons.

First, there is a lack of clinical practice and continuing education courses on TMDs. More than half of the participants (58.7%) stated that they did not evaluate or treat individuals with TMDs. Furthermore, most participants

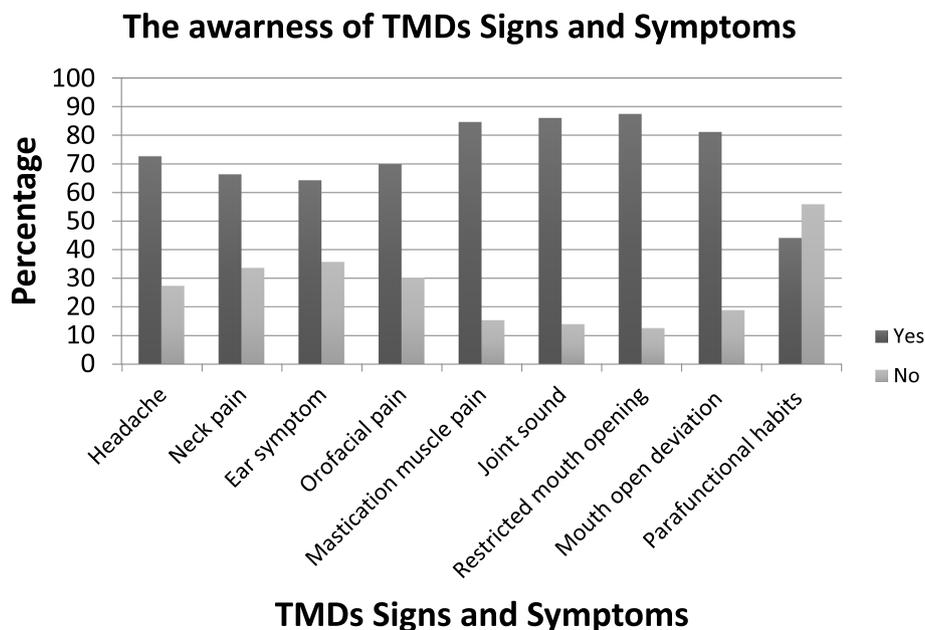


Fig. 2 The Awareness of TMDs Signs and Symptoms

(76.2%) did not take continuing education courses in TMDs after graduation. Interestingly, 15.4% of participants were unaware that they could treat TMDs. Recent evidence has shown that there is a positive relationship between continuing education and the treatment of more patients with TMD [21]. Similar findings were also reported by PTs in the USA. Gadotti et al. [21] reported that 62% of PTs participants did not evaluate or treat individuals with TMDs, and 56% did not have continuing education courses on TMDs.

Second, there was a low rate of TMDs referrals to PT. Recent evidence showed a low rate of patient referral from dentists to PTs [31]. It showed that only 29% of dentists advise the referral TMDs' patients with TMD to PT. In this study, 70.2% of PTs reported that they had never had a patient with TMDs referred to them by dentists. Nevertheless, 65% and 39% of PTs advise the referral TMDs' patients with TMD to orthodontists and general dentists, respectively. The awareness of multidisciplinary interventions for TMDs will encourage health care practitioners to refer TMDs patients to other specialists for better health services [31, 32].

Third, there is inadequate TMDs content in PT programs. In this study, 76.2% of the participants stated that they did not receive adequate education materials on TMDs content during the PT program. Accordingly, almost half of the participants (48.3%) lacked confidence in evaluating or treating TMDs. Similar evidence has shown that 50% of PTs lack confidence in evaluating or treating TMDs because of limited training and clinical experience [21]. Furthermore, anecdotal evidence from a previous study showed that PT students receive less than three educational credited hours in PT programs on the topic of TMDs [32]. The low education of TMDs during PT studies could result in a decrease in the confidence and capability of PTs to evaluate and treat TMDs. Therefore, the findings of this study, similar to previous studies, reported the need to implement evidence-based clinical guidelines for the evaluation and treatment of TMDs. In particular, 92.3% of the participants were interested and wanted to learn more about TMDs. We suggest that more education related to multidisciplinary approaches between PTs and other practitioners, especially dentists, should be reinforced in PT programs [31, 33]. In addition, more efforts should be made to increase the collaborative work between PTs and dentists in conferences and seminars. Furthermore, there is a need for a PT specialized in TMDs programs in Saudi Arabia, as well as more focused scientific research in this regard.

The majority of the participants used TMJ palpation, jaw movement during opening and closing, palpation of masticatory muscles, TMJ sounds, head-and-neck posture, signs of parafunctional habits, and cervical spinal

scans for TMDs evaluation. Dental occlusion was the least frequently evaluated condition (27%). These findings are consistent with those of a similar study [21]. Furthermore, the majority of participants reported these disorders (neck pain, poor posture, and cervicogenic headaches) were presented in patients with TMD. However, less than 15% never evaluate these disorders. Since these disorders are associated with TMDs, careful assessment is important [21]. In this study, a low number of participants (47.6%) evaluated the masticatory system when assessing and managing individuals with neck disorders. However, in a similar study, 71% of PTs evaluated the masticatory system in individuals with neck disorders [21]. This variation in percentages might be due to the level of education at the entry level. However, during the evaluation of individuals with neck disorders, the masticatory system should always be evaluated because of the association between the neck and masticatory system [34]. Neck pain was the second most common symptom of TMDs in 68% of 511 patients [33].

The majority of participants indicated that the patients had jaw symptoms, such as chronic pain, muscle tightness/tender points, TMJ hypomobility, and mouth opening limitation. PTs should aim to reduce pain and improve jaw functions. In addition, in patient education, behavioral modifications, several modalities, and therapeutic procedures should be involved [34]. In this study, the most commonly used interventions were therapeutic exercise, manual therapy, and patient education. Muscle training and manual therapy have been proven to restore muscle balance, alleviate pain, and increase mandibular range of motion [27]. Additionally, the participants showed awareness of most of the signs and symptoms of TMDs, except for parafunctional habits. Parafunctional habits such as bruxism are associated with TMDs [32, 35]. Therefore, PTs essentially consider intraoral evaluation with individuals with TMDs looking for tooth wear and bite marks on the tongue or cheeks.

Study limitation

First, the survey was an online open survey using Google Forms. Thus, the participants could submit the questionnaire more than once. However, there was a statement that said, "Please submit once." Furthermore, the online questionnaire is restricted to physical therapists who are interested in social media. Second, the results should not be generalized because of the small sample size and rate response. Additionally, due to the lack of external validity of the questionnaire, the findings should be interpreted with caution. Despite these limitations, this study sheds light on the perception of PT regarding the management of TMDs in Saudi Arabia. Moreover, this study enhances multidisciplinary collaboration between PTs and other

practitioners, particularly dentists. Future research are needed to evaluate TMDs topic in the PT curriculum in PT programs in Saudi Arabia.

Conclusion

This preliminary study showed fair level of knowledge, low confidence, low education, and low clinical experience for PTs in the evaluation and treatment of TMDs in Saudi Arabia. However, PTs showed a good level of the awareness of the TMDs signs and symptoms. PTs must be able to evaluate and treat individuals with TMDs. More attention to PT education programs and post-graduate continuing education courses on TMDs should be pursued. Additionally, PTs should be aware of the multi-disciplinary approaches to provide better services to individuals with TMDs.

Abbreviations

TMJ	Temporomandibular joint
TMDs	Temporomandibular disorders
USA	United States of America
SA	Saudi Arabia
PTs	Physical therapists
PT	Physical therapy
SPSS	Statistical Package for Social Sciences
SD	Standard deviation
<i>n</i>	Total number
%	Percentage
<i>f</i>	Frequency

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s43161-022-00117-4>.

Additional file 1. Survey.

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Authors' contributions

SA designed, analyzed, interpreted the results, and wrote the manuscript. TF, FS, AA, and SA designed the questionnaire, collected the data, and wrote the literature review. MA interpreted the data and wrote the results and discussion. All authors read and approved the final manuscript.

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Availability of data and materials

Datasets analysis will be available from the corresponding author upon reasonable request after publication of the trial findings.

Declarations

Ethics approval and consent to participate

The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the Institutional Review Board (or Ethics Committee) of Ministry of Health (protocol code 1443-1167638 and date of approval 31 January, 2022). Informed consent was obtained from all subjects involved in the study.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no conflict of interest.

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