Article

Opinions of physiotherapy students about disorders of the temporomandibular joint

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ABSTRACT

The presence of occlusion in TMD was a significant factor associated with parafunctional movements, displacement of the articular disc, osteoarthritis, physiotherapy, and problems with the cervical spine. This finding confirms occlusion as a crucial element in the etiology of TMD, which implies the need for careful consideration of this factor in diagnosis and treatment. Physiotherapy students emphasized the need for the use of non-steroidal anti-inflammatory drugs (NSAIDs) in the context of stress and musculoskeletal problems, highlighting the importance of these drugs in alleviating symptoms associated with TMD. Advanced stages of TMD also require more complicated treatment approaches, which is confirmed by the negative correlation with the effectiveness of physiotherapy in these stages. It implies the need for more advanced therapeutic methods and technologies in treating patients with severe forms of TMD. Physiotherapy plays a significant role in treating musculoskeletal problems, including TMD. Its importance lies in its ability to reduce pain, improve joint functionality, and increase general quality of life. These results emphasize the need for an integrated approach in which physiotherapy is central to a comprehensive TMD treatment plan. The research results provide important guidelines for further research and clinical practice, directing experts towards a holistic and individualized approach in the diagnosis and therapy of temporomandibular disorders.

KEYWORDS: physiotherapy; physiotherapist; temporomandibular disorders; temporomandibular joint

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INTRODUCTION

The temporomandibular joint (TMJ) is a joint that connects the lower jaw to the skull on both sides of the head. This joint is formed by the joint of the lower jaw and the temporal bones of the skull. It is located anteriorly from the tragus of the ear, on the side of the face. TMJ consists of joints between three surfaces: the mandibular fossa and the articular cusp (from the squamous part of the temporal bone) and the head of the lower jaw. This joint has a unique mechanism: the articular surfaces of the bones never come into contact with each other because they are separated by an articular disc. The presence of such a disc divides the joint into two synovial articular cavities, each of which is lined with a synovial membrane. The articular surface of the bones is covered with fibro-cartilage rather than hyaline cartilage (1).

The TMJ is a complex structure that allows a variety of movements necessary for jaw function. It

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is made up of several important elements, including ligaments, movements, and neurovascular supply, which together provide stability, flexibility, and sensitivity to this important joint of the human body (1).

Temporomandibular disorders (TMD) are a significant public health problem affecting approximately 5 to 12% of the total population and are considered the most common cause of chronic pain of nondental origin in the orofacial area, causing pain, dysfunction and limitations in jaw mobility. The disorders can be classified into two subgroups: those of articular origin, in which the signs and symptoms are associated with TMJ, and those of muscular origin, when the signs and symptoms are associated with the stomatognathic musculature (2).

Treatment for TMD requires a careful approach that depends on multiple factors, including the cause of the problem and the severity of the symptoms. Healthcare professionals usually start with non-invasive options such as medication or non-surgical therapies before the need for surgery is eventually considered (3).

Non-surgical treatments include wearing mouthguards or oral splints that can position the jaw in a more favorable position or reduce the effects of squeaking and squeezing. Physiotherapy can include exercises to strengthen the muscles around the jaw and stretch the jaw itself. Injections are also administered in the so-called trigger points in painful muscle nodes in the jaw, often with the use of corticosteroids or botulinum toxin. Other methods include ultrasound therapy, which uses sound waves to deepen heat into tissues and promote muscle relaxation, and transcutaneous electrical nerve stimulation (TENS), which uses low electrical currents to relax the jaw muscles. Behavioral changes, such as improving posture or avoiding chewing ice, also help reduce symptoms (3).

Physiotherapy plays a crucial role in the treatment of TMD, providing a variety of therapeutic methods that can significantly alleviate symptoms and improve joint functionality. One of the basic techniques is manual therapy, which includes manual techniques of physiotherapists aimed at mobilizing joints, stretching and massaging muscles and soft tissues. These techniques reduce muscle tension, improve circulation, and restore normal joint mobility, thereby reducing pain and speeding up the recovery process (4).

The opinion of physiotherapy students, as part of a multidisciplinary healthcare team involved in the treatment of patients with TMD, is crucial for understanding their readiness to cope with the challenges that TMDs bring to clinical practice.

The aim of the study is to determine the attitudes of physiotherapy students towards temporomandibular disorders.

SUBJECTS AND METHODS

The research conducted for the purposes of this thesis involved 82 students of physiotherapy at the Faculty of Dental Medicine and Health of the Josip Juraj Strossmayer University of Osijek. The criteria for participation were that the participants were physiotherapy students and that they expressed their willingness to participate in the study.

For the purposes of this study, the data were collected in a survey conducted in May and June 2024. The survey, which was specially designed for this research, was made available to respondents via the Google Forms platform. This method allows the collection of quantitative data on the attitudes, opinions, preferences or behavior of the respondents. One of the main advantages of a survey is the ability to collect data from a large number of respondents in a short period of time, which allows researchers to obtain a representative sample of the population and gain insight into general opinions or trends.

Respondents answered questions from the questionnaire using a Likert scale from 1 to 5, where 1 indicated "disagree at all" and 5 "strongly agree" (Table 1).

The statistical program SPSS (version 25, SPSS Inc., Chicago, Illinois, USA) was used for statistical data processing, and statistical significance (P) less than 0.05 is considered significant. The data collected by the research were analyzed by the descriptive method, Spearman's correlation coefficient, and the differences between socio-demographic groups were analyzed by the Student's t-test and one-way analysis of variance (ANOVA).

RESULTS

82 physiotherapy students from the Faculty of Dental Medicine and Health in Osijek participated in the research. Participants in the study were randomly selected and invited to participate in the study by email. The study involved 49 women (59.8% of respondents) and 33 men (40.2% of respondents).

From the analyzed data, it is observed that there is no statistically significant difference between

Table 1. Cronbach Alpha Coefficient of the "Temporomandibular Disorders" Measurement Scale.

Total Cronbach alpha coefficient = 0.789				
	Average value	Scale variance	Corrected Item – Overall Correlation	Cronbach's alpha
1. The presence of occlusion is an important factor in the etiology of temporomandibular disorders.	47.33	34.569	0.496	0.650
2. Parafunctional movements (opposite to physiological movements) promote problems in the temporomandibular joint.	47.28	34.871	0.347	0.767
3. Nonsteroidal anti-inflammatory drugs help with pain in the temporomandibular joint.	47.27	36.026	0.337	0.669
4. Stress is a very important factor in the development of temporomandibular disorders.	47.09	36.326	0.320	0.771
5. Crepitation/clicking/creaking in the temporomandibular joint is a symptom that can cause pain.	46.89	35.012	0.460	0.754
6. Articular disc displacement and osteoarthritis are the most common forms of temporomandibular disorders.	47.43	35.285	0.328	0.770
7. The stationary part of the joint has its influence on the function of the temporomandibular joint.	47.40	36.046	0.340	0.669
8. Temporomandibular disorder of a traumatic nature is more complicated than a general disorder.	47.35	33.466	0.490	0.746
9. Crepitations in the temporomandibular joint are most often muscular in nature.	47.90	37.003	0.216	0.685
10. Crepitation/clicking/squeaking in the presence of pain is an advanced stage of temporomandibular disorder.	47.24	37.322	0.241	0.681
11. Physiotherapy is the best option for treating temporomandibular disorders.	47.67	37.508	0.189	0.788
12. Temporomandibular disorders are due to musculoskeletal problems.	47.24	37.866	0.173	0.690
13. Temporomandibular disorders are associated with the cervical spine.	47.68	37.034	0.211	0.786
14. Age is associated with the onset of temporomandibular disorders.	47.85	37.015	0.172	0.794

men and women in the analyzed attitudes about problems with the temporomandibular joint, except for the variable "Crepitation/clicking/squeaking in the temporomandibular joint is a symptom that can cause pain" ($t = -2.107$, $df = 78$, $P = 0.038$).

Analysis of data (ANOVA test) by age of the subjects did not show statistically significant differences in the attitudes of the subjects towards temporomandibular joint disorders ($P > 0.05$).

The results show statistically significant differences in attitudes towards age groups for the variables "Articular disc displacement and osteoarthritis are the most common forms of temporomandibular disorders" ($F(4, 77) = 3.728$, $P = 0.008$), "The immobile part of the joint has an impact on the function of the temporomandibular joint" ($F(4, 77) = 2.860$, $P = 0.029$) and "Temporomandibular disorder of a traumatic nature is more complicated than a general disorder" ($F(4, 77) = 4.638$, $P = 0.002$).

These variables show that respondents of different age groups have different attitudes towards these specific aspects of TMD. Therefore, in the continuation of the analysis, Tukey's test of subsequent analysis determined between which age groups there are differences in these attitudes.

There is a statistically significant difference in the attitudes of respondents between the 2nd year of undergraduate and 1st year of graduate study ($P = 0.010$) and the 2nd year of undergraduate and 2nd year of graduate study ($P = 0.045$), in the opinion that articular disc displacement and osteoarthritis are the most common forms of temporomandibular disorders.

There is also a statistically significant difference in the attitudes of respondents in the 2nd and 3rd year of undergraduate studies that the stationary part of the joint has its influence on the function of the temporomandibular joint.

Also, a statistically significant difference was found between the subjects in the 2nd year of undergraduate and 1st year of graduate study ($P = 0.031$), in the 2nd year of undergraduate and 2nd year of graduate study ($P = 0.008$) and in the 1st year of undergraduate and 2nd year of graduate study ($P = 0.033$) in the view that temporomandibular disorder of a traumatic nature is more complicated than a general disorder.

DISCUSSION

TMDs have an increasingly important place in the professional and scientific literature. A study conducted by Dhakshinya and Kumar (2021) showed a good level of dentists' knowledge of TMDs, while dental students showed a moderate level of knowledge. Dental specialists showed a higher level of knowledge compared to general practice dentists, and postgraduate students were better informed than undergraduate and specialist students. Both groups, both dentists and students, showed a positive attitude towards upgrading knowledge and managing TMDs. However, general practice dentists and dental students have shown a lack of confidence and difficulty treating TMD patients in their practice. On the other hand, dental specialists have demonstrated excellent clinical practices for patients with TMDs. These results highlight the need for improved education in the curriculum for dental students regarding TMDs (5).

A study conducted by Samejo, Lasi, Mehmood, Saleem, and Waseem highlighted the need for TMJ specialists to deal with TMD patients. General practice dentists in India have shown a low level of knowledge about the physio-therapeutic benefits of TMJ as well as very little confidence in diagnosing and treating patients with TMDs (6).

The aim of the study conducted by Hussein, Alaymi, Aharbi et al. was to assess dentists' knowledge of the role of physiotherapy in the treatment of TMD. The majority of respondents stated that they do not refer their patients to physiotherapy because they are not aware of its importance in managing TMDs, while the remaining respondents believed that patients did not need physiotherapy (7).

Shaheen, Alhajri, Alrajeeb, Almoammar, Alyousef et al. in their research, they came to the realization that dentists believe that physical therapists treat TMJ in the same way as other joints in the body. In doing so, they use various electrotherapy modalities, including electrical stimulation, ultrasound, laser therapy, and acupuncture, to reduce discomfort and inflammation, which further promotes tissue recovery. To restore proper flexibility and muscle length/strength, they use other conservative methods such as occlusal splint therapy, manual therapy, therapeutic exercises, and at-home exercise programs. As a result, joint mobility and function are improved and pain is reduced (8).

An analysis of data from multiple studies on physiotherapy interventions for the treatment of TMD showed significant results in improving mobility and reducing pain. A study by Gawade Shinda and Jamala showed that early physiotherapy intervention can significantly improve the mobility of the temporomandibular joint and reduce pain. This research highlights the importance of starting

physiotherapy early to achieve the best possible outcomes for patients (9).

Furthermore, a study by Nambi and Abdelbasset, which included the application of the Maitland method of joint mobilization and a therapeutic exercise program, showed positive results in the treatment of TMD in patients with cervicofacial burns. The combination of these methods led to a reduction in pain, an improvement in range of motion and an increase in quality of life (10).

Piech et al. found that manual therapy and masticatory muscle exercises can reduce pain and improve range of motion in patients with TMJ hypomobility (11). Similarly, Gürsoy et al. They have also shown that manual therapy can reduce morning and meal soreness and improve range of motion (4).

Research by Shaheen et al. indicated a lack of awareness among dentists about the benefits of physiotherapy in the treatment of TMD, although most were aware of its role. This research highlights the need to better educate dentists about a multidisciplinary approach to the treatment of these disorders (8).

In their 2019 study, Pundkar, Patil, and Naqvi highlighted the effectiveness of Rocabado exercises and TENS therapy in reducing pain and improving TMJ function. Also, Ghodrati et al. have shown that adding TMJ treatment to routine neck physiotherapy can increase the effectiveness of interventions (12).

Aggarwal et al. have shown that myofascial relaxation in combination with NSAIDs can improve TMJ motility and function in patients with neck pain. Practical experience confirms the effectiveness of myofascial relaxation in improving the function and increasing the mobility of the TMJ (13).

A review paper by Dragomir et al. recommends starting with conservative treatment of TMD due to a lower risk of side effects. Physical therapy shows high success in the treatment of various TMDs, which has been confirmed in the literature (14).

All these studies confirm that various physiotherapy methods, including manual therapy, exercises, TENS and laser therapy can effectively reduce pain and improve function in patients with TMD. However, further research is needed to determine best practices and protocols for treating these disorders.

Given the importance of knowing TMJ disorders and how to treat them, the results of the research conducted for the purposes of this thesis provided significant insights into the connection between various factors and TMD and thus suggest the complexity of the etiology and treatment of these disorders.

One of the key findings is the significant association of the presence of occlusion with most of the variables analyzed, including parafunctional movements, articular disc displacement, osteoarthritis, physiotherapy and cervical spine. The results suggest that occlusion plays a key role in the etiology of TMD. This is consistent with previous research that has identified malocclusion as an important risk factor for developing these disorders. Likewise, the stress that is often caused or exacerbated by the painful symptoms of TMD can further worsen the condition of patients. The results of the conducted research show that crepitation/clicking are strongly associated with a stationary part of the joint and a traumatic disorder, which emphasizes their importance as symptoms that may indicate more serious damage within the joint.

Articular disc displacement and osteoarthritis have shown a significant association with age, suggesting that these forms of the disorder occur more often in the elderly. This is important because older patients may require specific treatment approaches that take into account their general health picture and the presence of other chronic conditions. Furthermore, the immobile part of the joint has shown a significant association with the traumatic disorder, which emphasizes the importance of joint functionality in the prevention and treatment of these disorders. Traumatic disorders, which often result in more complex clinical pictures, show a significant association with the advanced stage of the disorder, which indicates challenges in their treatment. Also, physiotherapy has shown a positive correlation with musculoskeletal problems, which highlights its importance in managing these problems and improving the functionality of the joint.

The results highlight the complexity of TMDs and the importance of a multidisciplinary approach in their treatment. Collaboration between dental professionals, physical therapists, and other healthcare professionals is essential to achieve better outcomes for patients. The findings further point to the need for continuous educational programs to ensure that all healthcare professionals are aware of the latest research and practices in the treatment of TMD.

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